

30 March 2015

**MINUTES OF THE AFC WINTER MEETING 2015
 10-11 March 2015, Melbourne, Florida**

1. OPENING REMARKS AND INTRODUCTIONS

Terry Gambill (PHI) convened the Aeronautical Frequency Committee (AFC) meeting on 10 March 2015 at the Harris Customer Center, Melbourne, Florida.

All members introduced themselves to the group.

Attendees:

Ken Adams (DAL)	Kelly O’Keefe (Access Partnership)
Greg Bourey (ASRI)	Tim Pawlowitz, (FAA)
Vytas Cerniauskas (ASA Alternate/FFT)	Tim Payne (DAL)
Chris Collings (Harris)	Barry Pilkinton (FDX)
Bob Dick (ACG Systems)	Holly Rees (ASRI)
Terry Gambill (PHI) - Chairman	Brian Romine (USA/AAL)
Dr. Michael Garcia (Aireon)	Andrew Roy (ASRI) – Executive Secretary
Michael Hinojosa (ASRI)	John Seybold (Harris)
Terry Horn (SITA)	Tim Totten (UPS)
Kris Hutchison (ASRI)	Tom Wainscott (FDX)
Joseph James (Harris)	Joe Williamson (JBU)
Steve Ledger (Rockwell Collins/ARINC)	Neal Young (SWA)
Vic Nagowski (ASRI)	

Apologies:

Joe Cramer (Boeing)	Jeff Monroe (ASA)
Tom Davis (DAL)	John Monto (Rockwell Collins/ARINC)
Rich Farr (AAL)	Mike Richards (AAL)
Michael Francis (NATA)	Dave Robinson (ERA)
Mark Hagan (UPS)	Pete Talbot (Nav-Tel Services)
Pete Incaini (UAL)	Frank Watts (SITA)
Zbig Jasiukajc (SITA)	David York (HAI)
Chris Kelly (UAL)	

The current AFC membership, associate members and observers' status (**Document 01**) was reviewed by Andrew Roy (ASRI). Voting members in attendance were accounted for and the voting procedure including proxy voting was reviewed. He also noted that other prospective members are always being considered for future membership, and the membership was encouraged to nominate suitable organizations.

Before beginning the meeting, Andrew requested that all AFC members respect the ownership of the information being presented, and seek permission from the respective authors before distributing outside the AFC.

2. APPROVAL OF THE AGENDA

The agenda (**Document 02**) was reviewed and approved as discussed.

3. APPROVAL OF THE FALL 2014 MEETING MINUTES

Terry Gambill (PHI) – The AFC Chairman introduced the minutes from the Fall 2014 AFC meeting and the group conducted a page-by-page review.

There was a comment that references to the FAA should be more specific to the office within the FAA to avoid confusion.

Terry announced that the minutes were approved as modified.

4. REPORT OF RELATED ACTIVITIES

A) International Telecommunications Union-Radiocommunications (ITU-R) Activities

(i) Study Group 5 (WP 5A and WP 5B)

Kris Hutchison (ASRI) provided the report on Working Parties 5A and 5B (WP 5A & WP 5B) within ITU-R Study Group 5 (SG 5).

Kris reported that WP 5B group is the primary focus for ASRI given its lead for aviation and radar issues in the ITU-R. Given the impending WRC-15 meeting scheduled for Nov 2015, WP 5B has been very active finalizing reports and recommendations for the conference. These areas include use of satellites for UAVs, Wireless Avionics Networks (WAIC), ADS-B over satellite, Global Flight Tracking (GFT), and interference from wired telecommunication standards to HF and VHF systems. It was noted that WAIC is going well, but UAVs and ADS-B/GFT look likely to be contentious issues at the future WP 5B meetings and WRC-15, with both topics having strong opposing views at the ITU-R. The new wired telecommunication standards are being dealt with in the ITU-T, who have not been very receptive to WP 5B's concerns on the development and potential interference.

Although not a normal focus, WP 5A's agenda item 1.4 deals with the allocation of the amateur radio spectrum on a secondary basis in the band 5250 – 5450 KHz. This spectrum is directly below the aeronautical band with raises concerns with amateur radio interfering with the aeronautical receive sites. A guard band was originally being considered, however this has now been removed by the systems proponents. More work is expected in this area at the next meeting.

The next meeting for Study Group 5 and its working parties is scheduled for the 6-17 July 2015 in Bucharest, Romania. However, a special WP 5B meeting is planned to be held on the 10-15 May 2015 solely for ADS-B over satellite and GFT.

(ii) US FCC Preparation Groups for WRC-15

Kris Hutchison (ASRI) provided a report on the FCC's Preparatory Group for WRC-15. The Federal Advisory Committee's work for the FCC is almost complete, with some additional meetings being scheduled to review the C-Band FSS satellite links. This has been hard fought between the satellite industry, and IMT proponents seeking additional spectrum

(iii) Global Flight Tracking

Kris Hutchison (ASRI) provided a report on the Global Flight Tracking.

An ICAO Global Tracking of Aircraft briefing (**Document 4A3**) in support of the ICAO Aeronautical Spectrum Workshop held in Cairo, Egypt in February 2015 was presented by Kris.

