Type Acceptance Report

TAR 0/21B/11 – Revision 1

BOMBARDIER DHC-8 Series

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Executive Summary

New Zealand Type Acceptance has been granted to the Bombardier DHC-8 Series based on validation of Transport Canada Type Certificate number A-142. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Appendix 1, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.191, subject to any outstanding New Zealand operational requirements being met. (See Section 5 of this report for a review of compliance of the basic type design with the operating Rules.) Additional variants or serial numbers approved under the foreign type certificate can become type accepted after supply of the applicable documentation, in accordance with the provisions of NZCAR §21.43(c).

NOTE: The information in this report was correct as at the date of issue. The report is generally only updated when an application is received to revise the Type Acceptance Certificate. For details on the current type certificate holder and any specific technical data, refer to the latest revision of the State-of-Design Type Certificate Data Sheet referenced herein.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 0/21B/11 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically, the report aims to:

(a) Specify the foreign type certificate and associated airworthiness design standard used for type acceptance of the model(s) in New Zealand; and

(b) Identify any special conditions for import applicable to any model(s) covered by the Type Acceptance Certificate; and

(c) Identify any additional requirements which must be complied with prior to the issue of a NZ Airworthiness Certificate or for any subsequent operations.

The report covers all models included on the State-of-Design type certificate which have been granted type acceptance in New Zealand. Appendix 1 details which models have been type accepted in accordance with the provisions of CAR Part 21B and which models were certificated prior to that under NZCAR Section B.9 and are now type accepted under the transitional arrangements of Part 21 Appendix A(c).

2. Aircraft Certification Details

(a) State-of-Design Type and Production Certificates:

Manufacturer:	Bombardier Inc. (previously De Havilland Canada, de Havilland Inc.)
Type Certificate:	A-142
Issued by:	Transport Canada
Production Approval:	Certificate of Approval Number 12-58

(b) Models Covered by the Part 21B Type Acceptance Certificate:

(i) **Model:** DHC-8-102

MCTOW:	14,970 kg [33,000 lb.] – DHC-8-101 15,649 kg [34,500 lb.] – DHC-8-102 and DHC-8-103 15,966 kg [35,200 lb.] – DHC-8-103 with Mod. 8Q420649 16,466 kg [36,300 lb.] – DHC-8-106
Max. No. of Seats:	44 (40 passengers, 4 crew)
Noise Standard:	ICAO Annex 16/FAR 36
Engine:	Pratt & Whitney Canada PW120, PW120A or PW121 Type Certificate: E-19 Issued by: Transport Canada
Propeller:	Hamilton Standard 14SF-7, 14SF-15 or 14SF-23 Type Certificate: P7NE Issued by: Federal Aviation Administration

(i) **Model:** DHC-8-201, DHC-8-202

MCTOW:	16,466 kg [36,300 lb]
Max. No. of Seats:	44 (40 passengers, 4 crew)
Noise Standard:	ICAO Annex 16/FAR 36
Engine:	Pratt & Whitney Canada PW123C – DHC-8-201 Pratt & Whitney Canada PW123D – DHC-8-202 Type Certificate: E-19 Issued by: Transport Canada
Propeller:	Hamilton Standard 14SF-15 or 14SF-23 Type Certificate: P7NE Issued by: Federal Aviation Administration

(i) **Model:** DHC-8-311

MCTOW: 18,643 kg [41,100 lb]
18,997 kg [41,880 lb] – [with CR803SO00001 incorporated]
19,905 kg [43,000 lb] – [with CR803SO00002 incorporated]

Max. No. of Seats: 61 (56 passengers and 5 crew)

Noise Standard: ICAO Annex 16/FAR 36

Engine: Pratt & Whitney Canada PW123 – DHC-8-301 and -311
Pratt & Whitney Canada PW123B – DHC-8-314
Pratt & Whitney Canada PW123E – DHC-8-315
Type Certificate: E-19
Issued by: Transport Canada

Propeller: Hamilton Standard 14SF-15 or 14SF-23
Type Certificate: P7NE
Issued by: Federal Aviation Administration

(i) **Model:** DHC-8-402

MCTOW: 27,987 kg [61,700 lb] – with Mod. 4-201539 incorporated
28,988 kg [63,930 lb] – with Mod. 4-308807 incorporated
29,257 kg [64,500 lb] – with Mod. 4-308907 incorporated
29,574 kg [65,200 lb] – with Mod. 4-309238 incorporated

