EASA
European Aviation Safety Agency

Product Certification and Design Organisation Approval Workshop

22nd -23rd November 2016

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EASA
European Aviation Safety Agency

Certification Programme

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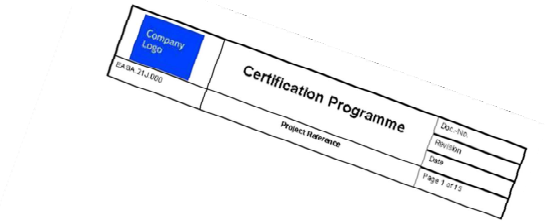
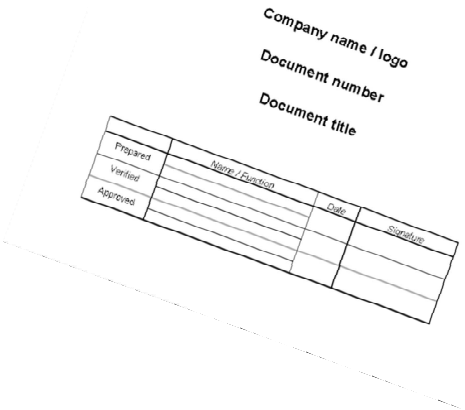
Purpose of Certification Programme

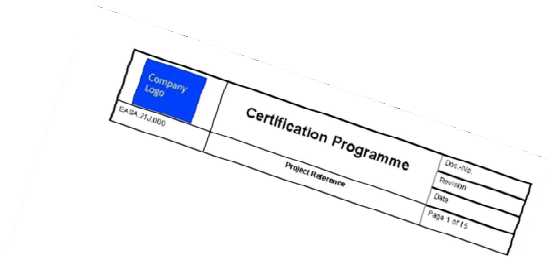
- **Key document to specify a design project**
  - Describes the design
  - Identifies certification requirements and the means to demonstrate compliance
  - Identifies relevant personnel
  - Provides project schedule
  - Provides compliance checklist



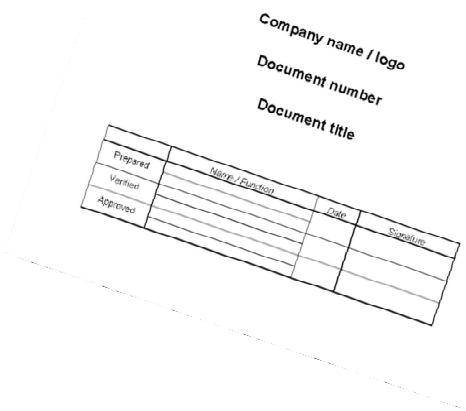


Purpose of Certification Programme

- **Can be used to demonstrate capability for ‚least complex' cases (ELA 1)**



  - weak spot: does not demonstrate capability to comply with all obligations



- **quality of the Certification Programme impacts EASA / Applicant collaboration**

Example: Project Description

6 DESCRIPTION

This Change comprises two parts as follows:-

i) Replace the existing TDR-94D Mode S transponders P/N 622-9210-007 with an upgraded version of the TDR-94D P/N 622-9210-409.

ii) Introduce wiring changes to provide data for Enhanced Surveillance parameters from the existing Garmin GPS-400 GPS receiver plus some other configuration wiring changes due to the change of TDR-94D part number. The data wiring from the ADC-85A is changed from transponder ARINC 429 Altitude Port B to Port A and also the AIS/ADS port. New wiring is added from the ADDU to ARINC 429 Altitude Port B. The use of ARINC 429 Altitude ports A and B required revised configuration strapping and the ENCD ALTM switch is wired to the Port A/B Select on the transponders. Additional wiring changes are an extended squitter inhibit and relocation of the weight on wheels discrete on the transponders. No other wiring changes are made.

The existing transponder controller and TCAS interfaces are unchanged from that previously certificated. It should be noted that the altitude data now uses ARINC 429 rather than Gillham code, however the data sources i.e. the ADC and ADDU, are unchanged.