Draft Annex 6 SARPs in preparation regarding flight tracking have proposed:

- Tracking is defined as a 4D function by aircraft operators (airlines), updating a minimum of every 15 minutes.
- Options to increase update rate to 1 minute tracking based on a triggered event
- Future considerations for data recovery and automatically deployable flight recorders

The ICAO second meeting of the High-Level Safety Conference (HLSC) was held February 2-5, 2015. The major themes included reviewing the current situation with GFT, the future approach to manage aviation safety, and facilitating increased regional cooperation. Emerging safety issues include global tracking of aircraft and the risks to civil aviation from conflict zones. The conference recommended that ICAO should encourage States and the ITU to discuss allocation requirements at the WRC-15 to provide the necessary spectrum allocations for global air traffic services surveillance as a matter of urgency.

ICAO and IATA recently held a meeting on May 12-13, 2014 to develop a position regarding flight tracking. The conclusions of this joint meeting were taken to another ITU meeting that was held in Malaysia on May 26-27, 2014 to address GFT by operators. The satellite communication providers and avionics manufacturers are supporting these meetings and offering some flight tracking options in remote areas to the industry. It is expected that ICAO will continue to work the issue and coordinate with the ITU if new spectrum is required in the future. This item will be considered at the WRC-15 meeting.

B) ICAO Aeronautical Communications Panel (ACP) Activities Report

(i) Working Group F (WG-F).

A presentation (**Document 4B1**) was provided by Andrew Roy (ASRI) on WG-F.

The last WG-F meeting was held February 16-25 2015 in Cairo, Egypt. It was the last meeting with WG-F as a standalone working group, as the reorganization within ICAO has resulted in WG-F becoming part of the newly formed Frequency Spectrum Management Panel (FSMP). ASRI has been invited to be a panel member in addition to administrations and global organizations such as IATA.

The primary focus was finalizing the ICAO position for WRC-15. Agenda items relevant to ICAO included:

- 1.1 New IMT allocations
- 1.5 Fixed Satellite Service (FSS) use of UAS
- 1.17 Wireless networks for avionics (WAIC)
- 1.18 Automotive radar (proposed for aircraft ground maneuvering - advisory only)
- Removal of redundant footnotes, future agenda items; and the new GFT agenda item

Other topics include the draft EuroControl spectrum strategy, 5 GHz band planning (UAS and AeroMACS), radio altimeter protection, and a concept for rationalization of aircraft RF communication systems.

The ICAO position is now ready for state approval. The IATA position is being drafted and the AFC position will be discussed at the next AFC meeting. The next meeting of FSMP is scheduled for 24-28 August 2015 in Montreal, Canada.

(ii) Working Group M (SELCAL).

A presentation (**Document 4B2**) was provided by Vic Nagowski (ASRI Contractor) on WG-M related to the selective calling (SELCAL) code pool expansion update.

The ICAO Communications Panel Meeting 1 was held December 1-5, 2014 in Montreal, Canada. Boeing/Airbus submitted a working paper with concerns that were addressed by ASRI at the meeting except for the completion of testing of avionics for backward compatibility. IATA also expressed concern about avionics backward compatibility testing. The meeting concluded that testing for backward compatibility was required so the SELCAL code pool expansion proposal was deferred until the next ICAO approval cycle commencing in 2016 (with SARPs following in 2018).

The second meeting of the AEEC SELCAL Working Group (WG) was held on December 9, 2014 in Seattle, WA hosted by Boeing. The third meeting of the SELCAL WG was held on March 3, 2015 in Paris, France hosted by Cobham. Work continued on drafting the SELCAL standard (714A) and as a result of the WG meeting, an update draft 714A was produced. The

next meeting of the SELCAL WG is scheduled for July 7, 2015 at RTCA Headquarters in Washington, DC. Completion and approval of the 714A is on schedule for later this year.

The third meeting of RTCA SC-232 was held March 3-4, 2015 in Paris, France hosted by ASRI. The meeting was held in conjunction with AEEC SELCAL WG. The primary objective was to continue to development of the MOPS and reviewed the results of avionics testing for backward compatibility. The avionics testing results presented for backward compatibility has been favorable. The fourth meeting of SC-232 is scheduled July 8-9, 2015 in Washington, DC at RTCA Headquarters. The primary objective will be to continue to development of the MOPS and status the avionics testing for backward compatibility. This meeting will be held in conjunction with AEEC SELCAL WG.

(iii) Working Group S (WG-S).

A presentation (**Document 4B3**) was provided by Vic Nagowski (ASRI Contractor) on WG-S.

ICAO WG-S is an ICAO sponsored initiative to develop standards for the AeroMACS system. The WG-S objectives include the development of the System and Recommended Practices (SARPs) standard, the Technical Manual (TM), and coordination with other committees as necessary.

The ICAO WG-S held its sixth meeting on November 13-14, 2014 in Sendai, Japan. Work accomplished included:

- Reviewed the status of relevant work programs
- Finalize the proposed ICAO SARPS
- Reviewed the performance of the ENRI AeroMACS prototypes
- Reviewed the AeroMACS draft SARPS

The draft AeroMACS technical manual was reviewed at the meeting with a completion date scheduled for the end of 2015. The next meeting of WG-S is scheduled for March 17-19, 2015 in Montreal, Canada.

The AEEC System Architecture and Interface (SAI) Subcommittee is leading the AeroMACS architecture effort. Phase 1 involves defining an architecture and phase 2 will develop the system design including the system components. Six possible architectures for airborne radios, antennas, gateways, routers, etc. have been proposed and are being considered by the SAI committee. The airlines are also addressing various issues such as funding, benefits, security, and schedule.