Max. No. of Seats: 74 (68 passengers and 6 crew) – DHC-8-400
76 (70 passengers and 6 crew) – DHC-8-401
92 (86 passengers and 6 crew) – DHC-8-402

Noise Standard: ICAO Annex 16/AWM Chapter 516

Engine: Pratt & Whitney Canada PW150A
Type Certificate: E-29
Issued by: Transport Canada

Propeller: Dowty Propellers R408/6-123-F/17
Type Certificate: EASA.P.002
Issued by: European Aviation Safety Agency

Notes: 1. Refer to Transport Canada TCDS A-142 for specific applicability for of engine and propeller combinations to individual aircraft models.

2. Refer to Advisory Circular 21-1 Appendix 2 for the New Zealand type acceptance status of any engines and propellers listed above.

3. Application Details and Background Information

There have been examples of the DHC-8-102 in New Zealand prior to 1995 when Part 21 was introduced, and those particular model years or serial number ranges were therefore deemed to have a type acceptance certificate under the transitional arrangements of Part 21 Appendix A(c). The first application for New Zealand type acceptance under Part 21B was for the DHC-8-311 from Ansett New Zealand dated 06 January 2000. The airline initially imported two examples previously operated by South African Express Airline, serial numbers 397 and 374 registered as ZK-NEQ and ZK-NER respectively. The DHC-8 is a high wing pressurised twin turboprop Transport Category aeroplane.

Type Acceptance Certificate No.0/21B/11 was granted on 4 March 2000 to the DHC-8-311 based on validation of Transport Canada Type Certificate A-142. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The application for New Zealand type acceptance of the Model DHC-8-202 was from Air National Corporate Ltd, dated 04 April 2003. The first-of-type example was serial number 475, registered ZK-ECR. Type acceptance was granted on 6 June 2003.

The DHC-8 was an all-new regional airliner designed as a successor to the DHC-7, but with the emphasis on operating economics rather than STOL performance. The Series 200 is essentially the original 40-seat Series 100 with the higher power PW123 engines and related systems of the Series 300 stretched version, to achieve a 30 kt higher cruise speed and greater payload. The -202 variant has the PW123D engine version which has flat rated thermodynamic limits for full power at higher ambient temperatures.

The Series 300 is a stretched version of the original 100 Series with fore and aft plugs totalling 3.43 m. Seating is increased to 50 in the standard 32 in. pitch configuration. Other changes include an enlarged aft galley with a separate galley/service door on the RHS. The wingspan is increased by tip extensions. The prototype first flew on 15 May 1987. The Model 311 is the 50-seat “basic aircraft” with PW123 engines, MTOW of 41,000 lb and MZFW of 37,200 lb. A Model 311 can be converted to a Model 314 by embodiment of CR872CH00006 (production) or CR872CH00007 (field retrofit) or CR872CH00008 (factory retrofit). Conversion of a Model 311 to a Model 315 is via CR872SO00011. (The Model 314 has optional PW123B engines which have a 5% nominal power increase, while the Model 315 has the PW123E which have a 5% increase in thermal limit. All three models can have the high gross weight option MTOW of 43,000 lb. There is no configuration difference, except for the installation of an external inflatable ditching dam at the Type III exits for MTOW greater than 41,100 lb.)

Since 1996, all DHC-8 aircraft have been fitted with ANVS (Active Noise and Vibration Suppression). With this system fitted they are marketed as the Q300, as applicable. A total of 404 short-fuselage aircraft and 297 Series 300 aircraft had been manufactured when production of the “Classic” Series finished in 2008. The last examples were an order for eighteen DHC-8-311 aircraft delivered to Air Nelson.

This report was raised to Revision 1 to include the application for New Zealand type acceptance of the DHC-8-400 Series. This was from NAI National Limited, dated 03

August 2016. The application was to support the issuance of a New Zealand STC to the type, as at the time of writing there is no first-of-type example registered in New Zealand. The opportunity was also taken to incorporate the previous separate Type Acceptance Reports issued for DHC-8 series aircraft into a single report of the latest format. Type acceptance was granted on 26 July 2018.

The Bombardier DHC-8-400, released in 2000 and known commercially as the Q400, incorporates a stretch of the fuselage to increase passenger seating capacity, completely new engines and modernized onboard equipment and electronics. The construction of the DHC-8-400 is similar to previous DHC-8s in that it is of primarily aluminium construction with composite materials being limited to very specific areas. The pressurized cabin is equipped to operate up to an altitude of 25,000 feet with a maximum cabin configuration of 92 passengers in the -402 version. The only difference between the DHC-8-400, -401, and -402 models is the interior passenger seating configuration and capacity.

