
Type Acceptance Report

TAR 96/02

De Havilland Canada DHC-6 Series 100

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Introduction

This report details the basis on which Type Acceptance Certificate No.96/02 was issued in accordance with NZCAR Part 21B.

Specifically the report aims to:

- (a) Record the airworthiness certification standard used for type acceptance of the applicable model(s) in New Zealand;
- (b) Summarise any outstanding requirements which must be complied with for the issue of a NZ Airworthiness Certificate to any models covered by the Type Acceptance Certificate.

Foreign Type Certificate Details

Type Certificate: A-82
Issued by: Department of Transport, Canada
Manufacturer: De Havilland Canada
Model: DHC-6 Series 100 (Twin Otter)
Engines: Pratt & Whitney PT6A-20
Propellers: Hartzell HC-B3TN-3B/T10173-1
MCTOW 11,000 lb. (11,579 lb. with Mod. 6/1020)
Noise Category: N/A

The certification basis of the DHC-6 Series 100 is CAR Part 3 dated May 15, 1956, including Amendments 3-1 through 3-8, plus Special Conditions for Multi-Engine Turbine Powered Aircraft dated November 6, 1964. (Additional special requirements were imposed by the ARB for UK certificated aircraft.) The aircraft also complies with SFAR 23 when modified in accordance with DH Report AEROC 6.1.G.11.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para 21.41, as CAR 3/SFAR 23 is the predecessor to FAR 23 which is the basic standard for Commuter Category Airplanes called up under Appendix C. There are no non-compliances and no special conditions have been prescribed by the Director.

Type Acceptance Application

The applicant for New Zealand type acceptance was from Great Barrier Airlines by CAA 21021/02 form dated 8 March 1996. The Series 300 Twin Otter has been operated in NZ for many years but this is the first of the Series 100 to be imported.

Type Acceptance Certificate No.96/02 was granted on 4 April 1996.

Type Data

The type data requirements of NZCAR Part 21B Para 21.43 have been satisfied by supply of the following documents:

- (1) Type certificate: Latest revision A-82 Issue 7 dated June 13, 1974 - Already held.
- (2) Airworthiness design requirements: Already held by the CAA.
- (3) Certification compliance listing: Type data already held by the CAA includes:
 - DHC Report AEROC 6.4.G.2 - DHC-6 Design Data for Local and Stress Analysis
 - DHC Report AEROC 6.2.G.5 - DHC-6 Twin Otter Flutter Analysis Summary
 - DHC Report AEROC 6.2.G.3 - DHC-6 Twin Otter Flight Envelopes
 - DHC Report AEROC 6.2.G.0 - DHC-6 Twin Otter Aerodynamic Description
 - DHC Report AEROC 6.2.PP.5 - DHC-6 Twin Otter Nacelle Whirl Flutter
 - DHC Report AEROC 6.4.G.3 - DHC-6 Twin Otter Strength Summary
 - DHC Report AEROC 6.4.G.4 - DHC-6 Twin Otter Structural Test program
 - DHC Report AEROC 6.4.G.6 - DHC-6 Twin Otter Fatigue Summary

 - DHC Report AEROC 6.1.G.12 - DHC-6 Certified Airplanes - Basic Definition for CAA (UK) - August 1972 - Section 1.1 DHC-6 Series 110 CAA Airplanes

 - DHC-6 Twin Otter - Series 100, 200 and 300 -UK CAA Special Conditions for Certification in the Private or Transport Categories - Issue 4 dated 31 January 1983
- (4) Flight manual: DHC-6 Series 100 DoT Approved Flight Manual - Document PSM 1-61-1A - CAA Approved as AIR 2557.
- (5) Illustrated Parts Catalogue: DHC-6 Series 100,200 Parts Catalogue - Document PSM 1-6-4 Issued 1/11/68 and Revised on 1/7/75.
- (6) Maintenance manual and service data for aircraft, engine and propeller: Already held.
- (7) Manufacturer's agreement to supply updates of data in (4), (5) and (6): Already held.

