VDLM2 Implementation

AFC Fall 2015 Meeting – Montreal

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VDLM2 Multi-Channel Implementation

- Update on VDLM2 progress from involved organizations
- Summary of VDLM2 spectrum meeting
- Other VDL considerations

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VDLM2 Implementation Plan

- ASRI proposed an implementation method after working with CSPs, Harris and the FAA
  - Assign new VDLM2 channels while minimizing impact on existing users
- Planned for 4 phase process from initiation on 1 Jul 2014
  1. Reorganize lower band AOC voice users
  2. Migrate affected voice users from upper AOC band
  3. Migrate upper band ACARS networks
     a) Secondary ACARS networks (3)
     b) SITA ACARS base frequency
  4. Assign new VDLM2 frequencies
     a) Upper 136 MHz band (AFC)
     b) Lower 136 MHz band (FAA)

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Phase 1 - ASRI

Lower AOC band voice user reorganization

- Agreed AFC Spring 2014 Meeting
  - 129.525 (de-icing), 129.350, 131.650, & 131.725 MHz voice users cleared by Q1 2015

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Phase 2 - ASRI

Migration of upper AOC band voice users

- Agreed AFC Spring 2014 Meeting
  - Majority of voice users in upper 136 MHz band moved by Q1 2015
  - Voice users remaining on 136.500, and 136.525 MHz
    - Potential for specialist voice users on interstitial channels

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Phase 3A – SITA & ARINC/RC

Migration of secondary ACARS networks in upper AOC band

- Revised at AFC Spring 2015 Meeting
- SITA
  - 136.575, & 136.650 MHz ACARS users to be moved by Q3 2015
- ARINC/RC
  - 136.800 MHz ACARS users to be moved by Q1 2016
- Both CSPs are responsible for ACARS interference mitigation and resolution with incumbent voice users when migrating to the lower AOC band

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Phase 3B - SITA

- Migration of SITA ACARS base frequency from 136.850 MHz to 131.725 MHz by Q3 2017
- Agreed AFC Spring 2015 Meeting
  - The 131.725 MHz frequency is available immediately
  - Q3 2017 deadline subject to VDLM2 deployment requirements as they develop
  - No other ACARS GSs will be licensed on 136.850 MHz, with the exception of SITA, provided separated is a minimum of 1 mile from an airport boundary and other VDLM2 stations
  - SITA to coordinate with airlines and airframe manufacturers on ACARS frequency changes, to consolidate and minimize any costs for the changes

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Phase 4 - ASRI

- Assignment of VDLM2 frequencies
  - Upper 136 MHz channel plan confirmed
  - Lower 136 MHz plan being discussed with the FAA

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VDLM2 Channel Plan

- Refined from AFC VDLM2 planning in 2010
  - Implemented for specific CSPs
  - Included pending lower 136 MHz band planning
- Provides best available spectral/physical separation
  - Supporting a dedicated ground and enroute station for each CSP

Proposed VDLM2 Channel Plan

Frequency (MHz)	Allocation	Notes
136.975	Common Signaling Channel	Already assigned nationally to VDLM2
136.950	Guard Channel	
136.925	Guard Channel	
136.900	Guard Channel	
136.875	Guard Channel	
136.850	Guard Channel	
136.825	Guard Channel	
136.800	VDLM2 on-site SITA	Primarily ground traffic - Planned for national US deployment
136.775	Guard Channel	
136.750	VDLM2 off-site SITA	Primarily enroute traffic - Planned for national US deployment
136.725	Guard Channel	
136.700	Guard Channel	
136.675	Guard Channel	
136.650	VDLM2 on-site RC	Primarily ground traffic - Planned for national US deployment
136.625	Guard Channel	
136.600	VDLM2 off-site RC	Primarily enroute traffic - Planned for national US deployment
136.575	Guard Channel	
136.550	Guard Channel	
136.525	ASRI voice users	Select US areas only
136.500	ASRI voice users	Select US areas only

Frequency (MHz)	Allocation	Notes
136.475	FAA voice users	National
136.450	FAA voice users	National
136.425	Guard Channel	
136.400	Guard Channel	
136.375	Guard Channel	
136.350	VDLM2 off-site SITA	Primarily enroute traffic - Planned for national US deployment
136.325	Guard Channel	
136.300	VDLM2 on-site SITA	Primarily ground traffic - Planned for national US deployment
136.275	Guard Channel	
136.250	Guard Channel	
136.225	Guard Channel	
136.200	Guard Channel	
136.175	Guard Channel	
136.150	VDLM2 off-site RC	Primarily enroute traffic - Planned for national US deployment
136.125	Guard Channel	
136.100	VDLM2 on-site RC	Primarily ground traffic - Planned for national US deployment
136.075	Guard Channel	
136.050	Guard Channel	
136.025	Guard Channel	
136.000	Guard Channel	

Current timelines

Frequencies	2014	2015		2016		2017	
(MHz)	07/01	01/01	07/01	01/01	07/01	01/01	07/01
136.550-136.950	Clearing Voice*	All Adjacent Channels Cleared					
136.575	ACARS		ACARS Migration**	Cleared			
131.650	Clearing Voice	Cleared	⮑	ACARS**			
136.650	ACARS		ACARS Migration	VDLM2 RC			
129.350	Clearing Voice	Cleared	⮑	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	Cleared		⮑		ACARS**	

*Some voice users will be moved to 136.500 and 136.525 MHz.
**Date and actions subject to change dependent on VDLM2 traffic requirements.

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VDLM2 Spectral Group Meeting Summary

- Draft proposal for new VDLM2 justification
  - Based on 95% percentile latency requirement
  - Using historical trends
- Extrapolate the monthly 95% latency values out 18 months
  - Based on the last 12 months
  - Based on the last 6 months
- If projection exceeds 7.5 seconds at 18 months
  - Verify increase in channel utilization is commensurate with throughput growth
  - Verify growth in data throughput
  - Request channel

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FAA Proposal

- New FAA proposal for lower 136 MHz VDLM2 band plan
  - Included guidance on FAA clearance process
- Would require moving of ASRI voice users to lower 136 MHz band
  - ASRI and Harris reviewing the proposal for technical and operational reasons

Other VDL Considerations?

- Reports from airlines that VDLM2 message traffic is not efficient on new aircraft
  - B787 singled out, but A350/A380 concerns too
  - Messages are excessive and not efficient formatted
  - Congestion levels pushing out airline AOC and AAC messages
- Creating additional overhead and eventual network congestion
  - Several major US and EU airlines complaining in DLUF
  - Critical when in context of DataComm latency requirement and costs (end user and CSP)
- Coordinate approach to manufacturers to find a solution
  - Current and future airframes

Future Work

- Review of issue and those affects
  - Tentative discussions on collecting data
  - Will need support of CSPs (with airline permission)
- Coordinate approach to manufacturers to find a solution
  - Current and future airframes

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Questions?

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