4. NZCAR §21.43 Data Requirements

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents, or were already held by the CAA:

(1) State-of-Design Type certificate:

Transport Canada Type Certificate Number A-142

Transport Canada Type Certificate Data Sheet A-142 at Issue 39 dated 21 July 2016
- Model DHC-8-101 approved 28 September 1984
- Model DHC-8-102 approved 12 June 1986
- Model DHC-8-103 approved 20 July 1987
- Model DHC-8-301 approved 14 February 1989
- Model DHC-8-311 approved 31 July 1990
- Model DHC-8-314 approved 20 February 1992
- Model DHC-8-106 approved 20 November 1992
- Model DHC-8-202 approved 9 March 1995
- Model DHC-8-315 approved 2 June 1995
- Model DHC-8-201 approved 24 August 1995
- Model DHC-8-400 approved 30 July 1999
- Model DHC-8-401 approved 3 August 1999
- Model DHC-8-402 approved 4 August 1999

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:

The certification basis of the DHC-8-100 Series is FAR Part 25 dated February 1, 1965 including Amendments 25-1 through 25-51, plus one paragraph §25.832 (cabin ozone concentration) at Amendment 25-56. There were also a number of Additional Requirements, Special Conditions, Equivalent Safety Items and Exemptions, which have been reviewed and accepted by the CAA. For the next Model DHC-8-301 three additional paragraphs were certified at a later Amendment date. The certification basis for the DHC-8-202 was the same, but the manufacturer elected to upgrade to Amendment 25-66, less some paragraphs at an earlier Amendment, as detailed on the TCDS.

For the DHC-8-400 a new certification basis was developed, which is Transport Canada Airworthiness Manual (AWM) Chapter 525 at Change 525-6 dated 30 December 1993 (equivalent to FAR Part 25 at Amendment 25-79), plus FAR 25 Amendments 25-80 through 25-83. This is equivalent to FAR 25 at Amendment 25-83, plus the additional Canadian AWM requirements detailed on the TCDS. As per TCCA Issue Paper G-5 dated 13 May 1999, the applicable certification basis also includes later FAR Part 25 Amendments 25-84, 25-85, 25-86, and 25-92 which came into effect after the date of application. Also included were three Special Conditions, four Items of Equivalent Safety, and three exemptions.

Compliance for all DHC-8 models with the (optional) applicable requirements for Ice Protection and Ditching has been established.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1, because FAR Part 25 is the basic standard for Transport Category Airplanes called up under Part 21 Appendix C. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) Special Conditions:

All Models:

SCA 2009-03 Seats with Non-Traditional, Large, Non-Metallic Panels, dated 12 March 2012– To provide the level of passenger protection intended by the airworthiness standards, non-traditional, large, non-metallic panels in the cabin must meet the requirements of AWM 525, Appendix F parts IV and V – heat release and smoke emission requirements.

DHC-8-100/-200/-300 Series:

Automatic Take-off Power Control System (ATPCS) – TC Letter 5010-10-366 (ABP/A) dated 24 February 1984 – The ATPCS contains an electronic fuel controller (EFC) which provides an automatic fixed-speed increment increase in the event of an engine failure during take-off. These SC specify limits on the maximum power increment; prescribe system reliability and status monitoring requirements; require provisions for manual selection; prohibit approval if the engine operating limits would be exceeded; and require an independent failure warning system if shown to be needed.

Steep Approach and Short Landing – TC Letter 5010-10-366 (ABP/L) dated 7 June 1985 – This specified requirements related to the All Engines Operating Short landing Distance; Baulked Landing Climb; Controllability and Manoeuvrability; Performance Data Extrapolation; and the Flight Manual Supplement, for a 4.5 degrees approach angle and short landing with reduced 35 ft. screen height.

Special Condition SCA Number 94-12, Operation on Narrow Runways, dated 28 December 1994.

DHC-8-400 Series:

SCA 95-7 High Intensity Radiated Fields (HIRF), dated 19 May 1999– An aircraft hazard/safety analysis was carried out to substantiate the systems/equipment criticality levels. The critical systems/equipment must then be shown to perform their intended functions during and after exposure to certain environments detailed in the SCA.