The next SAI meeting is scheduled for June 23-25, 2015 in Frankfurt, Germany hosted by Lufthansa.

RTCA SC-223 has completed its work program and EUROCAE WG-82 is continuing with the development of a Minimum Aviation System Performance Standard (MASPS) and ground equipment MOPS.

(iv) European Frequency Management Group (FMG).

A presentation (**Document 4B4**) was provided by Andrew Roy (ASRI) on the FMG.

The FMG normally meets twice a year, and the last meeting was held on December 3-5, 2014 in Brussels, Belgium. Topics relevant to US aviation included:

- VDL Mode 2 frequency allocation proposal
- 117.975 – 137 MHz on adjacent frequencies
- Frequency for ADS-B reception via LEO satellites
- The FMG agreed to temporarily assign ARINC frequency 136.875 for on ground use only in Europe
- The ARINC requested changes to the FMG VDL frequency reallocation plan and the FMG band plan will not be changed until the EU single European skies studies are complete
- As a result of the EuroControl studies, the FMG has proposed changes to adjacent channel criteria for systems in the 117.975-137 MHz band
- The FMG suggested that the frequency allocation for ADS-B reception be on 1090 MHz in support of global flight tracking of aircraft

The next meeting of the FMG is scheduled for 7-11 September 2015 in Paris, France.

C) FAA REPORT

(i) FAA DataComm Program

Tim Pawlowitz, FAA Spectrum Office, provided a presentation (**Document 4C1**) on DataComm, Automatic Dependent Surveillance – Broadcast (ADS-B), AeroMACS, and the Use of PED's on Aircraft.

The FAA's Spectrum Office is concerned that if maximum spectrum efficiency is not realized during the earliest implementation of the DataComm program, improving spectrum efficiency later in the program will not be possible. Additionally, the FAA Spectrum Office wanted clarification that the message traffic carried by DataComm in the AOC and ATS spectrum is in conformance with the FCC rules.

The FAA initially contacted the FCC to ask for an interpretation of the existing rules for both ATS and AOC communications. The FCC informally advised that some work may be required to ensure the existing rules are suitable, however it should be industry submitting the request formally to the FCC before this can be confirmed.

Chris Collings, Harris, on behalf of the FAA DataComm office, provided an overview (**Document 4C2**) of the FAA Data Communications program which will provide data communications between the cockpit and controllers to replace some of the current voice communications. A service strategy roadmap was provided. Several program phases have been defined including initial departure clearance (DCL) tower service (Segment 1 Phase 1 – S1P1), initial enroute services and follow-on enroute services (Segment 1 Phase 2 – S1P2), and advanced

trajectory services (Segment 2). The S1P1 baseline milestones were reviewed and the program is currently on track.

The current DataComm accomplishments include:

- Controller Pilot Data Link Communications (CPDLC) Departure Clearance (DCL) trials at Memphis (MEM) and Newark (EWR) extended through January 2016;
- Final Investment Decision (FID) completed for initial enroute services; and
- Departure Clearance (DCL) tower service formal integration and test started in December 2014 and operational test and evaluation (OT&E) to start in February 2015.
- The tower service (S1P1) software development is complete.
- The Enroute Automation Modernization (ERAM) DataComm release went operational with DataComm in August 2014. The hardware, installation, integration, and test was completed at Salt Lake City (ZLC) and Atlanta (ZTL) in June 2014. Engineering efforts were started on ERAM enhancements to support enroute (S1P2) initial services.
- Coordination with air carriers to support test and deployment is continuing which includes aircrew training, updating advisory circulars, and upgrading the dispatch automation systems to support the DataComm interface.
- There is also work on the clarification of the flight data recorder rule.

ACARS is planned to be part of DataComm only for non-time critical applications such as departure clearances. Although it has been requested by several operators, the data being collected thus far by the trials indicates that the POA will not support enroute services performance requirements. The FAA will rely on the FAA Performance-based Operations Aviation Rulemaking Committee (PARC) Communications Working Group (CWG) to define the VHF CPDLC performance requirements for the use of ACARS for enroute services.

(ii) ADS-B Implementation Progress and Future intentions (Terrestrial and SATCOM).

Tim Pawlowitz, FAA Spectrum Office provided an update on the ADS-B implementation progress and future intentions.

Several charts illustrating the ADS-B enroute and terminal area ground station implementation as of September 2014 were provided. In addition, charts for the available ADS-B avionics as of April 2014 were also provided. The FAA is taking a wait and see approach concerning the future intentions of using SATCOM for ADS-B.

(iii) Authorization of Cellphones on Aircraft.

Tim Pawlowitz, FAA Spectrum Office provided an update on the authorization of cellphones on aircraft.

An update on the FAA's involvement /position on the use of PED's on aircraft was not available before this meeting. The FAA is supporting the certification of airframes to use PED's.

A September 13, 2014 article in USA TODAY cited that the FAA is ordering replacement of cockpit displays on Boeing 737 and 777 because of concerns about Wi-Fi interference. If the

FCC lifts its ban on cellular service on planes, the Transportation Department will consider whether to regulate the use of cellular phones on aircraft.

(iv) FAA's AeroMACS Deployment Update.

