

HM-1 Committee for Integrated Vehicle Health Management

PHM Society Panel Discussion
September 26, 2012

Goals for HM-1 Committee

- Review industry experience and the “state-of-the-art” technologies for integrated vehicle health management
- Publish documents known as SAE Aerospace Standards (AS), Aerospace Recommended Practices (ARP), Aerospace Information Reports (AIR), and Aerospace Resource Documents (ARD)
- Analyze and report on various approaches to IVHM (e.g. health management systems, fault prediction capabilities, data standards, ground software interfaces, etc.).
- Develop standards and recommended practices for IVHM equipment and techniques, e.g. overall system architecture, determination of system health, identification of signals common to IVHM systems, etc.
- Develop new requirements and uses for IVHM technologies to promote cost effective operation of vehicles.

HM-1 – SAE IVHM Technical Committee

- **Chair – Mike Roemer, Impact Technologies.**
- **Vice-chair – Francis Peloquin, Bombardier**
- **Approved by Aerospace Council October 2010**
- **100+ members from 5 continents**

- **1st Meeting** San Francisco – April 2010*
- **2nd Meeting** Toulouse – October 2011
- **3rd Meeting** Seattle – March 2012
- **4th Meeting** Cleveland, OAI – October 3-5, 2012*
- **5th Meeting** Cologne, EASA – March 12-14 2013
 - Operator panel
 - Regulator panel

* - Joint with E-32 EHM Committee

One Table, One Standard – HM-1

Airbus
BAE Systems
The Boeing Company
Bell Helicopter
Bombardier Aerospace
Cassidian
EADS
Embraer
EUROCOPTER
GE Company
GM
Gulfstream
Lockheed Martin
Northrop Grumman
Pratt & Whitney
Rolls-Royce

PREDICT
Devivo AST
Global Strategic
Solutions
Impact Technologies
Metis Design
NRG Systems
OSYS
Ridgetop

EASA ICAO
FAA Transport Canada

MoD (UK)
NAVAIR (US)
US Army
US Air Force

United Airlines
Standard Aero
Lufthansa Technik

CIRA
Cranfield University
NASA
National Research Council
(Canada)
National Aerospace
Laboratories (India)



HM-1 Task Groups

- Design
- Architecture
- V&V, Metrics and Certification
- Data & Information Management
- Business Case
- Avionics

SAE HM-1 Document Roadmap

SAE IVHM Steering Group Oversight

HM-1 IVHM Technical Committee

ARP6803
IVHM Cornerstone Document

BUSINESS

ARP6275 Cost Benefit Analysis of IVHM Systems

ARPXXXX Guidelines for Certification of IVHM Systems

TECHNOLOGIES

ARPXXXX Architecture of an IVHM System

ARP6883 Requirements of an IVHM System

ARP6407 Guidelines for the Design of an IVHM System

ARPXXXX Verification & Validation of an IVHM System

ARPXXXX Guidelines For IVHM System Software And Airborne Electronic Hardware Assurance Levels

APPLICATION

ARP6212 Volcanic Ash

AS5391 HUMS Accelerometer Interface

AS5392 HUMS Rotational System Indexing Sensor

AS5393 HUMS Blade Tracker Interface

AS5394 HUMS Advanced Multipoint Interface

AS5395 HUMS Data Interchange

SAE HM-1 Works in Progress

Standard	Title	Status
SAE ARP6803	IVHM Cornerstone	Currently Working on First Draft
SAE ARP6275	Cost Benefit Analysis of IVHM Systems	Currently Working on First Draft
SAE ARP6212	The Potential Use of Health Monitoring Technologies During or After Volcanic Events	Currently Working on First Draft
SAE ARP6407	Guidelines for the Design of an IVHM System	Currently Working on First Draft
SAE ARP6883	Guidelines for Writing IVHM Requirements for Aerospace Systems	Currently Working on First Draft
SAE ARPXXXX	Architecture of an IVHM System	Working Group close to launching document
SAE ARPXXXX	Verification & Validation of IVHM Systems	Will be done following ARP6883
SAE ARPXXXX	Guidelines For IVHM System Software And Airborne Electronic Hardware Assurance Levels	TBD
SAE ARPXXXX	Guidelines For Certification Of IVHM Systems	TBD
SAE ARPXXXX	Ground Stations	TBD