Series 100/110 Conversion

The FoT aircraft s/n 72 was built as a Series 100 with the original customer being the Canadian Government. It was imported as a Series 110 from Fiji, which functions under UK CAA rules. There was no information available as to where or when the conversion had been accomplished. The operator wished to revert to the Series 100 configuration, for compatibility reasons. The manufacturer was contacted and advised this could be accomplished quite simply by a change of Flight Manual and applicable instrument markings and placards. (All the mandatory changes to produce a Series 110 are optional for the Series 100.) A factory produced EO would have been very expensive so a local modification was raised and approved as E6980.

Additional New Zealand Certification requirements

Compliance with the following additional NZ requirements has been reviewed and were found to be covered by either the original certification requirements or the basic build standard of the aircraft, as noted:

NZCAR Section C4

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
2.13(a)	ASI shall be marked in knots	Standard on aircraft - See PSM 1-61-1A Figure 1-5
2.1.3(b)	Altimeter main scale to be calibrated in feet	Standard for UK/US certificated aircraft.
2.1.4(a)	Counter/pointer altimeters	Complies by basic build standard
2.2	Flight data recorder	N/A by aircraft MTOW
2.3	Additional attitude indicator	N/A by aircraft MTOW
2.4	Weather Radar	N/A by aircraft MTOW
3.1	Seats, Safety Belts and Harnesses	Complies by basic build standard

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GEN AD:	REQUIREMENT:	MEANS OF COMPLIANCE:
DCA/GEN/ Series	Various Part 121 Additional Safety Measures	N/A - The 100 Series DHC-6 is only approved for a maximum of nineteen passenger seats.

CASO 4

The DHC-6 Series 100 is classified as a Group C aeroplane per CASO 4. No FM charts were prepared but a general statement put in Supplement D that the basic FM data is to be factored in accordance with CASO 4 and that the single engine inoperative climb performance is to be reduced by a gradient of climb equal to 1%.

CASO 11

The aircraft is an unpressurised short-haul commuter. No oxygen system is fitted.

Outstanding Requirements

The following additional NZ requirements are not covered by the original certification requirements or the basic build standard of the aircraft and require compliance with before issue of an airworthiness certificate:

NZCAR Section C4

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
2.1.3(c)	Altimeter barometric scale in millibars or hectopascals	To be determined on an individual basis
2.1.6	Magnetic compass residual deviation as per NZCAR F.8	To be determined on an individual basis
3.2	Axe	To be determined on an individual basis
3.3.4	Fire extinguisher operating instructions and types	To be determined on an individual basis
3.4	First aid kits as prescribed in Appendix A	To be determined on an individual basis
4.1	Independent radio antenna	To be determined on an individual basis
4.2	Emergency locator beacon	To be determined on an individual basis
6(d)	Red anti-collision light	To be determined on an individual basis
7.1	Flight manual container	To be determined on an individual basis
8.2	Fireproof ID plate	To be determined on an individual basis
8.3	Passenger smoking notices	To be determined on an individual basis
8.9	Nationality and registration marks	To be determined on an individual basis

Type History

The DHC-6 Twin Otter was a development of the single-piston-engined DHC-3 Otter aircraft and first flew in 1965. The Series 100 (s/n 5-115) was the original production version with PT6A-20 engines and a short nose. The Series 200 (s/n 115-230) had a lengthened nose and increased rear baggage capacity. (The long nose can be retro-fitted to any version under Mod.6/1077, with the exception of the floatplane.) The Series 300 was the definitive version with uprated PT6A-27 engines and MAUW increased to 12,500 lb. A total of 844 DHC-6 had been built when production finished in 1988.

The first example of the DHC-6 to arrive in New Zealand was ZK-CJZ, a Series 300 aircraft for Mount Cook Airline, which was first registered on 19 November 1969.

Summary

The DHC-6 Series 100 Twin Otter has been issued with Type Acceptance Certificate No.96/02 and all serial numbers are eligible for a New Zealand Airworthiness Certificate in the Standard Category in accordance with CAR 21.177, subject to the outstanding requirements noted above being met:

Attachments

The following documents form attachments to this report:

- Photographs - DHC-6-100 FoT Example Serial No.27 ZK-DQK
- Three-view drawing DHC-6 Series 100
- Copy of DoT Aircraft Type Approval A-82 extracts

Sign off

David Gill
Airworthiness Engineer

Date: 15 August 1996