Tim Pawlowitz, FAA Spectrum Office provided an update on AeroMACS.

The FAA is waiting on the FCC commissioners' office decision release which adds an AM(R)S allocation to 5091-5150 MHz band thereby enabling AEROMACS. The FAA has asked if the FCC has a tentative release date but the implementation document is not high on the FCC's priority list. Once the implementation document is released, work can commence to include AEROMACS in the FCC rules. The WIMAX forum is looking to take the lead to make this happen.

D) FCC Updates

(i) FCC Order & Authorization on LightSquared.

Andrew Roy (ASRI) provided a presentation (**Document 4D1**) on LightSquared.

A summary of the history of LightSquared and the FCC was provided, noting that it has still not been conclusively proven to be compatible with GPS according to FAA and the National Space-Based Positioning, Navigation and Timing Systems Engineering Forum (NPEF) reports.

LightSquared is continuing to struggle after the FCC delays and is seeking bankruptcy exit on \$1.7bn of debt. The legal case between Harbinger, existing shareholders, and Ergen is continuing. There is also a power struggle between shareholders and a competitor (Charlie Ergen) who had acquired \$1bn of the debt. Harbinger attempted to sue GPS IC for \$1.9bn claiming GPS manufacturers were 'not forthcoming' on GPS receiver performance. A judge rejected most claims on 5 February 2015. Still left open is the negligent misrepresentation and constructive fraud. ASRI will continue to monitor and report on the status of this effort.

(ii) AEEC Data Link Users Forum Update

Vic Nagowski (ASRI Contractor) provided a presentation (**Document 4D2**) on the last meeting of the AEEC Data Link Users Forum (DLUF).

The last DLUF meeting was held on February 3-4, 2015 in Panama City, Panama hosted by Copa Airlines. The primary subject of discussion was the FAA Controller Pilot Data Link Communications (CPDLC) program status and the status the CPDLC Operations in Europe data link services implementation rule (DLS IR).

Key items of interest included:

- FAA Data Communications Program update
- Data Communications Integrated Services (DCIS) update
- European Commission Data Link Services Implementing Rule (DLS IR) status

- European Laboratory for Structural Assessment (ELSA) consortium was formed to investigate the root cause of the ATN performance issues and developing recommendations for system improvements in Europe.

The next DLUF meeting is scheduled for September 15-16, 2015 in Toulouse, France hosted by Airbus. An airline only roundtable meeting is scheduled for September 17, 2015 to review the previous meeting results and identify items for discussion at the next DLUF meeting.

(iii) Wi-Fi Blocking Enforcement Action by FCC

Tim Totten (UPS) provided an update of Wi-Fi Blocking Enforcement Action by the FCC.

The FCC took action on Wi-Fi blocking mechanisms after a hotel chain was implicated in forcing customers to use the hotel Wi-Fi system by blocking user created hotspots. The blocking was at the protocol level using the 802.11 standard's deauthorization messages, and not the RF level. The FCC enforcement bureau stated in a public notice that any companies engaged in Wi-Fi blocking by refusing verification of authentication are violating Section 333 of the Communications Act. However, concern was expressed that this was too general, and prevented use of Wi-Fi Intrusion Prevention System (WIPS) protocols in 802.11 to legitimately protect and maintain business networks.

Tim mentioned that the industry needed to request that the FCC provide more clarification on what is allowed, and not allowed, regarding Wi-Fi blocking.

(iv) FCC Receiver Standards Proposal

Andrew Roy (ASRI) provided a presentation (**Document 4D4**) on the FCC Receiver Standards Proposal.

Andrew provided an update on the initiative from the FCC's Technical Advisory Council (TAC), providing some background on the concept and where it currently stood.

The FCC is planning to implement a pilot multi-stakeholder group investigating certain bands in the 3.4 - 3.6 GHz range as part of the 3.5 GHz NPRM. A test is scheduled over the next year and the results will then be reviewed. The results could potentially be applied to other frequency bands of interest. The ASRI staff will continue to monitor and report on the status of this effort.

(v) C-Band Coalition Work with FCC and NTIA

Kris Hutchison (ASRI) provided a report on the C-Band Coalition Work with the FCC and NTIA.

The C-Band coalition is an ad-hoc group of various organizations and mutual interests attempting to protect the FSS VSATS in the 3400-4200 MHz band from new IMT allocations worldwide. Aviation uses these bands for rear link connectivity for ATM backhaul and Inmarsat satellite feederlinks. A number of studies have been conducted domestically, and in the ITU-R,

that have shown that VSATS and IMT systems cannot co-exist in the same spectrum without several hundred miles of separation. The coalition was established to help influence US domestic policy, as this was seen to be favorable to IMT operating in the band. The C-band spectrum is one band that the IMT proponents would like to obtain and this spectrum will be considered further at the WRC-15 meeting.

(vi) FCC Forfeitures

Michael Hinojosa (ASRI) briefed on the FCC Forfeitures.

Mike provided the history associated with a couple of interference issues being written up by the local FCC representative with radios owned by both American and Hawaiian airlines in Hawaii. ASRI staff worked with the local FCC representative and the airline management to resolve the issues and educate the airlines on how to handle such interference issues in the future.

