

Design Delegation Seminar 2019

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Instructions for Continuing
Airworthiness for the life of
modifications
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Instructions for Continued Airworthiness



- What has shaped our recent thinking?
- What is the expectation?
- What does this look like in practice?

What has shaped our recent Regulatory thinking on this?

A major event on On December 19, 2005, Chalk's Ocean Airways Flight 101, a Grumman G-73T Mallard crashed in Florida USA – 20 people were killed.



What happened as a result?

1. On 30 May 2007, NTSB found (amongst many other things) that :

- The Approved Aircraft Maintenance Programme was lacking in content – FAA had approved the Maintenance Programme without attention to ICA's for the structural repairs carried out. This was a serious concern for **ageing aircraft as a whole**, especially in cases such as this with limited manufacturer's support
- Evidence that the Maintenance Programme of the aircraft was ineffective was not actioned by the Operator, the Maintainer or the Regulator.

2. Therefore on 12 December 2007 FAA made some significant Rule changes to FAR 25, 25 and 121:

- These Rule changes made holders of design approvals to make available to operators damage tolerance data for repairs and alterations to fatigue critical airplane structure. This rule change was support operator compliance with the Aging Airplane Safety final rule with respect to the requirement to incorporate into the maintenance program, a means for addressing the adverse effects repairs and alterations may have on fatigue critical structure. The intent of this change was to ensure the continued airworthiness of fatigue critical airplane structure by requiring design approval holders to support operator compliance with specified damage tolerance requirements.
- As such ageing aircraft as the G-73T were by 2007, effectively extinct in commercial operations in the USA, the Rule change was restricted to “transport category, turbine powered airplane models with an original TC issued after January 1, 1958.”
- FAA issued Advisory Circular (AC) 120–93, Damage Tolerance of Repairs and Alterations, concurrently with this rule.

What did this mean in New Zealand?

- No Rule changes here, as our Rules already contained the necessary wording.

The CAA's current expectations for all aircraft could thus be defined as :

The maintenance programme for an aircraft must include a means for addressing the adverse effects that repairs, alterations, and modifications may have on the continued airworthiness of the aircraft.

What is the expectation of an ICA in New Zealand?

ICA's need to be ;

- Clear and Concise in their wording with a approach understandable to maintainers
- Practically usable
 - out of phase inspections can be hard to manage for operators, - incorporation into the aircraft's existing maintenance schedule is preferable where possible
 - Physical possibilities of inspection, test, servicing and repair (access) should be considered
- Preferably incorporated into a separate document (Maintenance Manual Supplement)
- Consideration should be given to conflicts with OEM Maintenance Requirements
- Consideration should be given to potential for conflict with other requirements such as Airworthiness Directives and Service Information
- Consideration should be given to future maintainability – aircraft/product may remain in service for 60+ years in a modified state
- Consideration should be given to the utilisation of the aircraft in cases of structural repairs or modifications
- Process for defect reporting is helpful to the end-user

How are major repairs and modifications typically identified to the Operator?

SECTION 7 SUPPLEMENTAL TYPE CERTIFICATE RECORD 029716						
Origin, Reference or STC No.	NZ Mod. No.	Short Title	Signature *Note below	AME/Appr No.	Date	
	RMS-SD-1 ✓	Main Wheel Stone Deflectors	<i>[Signature]</i>	MCA 106	12-8-98	
	MCA CAD 96 ✓	HOBBS Hour Meter	<i>[Signature]</i>	-	-	
	MOD/MCA 4 ✓	Wing Ski Rack Lt.	-	-	-	
	MCA CAB 80 ✓	FITMENT OF SPORTSMAN STOL HE CUFF	-	-	-	
SA 777 NE	MCA CAD 104 ✓	INSTALLATION OF ENGINE COUL LOWERS	-	-	-	
SA 361 NA	RAI 509 ✓	INSTALLATION OF 850x6 MAIN WHEEL TYRES	-	-	2-12-98	
	AC43-14 APP 1 ✓	Installation of Garmin GT PS 296	<i>[Signature]</i>	FL 11229	5-4-06	
	AC43-14 APP 9 ✓	Installation of Graig Stereo	<i>[Signature]</i>	FL 11229	5-4-06	
	AC43-14 ✓	INSTALL AEG ELT Karnd. Bend Lyndon	<i>[Signature]</i>	442185	27/7/07	
SA 71 GL ✓		Bracket Airfilter Assy BA-8110	D.A. BEALE <i>[Signature]</i>	35273	8-1-10	
SA 01026 SE ✓		Improved gascolator assembly Serial # 109	D.A. BEALE <i>[Signature]</i>	35273	8-1-10	
SA 00871 SE ✓		Proper Survival Systems	D.A. BEALE <i>[Signature]</i>	35273	8-1-10	
SA 01074 WI		MCGRAW HILL FLAP ROLLER KIT INSTALLATION	<i>[Signature]</i>		25-1-2011	
AC43-14 APP 11		REMOVE Garmin GPS 296	<i>[Signature]</i>		7/3/16	
SP2067 NM	ICA Report 1502	BAS belts Pilot and copilot Fmsupp Report 132	<i>[Signature]</i>	970085	5-4-17	