SCA H2001-01 Approval of Steep Approach Landing Capability for the Bombardier Aerospace DHC-8-400 Series Aeroplanes, dated 22 February 2001– The steep approach landing distance using an approach path angle greater than or equal to 4.5 degrees was determined and safe operational and flight characteristics at the most critical weight and CG demonstrated without displaying any hazardous characteristics.

(iii) Equivalent Level of Safety Findings:

DHC-8-100/-200/-300 Series:

FAR 25.773(b)(2) – Pilot Compartment View - The DHC-8 does not have an openable pilot's window for direct vision but has demonstrated adequate visibility in emergency conditions.

FAR 25.807(d)(2) – Ditching Emergency Exits for Passengers - The DHC-8-300 utilises a pneumatic dam assembly in lieu of keeping one exit above the waterline when ditching (on the low-wing side). Applicable to Model -311 with Change Request CR803SO00001 or CR803SO00002 incorporated.

DHC-8-400 Series:

Various AWM 525 Requirements – Reduced Minimum Operating Speed Factors (Refer to Issue Paper F-1) – Transport Canada developed requirements and equivalent interpretations dated 01 March 1995 governing the approval of aeroplanes for which credit is taken for reduced operating speed factors, based upon V_{S1g}. These requirements and equivalent interpretations are harmonized with the FAA/JAA proposed rulemaking documents NPRM 95-17 and NPA 25B-215, with a few exceptions.

AWM 525.1435(b)(1) – Hydraulic System Testing (Refer Issue Paper M-1) – Contents of proposed amendment to FAR 25.1435(b)(1) as described in NPRM 96-6 (revision of hydraulic system standards to harmonize with European airworthiness standards for transport category airplanes) accepted as an alternate means of compliance which provides an equivalent level of safety.

AWM 525.571(e)(1) – Damage Tolerance Evaluation of Bird Impact (Refer Issue Paper S-3) – Compliance to JAR 25.571(e)(1) accepted as an equivalent level of safety, as the AWM bird impact speed required is subject to erroneous interpretation and application as it does not reflect what was intended. The intent was not to make the bird strike criteria more stringent at altitude, but instead to prevent an applicant from selecting an unrealistic value of V_C at sea level. Therefore the use of "V_C at sea level or 0.85 V_C at 8,000 feet, whichever is greater," is permitted instead of the current 525.571(e)(1) requirement to test from "V sub c at sea level to V sub c at 8,000 feet."

AWM 525.815 – Width of Aisle (Refer to Issue Paper O-8) – Applicable to DHC-8-400 series aircraft fitted with a three abreast business class section (dual class configuration) whereby the left side overhead bin protrudes into the passenger aisle of the aircraft. A low volume overhead storage bin is introduced on the left hand side in this section, while the right hand side overhead bin remains unchanged. Other compensating features such as smooth transitional areas between the two classes were also identified.

(iv) Exemptions:

All Models:

AWM 525.811(g) and 525.812(b)(1)(i) and (ii) – Emergency Exit Signs, TCCA 013-2007-NCR/RCN dated 15 February 2007 – This exemption is issued post type certification to permit installation of emergency exit signs that do not comply with the AWM 525 requirements (non-English lettering and/or marking) on any of the DHC-8-100, -200, -300, -400 aeroplanes for the purpose of facilitating delivery of the affected airplane to a foreign customer.

DHC-8-100/-200/-300 Series:

FAR 25.571(e)(2) – Propeller Debris, TC Letter 5010-10-366 (ABP/A) dated 10 February 1984 - Requirement changed to be all practicable precautions must be taken in the design of the airplane taking into account the design features of the propeller and its control system to reduce the hazard from a failure of a propeller hub or blade.

FAR 25.807(c)(1) 40-seat Passenger Configuration – Series 100 and 200 – TC Letter 5010-10-366 dated 14 March 1986 – The original 39 seat limit was imposed by the passenger emergency exits available. A 40-seat configuration was approved on the basis the DHC-8 exit is larger than a Type II and an evacuation demonstration which showed that 40 passengers could exit through the DHC-8 forward exit faster than 39 passengers are required to exit through a standard Type II exit.

FAR 25.785(h) – Flight Attendant Seats, Exemption No. 89-2 dated 3 February 1989 – only applicable to Series 300. The second (optional) Flight Attendant seat is located at the aft cabin bulkhead, near the pair of type III emergency exits.

