Integrated Aircraft Health Monitoring

IAHM

Presented to: IATA

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Date: November 26, 2018

What is IAHM?

- **Integrated Aircraft Health Monitoring (IAHM) is a general "umbrella" term that covers a wide variety of health management technologies**
- **Examples: HUMS, AHM, SHM, ECM, ACMS, etc…**
- **Avoids the use of proprietary terms**

Current Processes

- **AC 29-2 & 27-1B**
- **SAE International**

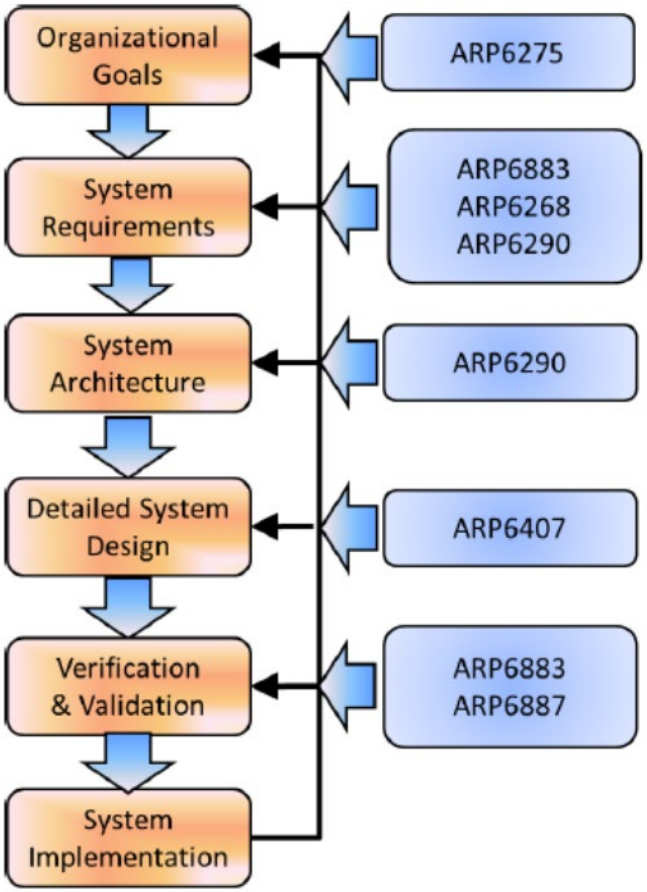
AC 29-2 & 27-1B

- Rotorcraft published AC 29-2 & 27-1B, MG15
- MG-15 gives an end to end concept for Health and Usage Monitoring System (HUMS)
- Lists three major components of HUMS
  - Equipment installation/qualification (air and ground)
  - Credit validation activities
  - Instructions for Continued Airworthiness

SAE International

- **Published ARP6803, IVHM Concepts, Technology and Implementation Overview**
- **The cornerstone document for IVHM**
- **Provides an in-depth view of a six step system starting with organizational goals and ending with system implementation.**

SAE International



SAE International

ARP6268	UNK	
ARP6275	Determination of Cost Benefits from Implementing an Integrated Vehicle Health Management System	07/07/2014
ARP6290	Guidelines for the Development of Architectures for Integrated Vehicle Health Management Systems	WIP
ARP6407	Integrated Vehicle Health Management Design Guidelines	WIP
ARP6883	Guidelines for writing IVHM requirements for aerospace systems	WIP
ARP6887	Verification & Validation of Integrated Vehicle Health Management Systems and Software	WIP

SAE International

- **AIR6900,** Applicable Aircraft Integrated Vehicle Health Management (IVHM) Regulations, Policy, and Guidance DRAFT
- Lists and describes a collection of regulations, policy, and guidance documents applicable to design approval applicants, aircraft operating certificate holders, and maintenance repair and overhaul (MRO) organizations. The aircraft industry's compliance with these rules will enable adoption of IVHM technology for use in aircraft maintenance.
- Scope is limited to the United States (U.S.) Federal Aviation Administration (FAA) information only in this version but future revisions intend to include other regulator input

Root System Criticality

- **Defined:** The system that will benefit from IAHM.
- **Example:** Tire pressure, ARP 6137

Expectations Based on Criticality

- IAHM falls into different categories
- There should be scalable sampling rates
- DAH will define data transfer and analysis standards
- DAH will define method to accommodate data lapses
- Operator's program will be based on DAH guidance

Expectations

- **DAH will establish ICAs for the IAHM system.**
- **Specialized training for IAHM program personnel**
- **System and data security requirements**

IAHM Categories

- **Simple:** Data retrieved for legacy trend analysis.
- **Advanced:** Certified for credit. Information used for maintenance program validation and adjustments by the operator and DAH. May be used for airworthiness determinations.
- **Complex:** Same as advanced but uses bidirectional communication.

IAHM Security

- **Basic:** Minimal security
- **Advanced:** Moderate unless being used for airworthiness determinations
- **Complex:** High due to bidirectional data transfer and airworthiness implications

FAA Go Forward Plan

- **How broad will the application be? Parts 23, 25, 27, 29 and 33? UAS? Or just limit to part 25**
- **What will we call it? AHM, IAHM, HUMS, etc….?**
- **Necessary to conduct rulemaking or create an advisory circular or circulars?**

Go Forward

- **Regardless of rulemaking, do we want a single AC that goes from certification to operator involvement or separate ACs? One for certification (AC 27-1 and 29-2) and another for operator approval.**
- **Can we design an interim process to expedite an IAHM system certification? Special condition?**

Go Forward

- **How will an operator be authorized as a participant: OpSpec, Approved Maintenance Program, Reliability Program, etc…?**
- **Will optional operator IAHM participation be allowed?**
- **Can we promote industry standard development?**

Current Interfacing Guidance

ACs

- **20-174, Development of Civil Aircraft and Systems**
- **23-1309-1E, System Safety Analysis and Assessment for Part 23 Airplanes**
- **25-19A, Certification Maintenance Requirements**
- **25-1309-1A, System Design and Analysis**

Current Interfacing Guidance

- 27-1B, Certification of Normal Category Rotorcraft
- 29-2C, Certification of Transport Category Rotorcraft
- 33.4-1, Instructions for Continued Airworthiness
- 33.28-1, Compliance Criteria for 14 CFR §33.28, Aircraft Engines, Electrical and Electronic Engine Control Systems

Current Interfacing Guidance

- 43.9C, Maintenance Records
- 120-16G, Air Carrier Maintenance Programs
- 120-78A, Electronic Signatures, Electronic Recordkeeping, and Electronic Manuals
- 121-22C, Maintenance Review Boards, Maintenance Type Boards, and OEM/TCH Recommended Maintenance Procedures
- Currently there is an AC for operator certification in FAA internal draft

Questions

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