Interference issues in the future should be reported through the ASRI website via the on-line interference report. ASRI stated that they will work with the organization to isolate and resolve the interference issue, but noted that any fines levied by the FCC for violations due to customer actions will be passed onto the respective customer as noted in ASRI's contracts. These can range from \$10k to several million dollars depending on the violation, and the FCC's intent at the time.

5. AIREON COMPATIBILITY ANALYSIS

Dr. Michael Garcia of Aireon, provided a presentation (**Document 5**) on the Aireon Compatibility Analysis.

Iridium NEXT is the program to replace the existing Iridium satellite constellation starting later in 2015. A \$3B US/Canadian/European satellite project was commissioned by Iridium and built by ThalesAlenia Space in France. The space-qualified ADS-B receiver payload was developed by Harris Corporation and will operate in a 72 LEO satellite constellation with 9 ground spares. Systems engineering and the ground data processing system is being provided by Exelis. The Iridium NEXT system is planned to be fully deployed in 2018.

Mike provide a detailed schedule which highlighted technology, safety, an implementation plan, and regulatory milestones (CONOPS is planned for 2018). A new Memorandum of Agreement (MOA) between the FAA and Aireon was signed in October 2014 covering the period through FY2018 and will include key activities of:

- Design and development
- Integration into the surveillance and broadcast services system
- Test and validation
- Operational procedures development
- Safety case development and international coordination
- Integration with and modifications to the Advanced Technologies and Oceanic Procedures (ATOP) system
- Business model development

The FAA and Aireon will develop a program plan by February 2015 to achieve the following objectives:

- Begin the necessary preparations to support enhanced separation services in FAA oceanic airspace using Spaced Based ADS-B
- Protects the option for the FAA to begin using spaced-based ADS-B in 2018 with the application of enhanced separation services

Aireon System performance testing validates the ability to support both reduced oceanic and terrestrial separation standards. It is expected with current Aireon models that latency of less than or equal to 2.5 seconds with 95% of the reports being updated in 8-15 seconds with high availability of 99.9% will meet the ICAO GOLD datalink standard.

The Aireon compatibility analysis concluded:

- The assumptions within this model are generally conservative but will need validation/calibration based upon launch and initial data capture
- Compatibility of the Aireon system with current in-band surveillance and other systems has been analytically demonstrated
- Co-primary AMS(R)S allocation in the ITU for aircraft to space-based ADS-B receivers would impose no additional in-band or out-of-band restrictions

A question was asked about the traffic assumptions made for future air traffic growth over the lifetime of the satellite. Aireon replied that they had not yet completed that analysis, but were confident that the system would support the levels of expected traffic.

6. SYSTEMS STATUS

A) Data Link Systems (RC/SITA)

Steve Ledger (Rockwell Collins/ARINC) provided a verbal presentation on the RC/ARINC data link networks.

The Rockwell Collins VHF ground system in the America's in January 2015 processed approx. 47M messages, with traffic increasing by about 15.5% from this same time last year. The VHF uplink message success rate for ACARS is 98.8% and for VDL/AOA it is 98.2%. The VDLM2 system is supporting 5,700 aircraft worldwide, which is more than half the total aircraft being supported. The VDLM2 traffic is approximately 25-30% of the total VHF traffic.

The Inmarsat satellite service has approximately 6000 aircraft equipped, allowing uplink delivery success at 99.2 % and the average block delivery time is 8 seconds roundtrip. The Iridium satellite system uplink message delivery success rate is approximately 96.5%, and the uplink message delivery time is averaging 25.6 seconds.

VDLM2 multi-frequency testing is continuing. Thus far there are 5 stations on the west coast supporting a second VDLM2 frequency test network.

Terry Horn (SITA) provided a presentation (**Document 6A**) on the SITA data link networks.

Terry provided an update on a SITA reorganization announced in January 2015, combining several previous groups within SITA into a single organization called SITA OnAir.

The POA and VDL network expansion worldwide is at a rate of about 70 ground station radios per year, with a rapid expansion of VDL coverage in Europe. A network comparison chart was provided comparing June 2014 and March 2015.

Important developments include an alternate VDL ground frequency trial in Europe, and supporting the EASA project to diagnose the VDL Provider Abort issues in Europe.

B) Radio Station Inspection Programs (ASRI).

Michael Hinojosa (ASRI) gave a short briefing on the status of the 2014 ASRI Radio Station Inspection program (**Document 6B**). There were 1016 inspections completed in 2014. Inspections currently in progress are in New Mexico, Arizona, and California. The goal for 2014 is another 1000 ground stations inspected.

Mike noted that ASRI continues to see the same problems every year, including include additional radios found on frequencies that were not included on the station license, radios licensed that are not being used and need to be decommissioned, transmitters not marked with the licensed frequency, and customers operating on frequencies for which they are not licensed. There were a total of 43 licensed radios that were not being used in 2014. Mike noted that the FCC can issue fines should a radio be found in non-compliance, and ASRI's new spectrum monitoring system should help station inspectors in investigating the RF environment at airports.

C) Station RFI Issues (ASRI).

Michael Hinojosa (ASRI) gave a presentation (**Document 6C**) on all RFI incidents since the Fall 2014 meeting.

Problems identified at MAF, HNL, DEN, ACY, and PHL airports were investigated and corrected. Interference issues are still open at MSY and AFW. There were 24 reported RFI issues received in 2014 with 22 resolved and 2 remain open. A chart illustrating organizations reporting RFI issues and another chart showing RFI solutions observed in 2014 were provided.