The transponders are configured for ARINC 429 air data. ADC #1 (Pilot) data is provided to the transponder ALT Port A. IS&S ADDU (co-pilot) data is provided to the transponder ALT Port B. The flight deck ENCD ALTM 1/2 switch selects either the Pilot's or Co-pilot's altimeter respectively.

Example: Cert. Requirement

2 INTRODUCTION

This document presents the proposed plan for the certification of Change [redacted] into the Beechcraft King Air B200 aircraft. This Certification Plan for the Introduction of Enhanced Surveillance is used by [redacted] establish an agreement between EASA and [redacted] or the technical requirements, including the data and the methods that will be used in this Supplemental Type Design approval (STC certification) sought by [redacted]

3 CERTIFICATION DISCUSSION

3.1 PROPOSED CERTIFICATION BASIS DETERMINATION

3.1.1 Existing Certification Basis

The certification basis for the Beechcraft King Air B200 aircraft is as detailed in EASA Type Certificate Data Sheet (TCDS) IM.A.277 Issue 04, dated 4th July 2013, which references FAA TC A24CE. The certification basis is 14 CFR, Part 23, effective 1st February 1965, as amended by Amendments 23-1 through 23-9, for various sub-parts amendments 23-11, 23-14, 23-15, 23-20, 23-23 and 23-26 and for Electronic Flight Instrument System amendments 23-34 & 23-41.

Note: The subject aircraft is a B200 with Collins Proline II avionics i.e. prior to Collins Proline 21.

Change [redacted]B introduces Mode S Enhanced Surveillance to the Beechcraft King Air B200.

Example: MOC

Subpart F EQUIPMENT				
Regulation 14 CFR	**Sub Para**	**Amdt**	Notes/Remarks	MOC
23.1301	(a)(1) (2)(4)	23-7	***Function and Installation*** Compliance will be shown by demonstrating the equipment is of the correct type, identified for the intended function and installed correctly. The correct functioning will be demonstrated by ground test in accordance with [redacted]	MC1 MC9 MC5
23.1309	(a) (1), (3)	23-41	***Equipment, Systems and Installations*** Compliance with the Equipment, Systems and Installations functional requirements per original Type design will be shown to be maintained as indicated. The upgraded transponder and wiring changes are to provide Mode S Enhanced Surveillance. The failure classification of the Enhanced Surveillance parameters is MINOR (AMC20-13). The addition of the enhanced surveillance functionality on the aircraft systems required for safe operation will be considered. Ground test will be carried out in accordance with [redacted] AV4477 and EMC tests will be carried out in accordance with [redacted].	MC1 MC3 MC5
	(b)			MC3 MC5
23.1351	(a)	23-7	***Electrical Systems And Equipment - General*** The change includes a transponder upgrade and additional (non-power) wiring. The transponder is an upgraded version of the original transponder. Compliance to this paragraph will be shown by design review and an electrical load statement within the Change Front Sheet [redacted]	MC1
23.1431	-	Original	***Electronic Equipment*** The upgraded TDR-94D transponder (-409) being installed as part of this STC has been qualified to the ED-14E/DO-160E requirements appropriate to the environment. See related equipment approval forms. EMC tests will be carried out in accordance with [redacted] to demonstrate other aircraft systems have not been affected by wiring installation and the upgraded transponder.	MC0 MC1 MC5 MC9

Example: Define the point of contact

Function	Name	contact
Design Engineer	Name	Email/phone
CVE	Name	Email/phone
Airworthiness Office	name	Email/phone