NOTE (1) - A signature, licence No. and date in these columns constitutes a release to service in accordance with Civil Aviation Rule - Part 43. 105.

NOTE (2) - If 'yes' placed in repetitive column, enter details of AD on Aircraft Repetitive AD Control Card

section or
lied with.



- The CAA's expectation is that all known major repairs and modifications must contain an ICA in the aircraft's maintenance programme
- The CAA's expectation is that even if these repairs and modifications were made in pre-ICA days, the Operator must nominate an inspection period and an appropriate form of inspection of these items.
- The CAA's expectation is that an Operator measures the effectivity of the approved Maintenance Programme and amends inspections appropriately over time.



The Operator then typically disseminates the working or maintenance content to his maintainer by way of a Technical Directive for action. The maintainer then issues a task card to an individual LAME or AME to perform the work required.

Therefore – clarity of instruction is paramount



This is how an aircraft maintenance engineer would typically receive a list of ICA's to action at a scheduled inspection

ZK- [redacted] Modification Inspections			IME001 Rev 0
Number: WP102778	Date: 13.10.17		
NOTE: Maintenance must be carried out in accordance with Manufacturers ICA's (Latest Rev.) or other approved technical data.			
MOD DESC.	TECH DATA / ICA	FREQUENCY	AME Initials
Aircraft battery - Concorde	ICA AMS515 (Battery maintenance) (Replacement)	600 Hr / 12m 1000Hr / 12m 4years	
[redacted] frame	Goodrich (Rod ends inspection) (Rod ends retire)	150Hr 600Hr 1200Hr 2400Hr	[initials]
[redacted] oxygen bottle D.AW.1271-2	AMS367.2	12m	[initials]
[redacted] fire warning 981	AMS292	1200Hr / 24m	[initials]
[redacted] ex seating C.AW.1269A.1	AMS365.4	100Hr / 6m 300Hr / 12m 1200Hr	[initials]
[redacted] [redacted]	Goodrich ch 25-00-01	1m	NOT INSTALLED [initials]
[redacted] [redacted]	Auto Avia 203/794/E11	1m	NOT INSTALLED [initials]
[redacted] Cockpit lighting	MD779-01 issue 2	24m	
[redacted] stretcher D745	AMS028	350Hr / 12m	
[redacted] HF Radio installation	HQHL032	24m	[initials]
[redacted] tube landing light D889.1	AMS089	150Hr / 12m	
[redacted] fuel pumps C.AW.0010	AMS248	100Hr / 12m	[initials]
[redacted] Night sun	Spectrolab MM NOT INSTALLED	100Hr / 3m 300Hr / 6m 600Hr / 12m 1200Hr / 24m	[initials]
END			

Looking forward

- Any changes (either further damage or other repairs or modifications) to the modified product need to be, as much as possible communicated to the TC holder, the responsible design organisation and the CAA via a CA005D. If the TC holder or design organisation is defunct, this should be communicated also.
- The Design Organisation should in all cases make the future reporting process very clear and endeavour to support its customers as much as possible.

Questions?

