
International Civil Aviation Organization

ASBU/SIP/Lima/2012-WP/24F

Aviation System Block Upgrades


Module N° B0-101/PIA-3

ACAS Improvements

Workshop on preparations for ANConf/12 – ASBU methodology
(Lima, 16-20 April 2012)

Module N° B0-101

ACAS Improvements



Summary	To provide short term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory perturbation and increase safety in cases where there is a breakdown of separation.	
Main Performance Impact	KPA-04 Efficiency, KPA-10 Safety	
Domain / Flight Phases	En-route flight phases and approach flight phases.	
Applicability Considerations	Safety and operational benefits increase with the proportion of equipped aircraft.	
Global Concept Component(s)	CM – Conflict Management.	
Global Plan Initiatives ()	GPI-2 reduced vertical separation minima GPI-9 situational awareness GPI-16 Decision support systems and alerting systems	
Pre-Requisites	No	
Global Readiness Checklist		Status (ready now or estimated date)
	Standards Readiness	✓
	Avionics Availability	✓
	Ground Systems Availability	N/A
	Procedures Available	✓
	Operations Approvals	✓

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Module N° B0-101 - Baseline



- ACAS is subject to global mandatory carriage for aeroplanes with a MTCM greater than 5.7 tons.
- The current version of ACASII is 7.0.

Module N° B0-101 – Change Brought by the Module



- Implements several optional improvements to airborne collision avoidance system in order to minimize “nuisance alerts” while maintaining existing levels of safety.
- **Element → Improved ACAS operations**
 - TCAS version 7.1 introduces significant safety and operational benefits for ACAS operations.
 - Agreed to mandate the improved ACAS (TCAS version 7.1) for new installations as of 1/1/2014 and for all installations no later than 1/1/2017.

Module N° B0-101 – Intended Performance Operational Improvement



Efficiency	ACAS improvement will reduce unnecessary RA and then reduce trajectory perturbation
Safety	ACAS increase safety, as collision avoidance system and case of failure of the separation provision.
CBA	TBD

Module N° B0-101 – Necessary Procedures (Air & Ground)



- ACAS procedures are defined in PANS-ATM (Doc 4444) and in PANS-OPS (Doc 8168)

Module N° B0-101 – Necessary System Capability



- **Avionics**

- RTCA DO185B / EUROCAE DO143 MOPS are available for TCAS implementation.
- RTCA DO325 Annex C is being modified to accommodate the 2 functions (APFD and TCAP). It should be ready by Q1 2013.

- **Ground Systems**

- Not Applicable

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Module N° B0-101 – Training and Qualification Requirements



- Training in the operational standards and procedures are required
- Likewise, the qualifications requirements are identified in the regulatory requirements
- Training guidelines are described in the ACAS Manual (Doc 9863). Recurrent training is recommended.
- Likewise, the qualifications requirements are identified in the regulatory requirements

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Module N° B0-101 – Regulatory/standardization needs and Approval Plan (Air & Ground)



- **Regulatory/Standardization:**
 - Use current published requirements
- **Approval Plans:**
 - Must be in accordance with application requirements e.g. EASA NPA 2010-03 requirement of 1/3/2012 for new installations and 1/12/2015 for all installations, or ICAO mandate of 1/1/2014 for new installations and 1/1/2017 for all installations.

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Module N° B0-101 – Reference Documents



- **Standards**
 - ICAO Annex 6 — Operation of Aircraft, Part I - International Commercial Air Transport – Aeroplanes, carriage requirements;
 - ICAO Annex 10 —. Aeronautical Telecommunications, Volume IV - Surveillance Radar and Collision Avoidance Systems; (Including Amendment 85- July 2010)
 - EUROCAE ED-143 / RTCA DO-185B, Minimum Operational Performance Standards for Traffic Alert and Collision Avoidance System II (TCAS II);
 - RTCA DO-325, Minimum Operational Performance Standards (MOPS) for Automatic Flight Guidance and Control Systems and Equipment. Appendix C estimated 2013
 - RTCA DO185B / EUROCAE DO143 MOPS for TCAS implementation.
- **Procedures**
 - ICAO Doc 4444, Procedures for Air Navigation Services - Air Traffic Management;
 - ICAO Doc 8168, OPS — Aircraft Operations, Volume I — Flight Procedures.
- **Guidance Material**
 - ICAO Doc 9863, Airborne Collision Avoidance System (ACAS) Manual.
- **Approval Documents**
 - FAA TSO-C119c; EASA ETSO-C119c; FAA AC120-55C; FAA AC20-151a; RTCA DO-185B, MOPS for TCAS II; RTCA DO-325, Appendix C, for APFD and TCAP; EUROCAE ED-143, MOPS for TCAS II.

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Module N° B0-101 Implementation - Benefits and Elements



- ACAS Improvements
 - **Benefits: Efficiency and Safety**
 - **Element:**
 - **Avionics: ACAS II (TCAS version 7.1)**
- To be reflected in ANRF**

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