ASRI acknowledged the outstanding help received from the FAA ATC Spectrum Engineering Services office, the FCC, the airlines involved, Rockwell Collins/ARINC, and ACG in the resolution of the RFI problems.

7. EXISTING BUSINESS

A) VDLM2 Deployment Plan for Data Comm. (ASRI/RC/SITA/HARRIS)

Andrew Roy (ASRI) provided a presentation (**Document 7A**) on the VDLM2 Deployment Plan.

The AFC channel plan created in 2010 for VDLM2 networks utilizes the upper 136 MHz band with dedicated frequencies for each DSP and options for additional capacity. The analysis conducted by the AFC concluded that a minimum of five 25k guard channels was needed to ensure co-site operation of VDLM2, limiting the upper 136 MHz band to 5 possible channels including the CSC.

Rockwell Collins/ARINC and SITA formally requested additional VDLM2 channels to support increased VDLM2 AOC and traffic and DataComm. Since 2014, ASRI has worked with both DSPs to develop a proposal for adoption by the AFC to assign new VDLM2 channels while minimizing the impact on existing users. A summary of the plan was briefed (Appendix A), with a record of AFC decisions.

ASRI and the CSPs have been planning for a 4 phase process from initiation on July 1, 2014:

- Reorganize lower band AOC voice users to generate capacity (this includes removing the national de-icing channel)
- Migrate affected voice users from the upper AOC band, to the lower AOC band
- Migrate ACARS networks from the upper AOC band
- Assign VDLM2 frequencies in the upper AOC band.

ASRI noted that as a result of moving more users to the lower band, there could be increased congestion in the lower band that will need to be mitigated, especially the 4 ACARS networks being migrated. A chart illustrating the Phase 3A/3B timeline was presented.

The AFC approved implementation of Phases 1 and 2 to clear way for VDLM2 at the June 2014 AFC Meeting in Vancouver. This includes migration of most upper band users, clearing voice users on 129.350, 131.650, and 131.725 MHz for ACARS movement, and the movement of de-icing users from 129.525 MHz starting next season. ASRI has already notified all 113 affected voice users.

It was agreed to split Phase 3 into two parts (A and B), given the issues surrounding SITA's ACARS base frequency move. Phase 3A concerned migrating the ACARS assignments on 136.575, 136.650, and 136.800 MHz. At the Fall 2014 AFC meeting, the AFC approved moving 136.575 and 136.650 MHz by Q3 2015, and 136.800 MHz by Q1 2017.

Phase 3B concerned only SITA's ACARS base frequency on 136.850 MHz frequency. This had been planned for a 2 year period to migrate given the complexities of the move, but had not yet been agreed subject to SITA seeking additional details.

The Phase 3B migration of ACARS on 136.850 MHz will be discussed at the next AFC meeting given the required implementation timelines for DataComm.

Terry Horn (SITA) provided a presentation (**Document 7A2**) on the SITA USA POA Base Frequency.

Terry provided some background information regarding the SITA POA base frequencies worldwide. Currently SITA has over 400 radios providing POA service on 3 frequencies in the USA. There are over 280 airports with POA service on base frequency 136.850 MHz.

Terry noted that there had been significant discussion within SITA over moving the US ACARS base frequency. As a result, SITA would like to remain on 136.850 MHz if possible, but a move could be feasible if directed by the AFC.

Terry explained that the logistics of an ACARS base frequency change included: notification of airline customers and avionics vendors to start avionics adaptations, identifying a migration approach, and funding the service duplication at key airports (license fees, installation costs, network connectivity, and project management). There may also be an impact on SITA traffic handling with overlapping POA coverage occurring in the USA and Latin America due to different processors in operation. SITA estimated that the timeline for the transition would be approximately 24 months.

A 2 year migration period would mean SITA not deploying their first dedicated VDLM2 channel on 136.800 MHz until Q2 2017 at the earliest. However, Terry noted that ARINC/RC moving their traffic off the CSC earlier would free up CSC capacity, allowing SITA to delay implementing their own dedicated VDLM2 channel.

Airlines present at the AFC meeting were supportive of a SITA ACARS base frequency move, including Fed Ex and UPS. United had stated before the meeting that it supported a move, while additional feedback was required from American, US Airways, and Delta airlines. Since feedback is still outstanding from some airlines, Terry suggested that the AFC decision concerning moving SITA from 136.850 MHz to 131.725 MHz should be delayed until the next AFC meeting.

There was discussion over concerns that delaying the vote until the AFC Spring meeting would push back the migration of the ACARS base frequency network, and therefore new SITA VDLM2 frequencies, by several critical months. However, Terry noted that ASRI's offer of allowing SITA to initially move a secondary ACARS network to 131.725 MHz to ease the process of a base frequency move, would help provide a skeleton network in the short term. This head start would shorten the estimated 24 month period of transitioning the ACARS base frequency, and minimize any impact of delaying an AFC vote.

The secretary solicited AFC input concerning delaying the vote on the start of phase 3B, and it was agreed to delay the vote until the next AFC meeting scheduled for June 2015 given the above information, and SITA's intent to soon begin the roll out of a 131.725 MHz network as a secondary ACARS frequency.