Example: Project Schedule

5 MILESTONE PLAN

DATE	AUTHORITY	DESCRIPTION OF APPLICATION
5 Sept 2013	[redacted]	Contract Authorisation [redacted]
17 Sep 2013	To EASA	Application for STC (Letter ref: TBD)
Sep 2013	To EASA	Certification Plan [redacted] Issue 1 for Review
18 Sep 2013	From EASA	EASA project No. [redacted] received
Nov 2013	To EASA	Certification Plan [redacted] Issue 2 for Review
Expected Nov 2014	To EASA	[redacted] Major Change [redacted] CLOSED
Expected Nov 2014	- - - -	STC delivery to Customer

Example: Compliance Checklist

§§	Title	0	1	2	3	4	5	6	7	8	9	Document Reference	Affected through					Compliance shown
													Electrical System	Mechanical System	Stress	EWIS	Flight Test Aerodynamics	
CS 23.575	Inspections and other procedures																	
Amdt.3		0	1	2								Stress Report, AMM Supplement	n.a.	X	X	n.a.	n.a.	
	D – DESIGN AND CONSTRUCTION																	
	GENERAL																	
CS 23.601	General																	
Amdt.3		0										Compliance Summary	X	X	X	n.a.	X	
CS 23.603	Materials and workmanship																	
Amdt.3	a)	0	1									Design Description	X	X	n.a.	n.a.	n.a.	
	b)	0	1						7			Design Description, Inspection Report	X	X	n.a.	n.a.	n.a.	
CS 23.605	Fabrication methods																	
Amdt.3	a)	0	1						7			Design Description, Inspection Report	X	X	n.a.	n.a.	n.a.	
	b)												n.a.	n.a.	n.a.	n.a.	n.a.	
CS 23.607	Fasteners																	
Amdt.3	a) - c)	0	1									Design Description	n.a.	X	n.a.	n.a.	n.a.	
CS 23.609	Protection of structure																	
Amdt.3	a), b)	0	1						7			Design Description, Inspection Report	n.a.	X	n.a.	n.a.	n.a.	
CS 23.611	Accessibility provisions																	
Amdt.3		0							7			Inspection Report	X	X	n.a.	n.a.	n.a.	
CS 23.613	Material strength properties and design values																	
Amdt.3	a), b), d)	0		2								Stress Report	n.a.	X	X	n.a.	n.a.	
	c), e)												n.a.	n.a.	n.a.	n.a.	n.a.	

Certification Program Template for STC

Objective:

- Develop a Certification Programme template for STC applicants demonstrating capability by providing a certification programme in accordance with 21.A.14(c) (no (A)DOA)

Process:

- Certification Programme template for TCs in the GA Toolbox https://www.easa.europa.eu/easa-and-you/general-aviation/documents-guidance-and-examples was amended and supplemented by further Guidance Material for Procedures (Obligations) and Documentation templates (Test Plan, SB, etc.)

Status:

- Draft available and under internal consultation.
- Publication expected end of 2016.

Obligations

Example of Declaration:

I confirm that I am prepared to comply with the obligations of the (Supplemental) Type Certificate Holder, in particular to

- systematically collect, investigate and analyse reports of and information related to failures, malfunctions, defects or other occurrences which might cause adverse effects on the continued airworthiness of the (changed) product
- report to the Agency any failure, malfunction, defect or other occurrence which has resulted or may result in an unsafe condition
- propose actions to correct deficiencies in the design and submit relevant data to the Agency

Obligations

- **collaborate with the Production Organisation** to ensure satisfactory coordination of design and production and the proper support of the continued airworthiness of the (changed) product
- **hold on record** the relevant design information, drawings and test reports for the (changed) product
- produce, maintain and update master copies of **all required manuals**
- furnish a set of **complete Instructions for Continued Airworthiness** and changes thereto to each known owner of the (changed) product and, on request, to any other person required to comply with them
- **specify the markings** in compliance with Part 21 Subpart Q

Obligations

Appendices contain guidance material regarding

- „Failures, malfunctions and defects“
- Coordination between design and production
- Coordination between design and MRO
- Record keeping
- Manuals and Instructions for Continued Airworthiness
- Markings

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End slide

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