DHC-8-400 Series:

AWM 525.562 and 523.785(b) – Stretcher installations, Exemption No. 2002-04 – This exemption permits the installation of a stretcher to be used for non-ambulatory persons only and is limited to a stretcher manufactured by Lifeport Inc. consisting of portable stretcher assembly Aerostretcher Model No. 100-4063-6 and mounting adapter Meddeck Model No. 100-4618.

AWM 525.562 and 523.785(b) – Stretcher installations, NCR/RCN #129-2009 – This exemption permits the installation of a portable medical stretcher, as approved by Transport Canada, to be used for a non-ambulatory person or a person who cannot be seated in an aircraft passenger seat due to medical reasons.

(v) Airworthiness Limitations:

See the Airworthiness Limitation Section of the applicable Maintenance Program – PSM 1-8*x*-7, Maintenance Requirements Manual, Part 2

(3) Aircraft Noise and Engine Emission Standards:

(i) Environmental Standard:

Noise:

The DHC-8 Series 100 and 300 have been certificated for noise under ICAO Annex 16, First Edition, Volume I, Chapter 3, applicable on November 26, 1981 (equivalent to FAR Part 36 including Amendments 36-1 through 36-12), while for the Series 200 and -315 this was updated to ICAO Annex 16, Third Edition, Volume I, Chapter 3, Amendment 4, applicable on November 11, 1993 (equivalent to FAR Part 36 including Amendments 36-1 through 36-20).

The DHC-8 Series 400 has been certificated for noise under AWM 516, Change 516-07 – Chapter 4 (equivalent to ICAO Annex 16, Volume I, Chapter 4 and FAA Part 36 at Amendment 36-28 – Stage 4.)

Emission:

The DHC-8 Series 100 and 300 have been certificated for emissions under SFAR 27 dated December 12, 1973 including Amendments 27-1 through 27-5. For the Series 200 and -315 this was updated to ICAO Annex 16, Second Edition, Volume II, Amendment 2, applicable on November 11, 1993 (equivalent to FAR Part 34 original issue, effective September 10, 1990).

The DHC-8 Series 400 has been certificated for emissions under Canadian Airworthiness Manual (AWM) Chapter 516-2, Subchapter B, "Aircraft Engine Emissions", Change 1, effective 11 November 1993. (This incorporates ICAO Annex 16, Volume II, Aircraft Engine Emissions, Second Edition – 1993).

(ii) Compliance Listing:

AEROC: 84.8.AC.1 – DHC-8 Series 400 Noise Certification Report

(4) Certification Compliance Listing:

DHC Report AEROC 8.1.AC.3 The De Havilland Dash 8 – Airworthiness Compliance Statement – Jan. 1985

Additional Airworthiness Requirements Review doc. – Cold Weather Operation
Additional Airworthiness Requirement – Spoilers – TC Letter 5010-10-(ABE/L)
Spoiler Policy, DOT letter 5010-10-366 (ABE/L) dated September 20, 1984
Memo – New Zealand Operating Requirements – Oxygen

Memo – New Zealand Queries – DHC-8-311
AMA 525/1 Stalls Compliance dated July 9, 1984.
Airworthiness Manual 525.207(b) Stall Warning, initial issue dated 1986
Airworthiness Manual 525.201(d) Stall Demonstration, initial issue dated 1986

Low Temperature Operations, AAR Review Document dated September 10, 1984
Flight Manual Policy, DOT Letter 5010-10-366 (ABP/L) dated June 1, 1984

DHC-8 Series 200, Model 201/202 Compliance Program – AEROC 8.1.AC.3

de Havilland Inc., DHC-8 Type Approval Basis – TC document, includes:
Attachment 2 – Additional Airworthiness Requirement – Aircraft Flight Manual
Attachment 3 – Additional Airworthiness Requirement – Stalls

Boeing Canada Report AEROC 8.1.AC.3 Issue 2 dated June 29/90, DHC-8 Series 300, Model 311 Compliance Program

AEROC 8.1.A.1 Dec 1997 – Dash-8 Certification Reports (listing)

Report AEROC 84.1.AC.3 – DHC-8 Series 400 General Compliance Program (GCP) – dated October 1999

(5) Flight Manual:

D.O.T. Approved Flight Manual – DHC-8 Series 100 Model 102 – Document PSM 1-81-1A – CAA Accepted as AIR 2276

D.O.T. Approved Flight Manual – DHC-8 Series 200 Model 202 – Document PSM 1-82-1A – CAA Accepted as AIR 2828