The AFC concluded:

- A planned migration of the SITA ACARS base frequency, relying on early deployment of 131.725 MHz as secondary ACARS network, would provide the necessary foundation for a gradual transition.
- A full change of the SITA ACARS base frequency is feasible by Q2 2017 given SITA's early use of 131.725 MHz as a secondary ACARS frequency.

- Timelines to start migrating aircraft from 136.850 MHz to 131.725 MHz would be approximately a year, given the requirement to establish a new network on 131.725 MHz, and coordinating the decommissioning 136.850 MHz
- The SITA ACARS base frequency decision would be delayed until the Spring 2015 AFC Meeting (June 2015).

Action items for the next AFC meeting concerning the SITA USA POA base frequency change:

- AA/USA and DL to provide an opinion of the SIAT ACARS base frequency move
- SITA/Harris investigate possible duplicate message issue with ACARS processor
- SITA to seek opinions from international airlines on ACARS base frequency move
- SITA to contact all airframers (Airbus, Boeing, Bombardier, Embraer) concerning actions required on frequency change.

Andrew provided feedback on an ad-hoc VDLM2 spectral coordination group setup with FAA DataComm Office, FAA Spectrum Office, Harris, Rockwell Collins/ARINC, SITA, and ASRI. The ad-hoc group is intended to coordinate spectrum management issues with the key stakeholders of the DataComm implementation. The ad-hoc group will use the AFC meetings as a focal point combined with regular telecons, reporting back to AFC on a regular basis for any decisions that are required. Key topics will include the coordinated spectrum plans for use of the lower 136 MHz band, and the justification required for additional VDLM2 channels.

B) Aircraft VDLM2 Low-Power Proposal. (SITA)

There was an outstanding action item for Zbig Jasiukajc (SITA) to ask EuroControl to conduct an RF evaluation simulation to compare low power versus high power operations in an attempt to provide some quantitative data to support the low-power proposal.

Terry Horn (SITA) suggested moving this concept to the AEEC Data Link Users Forum. It was discussed in detail and a decision was made to postpone this proposal from the current AFC agenda until some traction could be found in the relevant groups.

C) 2014 Review of AOC Communications Equipage for Future spectrum Requirements. (ASRI)

Andrew Roy (ASRI) provided a presentation (**Document 7C**) on an ASRI initiative to determine AOC equipage of US based airlines.

The survey assessed the US aviation's current equipage for AOC systems, including 8.33 kHz voice radio capability, VDLM2 data link capability, and some communication links. Ten airlines responded to the survey request with a total aircraft of 3723 included in the results. Andrew thanked everyone that supported the survey, noting that the data only provided an indication of equipage given not all airlines responded.

The airlines that did not participate will be contacted again to solicit their support and update as required.

D) Spectrum Monitoring Capability. (ASRI)

Greg Bourey (ASRI) provided a presentation (**Document 7D**) on the Spectrum Monitoring Capability.

The LS Observer is a portable unit that monitors the frequency ranges over extended periods of time for channel occupancy and usage. The parameters such as range of frequencies to monitor, time to monitor, start and end times, can be programmed by the operator or remotely. ASRI plans to use the monitor at larger US airports to collect statistics on VHF band usage.

The monitor capabilities include the ability to:

- Continuously monitoring the entire AOC spectrum
- Filter specific frequencies or bandwidth
- Triangulate unlicensed transmissions
- Remotely access data at home office
- Demodulate, listen and record transmissions.

E) AFC Documentation Review for 2014/2015. (ASRI)

Michael Hinojosa (ASRI) and Andrew Roy (ASRI) gave a short briefing on the status of the AFC Documentation Review.

Mike indicated that ASRI was going to review the documentation within ASRI before submitting drafts to the AFC for consideration. Andrew briefed that the last time the AFC Manual was reviewed was 2012 and since then there have been changes regarding VDLM2. There is also legacy and administrative information that needs to be reviewed and updated. Any suggested modifications will be brought to the AFC attention for approval. Modifications to the AFC Manual may also impact other ASRI documentation. AFC member input was solicited.

Andrew asked that the airlines bring their de-icing frequencies policies to the next AFC meeting in support of the AFC Manual update.

8. NEW BUSINESS

A) Oil Platform Ground Station Inspection Method (ASRI)

Michael Hinojosa (ASRI) provided a presentation (**Document 8A**) of Oil Platform Ground Station Inspection Method.

Each year ASRI conducts about 1,000 ground station inspections of ASRI licensed stations. The radio inspectors verify the location of radio, the operational frequency, radio equipment being used, and identifying a station representative. Inspection of oil platform based stations are difficult by their very nature, and ASRI would like to find a method to include oil platforms in a regular inspection process.

The plan is for ASRI to work with oil platform customers to devise a method for self-inspection to ensure compliance with FCC and ASRI regulations. The procedures must be easy to follow and allow for accurate data to be collected and returned. ASRI plans to provide a briefing at a future HSAC meeting on the inspection program.

B) ASRI Change of Address on License. (ASRI)

Michael Hinojosa (ASRI) provided a report on the ASRI Change of Address on License.

Mike stated that this is an administrative change. Mike requested that end users ensure they replace their existing licenses with the updated versions at ground station control points.

9. MEETING SUMMARY (SECRETARY)

A) Summary and Action Items from the Meeting

Andrew Roy (ASRI) provided key points from the AFC meeting:

Summary of key points

- The LightSquared/GPS issues is not dead
- AeroMACS is still awaiting a decision at the FCC for allocation status.
- ADS-B over satellite is supported by the AFC provided it meets key conditions on compatibility and procedure.
- Preparation of upper 136 MHz band ready for VDLM2 frequency plan to be completed by end of Q2 2017
 - Voice users cleared by Q2 2015
 - First dedicated VDLM2 frequency available during Q3 2015
- AFC communications survey
 - 8.33k channels not a requirement at this time
 - VDLM2 MF adoption rate is approx. 20-25% of existing VDLM2 avionics

Action Items

- AA/USA and DL to provide opinion of the SITA ACARS base frequency move
- All airlines/cargo carriers to provide details on usage of deicing frequencies to help shape future AFC policy on their assignment.
- SITA/Harris investigate possible duplicate message issue with ACARS processor
- SITA to seek opinions from international airlines
- SITA to contact all airframers (Airbus, Boeing, Bombardier, Embraer) concerning actions required on frequency change.
- ASRI to present first draft of AFC manual review at the next AFC meeting.
- ASRI to review antenna installation regulations and provide feedback.
- ASRI to work with helicopter operators to devise regular oil platform inspection method.

B) AFC Topics for the Attention of the ASRI Board of Directors

A slide pack for the ASRI Board of Directors covering the summary of key points and topics discussed was approved by the meeting.

10. LOCATION OF NEXT MEETINGS. (SECRETARY)

The Spring 2015 AFC meeting is scheduled for 16-17 or 23-24 June 2015 in Anchorage, Alaska.

The Fall 2015 AFC meeting is provisionally scheduled for 6-7 October 2015 in Montreal, Canada (to be ratified at the AFC Spring 2015 Meeting).

11. ANY OTHER BUSINESS.

A) Company updates and closing remarks. (AFC Roundtable)

- (i) Tim Totten (UPS) suggested discussion at a future AFC meeting dealing with local airport authorities requesting the submission of FAA form 7460 prior to use of an existing antenna or for the installation of an antenna at the airport.
- (ii) The committee gave special thanks to Harris for hosting the meeting.
- (iii) Many thanked ASRI for hosting the dinner on Tuesday evening.

12. ADJOURNMENT (CHAIRMAN)

The meeting was adjourned by the Chairman at 12:15 PM, March 11, 2015.

Andrew Roy
Executive Secretary

Documents posted to ASRI Website

APPENDIX A - VDLM2 PLAN SUMMARY

- 129.525 (de-icing), 129.350, 131.650, & 131.725 MHz voice users cleared by Q1 2015
 - Agreed AFC Spring 2014
- Majority of voice users in upper 136 MHz band moved by Q1 2015 (except 136.500, and 136.525 MHz)
 - Agreed AFC Spring 2014 Meeting
- 136.575, & 136.650 MHz ACARS users to be moved by Q3 2015
 - Agreed AFC Fall 2014 Meeting
- 136.800 MHz ACARS users to be moved by Q1 2017
 - Agreed AFC Fall 2014 Meeting (though provider has since notified ASRI that Q1 2016 is now feasible)
- 136.850 MHz ACARS move
 - Subject to AFC approval at Spring 2015 meeting

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Frequencies	2014	2015	2016	2017
(MHz)	07/01	01/01	07/01	01/01
136.550-136.950	Clearing Voice*		All Adjacent Channels Cleared	
136.575	ACARS	ACARS Migration**	Cleared	
131.725	Clearing Voice	↳	ACARS**	
136.650	ACARS	ACARS Migration	VDLM2 ARINC/RC	
129.350	Clearing Voice	↳	ACARS	
136.800	ACARS		ACARS Migration	VDLM2 SITA
129.525	Clearing De-icing Usage		↳	ACARS
136.850	ACARS	ACARS Migration***		Cleared
131.725	Clearing Voice	↳		ACARS**

*Some voice users will be moved to 136.500 and 136.525 MHz.

**While consolidating 136.575 and 136.850 MHz into 131.725 MHz to support the migration of the SITA ACARS base frequency move, any additional assignments required for capacity will be made on 131.650 MHz. This will be available from the 1 Jul 2015.

***Date and actions subject to change until approved by AFC.

Proposed VDLM2 Channel plan for DataComm <i>(Based on the AFC's agreed VDLM2 channel plan 2010)</i>		
Frequency (MHz)	Allocation	Notes
136.975	Common VDLM2 Channel	Already assigned nationally to both CSPs
136.950	Guard Band Channel	
136.925	Guard Band Channel	
136.900	Guard Band Channel	
136.875	Guard Band Channel	
136.850	Guard Band Channel	
136.825	Guard Band Channel	
136.800	VDLM2 Ground SITA	On-site - Planned for national US deployment
136.775	Guard Band Channel	
136.750	VDLM2 Enroute SITA	Off-site (>1 mile) - Planned for national US deployment
136.725	Guard Band Channel	
136.700	Guard Band Channel	
136.675	Guard Band Channel	
136.650	VDLM2 Ground ARINC/RC	On-site - Planned for national US deployment
136.625	Guard Band Channel	
136.600	VDLM2 Enroute ARINC/RC	Off-site (>1 mile) - Planned for national US deployment
136.575	Guard Band Channel	
136.550	Guard Band Channel	
136.525	Voice users	Select US areas only
136.500	Voice users	Select US areas only