D.O.T. Approved Flight Manual – DHC-8 Series 300 Model 311 – Document PSM 1-83-1A – CAA Accepted as AIR 2680

D.O.T. Approved FAA Aeroplane Flight Manual DHC-8 Series 400 Model 402 – Document PSM 1-84-1A – CAA accepted as AIR 3370

(6) Operating Data for Aircraft and Propeller:

(i) Maintenance Manual:

Aircraft Maintenance Manual – PSM 1-8*x*-2

Maintenance Requirements Manual – PSM 1-8*x*-7:
Part 1 – MRB Report
Part 2 – Airworthiness Limitations

Hamilton Sundstrand Variable Pitch Aircraft Propeller 14SF-15, 14SF-23 Propeller System Maintenance Manual – P5197

(ii) Current service Information:

Service Bulletins supplied through www.iflybombardier.com

(iii) Illustrated Parts Catalogue:

PSM 1-82-4 – Dash 8 200 Series IPC
PSM 1-83-4 – Dash 8 300 Series IPC
PSM 1-84-4 – Dash 8 400 Series IPC

Hamilton Sundstrand Variable Pitch Propeller 14SF-11, -11E, 15, 23 Component Maintenance Manual with Illustrated Parts List 61-03-06

(7) Agreement from manufacturer to supply updates of data in (5), and (6):

Bombardier provides CAA access to www.iflybombardier.com

(8) Other information:

DHC-8-200 Detail Specification No. DS8-200 Issue 3 May 1996
DHC-8-300 Detail Specification No. DS8-300 Issue 4 May 1996
Aircraft Performance Summary – Dash 8 Model 311/314/315 Issue 2, March 1996
Dash 8 Series 300 Technical Description – Issue 02, September 1994
Detail Specification for the DHC-8-400 Series – DS8-400 Rev. 4 dated 06/01/2011

DHC-8 Series 200 Operating Data Manual – Document PSM 1-81-1
Dash 8 Series 300 Model 311/314/315 Operating Data Manual – Doc. PSM 1-83-1
Dash 8 series 100, 200, 300 MMEL and Procedures Manual – Doc. PSM 1-83-16/A

Aircraft Electrical Load Analysis – AEROC 84.6.E.2/4xxx dated May 2016

5. New Zealand Operational Rule Compliance

Compliance with the retrospective airworthiness requirements of Part 26 has been assessed for the DHC-8-200/300 Series, as they are a prerequisite for the grant of an airworthiness certificate. (The DHC-8-400 will comply on the basis of a later certification basis.)

CAR Part 26 – Subpart B – Additional Airworthiness Requirements

Appendix B – All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	FAR §25.811(a) Amdt 25-46 Eff Nov 13, 1978
B.2	Crew Protection Requirements - CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

Appendix C – Air Transport Aircraft – More than 9 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
C.1	Doors and Exits	FAR Part 25 §25.809(b) Amdt 25-46 Eff Nov 13, 1978
C.2.1	Additional Emergency Exits – per FAR 23.807(b) @ 10.5.93	Meets FAR Part 25 Certification requirements
C.2.2	Emergency Exit Evacuation Equipment – Descent means	FAR Part 25 §25.809(f) Amdt 25-46 Eff Nov 13, 1978
C.2.3	Emergency Exit Interior Marking – Size/self-illuminating	FAR Part 25 §25.811(e), Amdt 25-46 Eff Nov 13, 1978 FAR Part 25 §25.812(b) Amdt 25-46 Eff Oct 26, 1984
C.3.1	Landing Gear Aural Warning – Automatic Flap Linking	FAR Part 25 §25.729(e) Amdt 25-42 Eff Dec 5, 1991 *See Detailed Specification DS8-200 §31-50*

Appendix D – Air Transport Aircraft – More than 19 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
D.1.1	Exit Types – Shall be per FAR 25.807 @ 29.03.93	FAR Part 25 §25.807(g) Amdt 25-46 Eff Mar 29, 1982
D.1.2	Floor Level Exits – Definition	FAR Part 25 §25.807(a) Amdt 25-46 Eff Mar 29, 1982
D.2.1	Additional Emergency Exits – Must meet requirements	N/A – Doors are Type A (LH Front), Type II or Type III
D.2.2	Emergency Exit Access – All Required Exits must have: Passageway unobstructed 500m wide between areas and leading to a Type I or II Exit; Crew assist space; Access to Type III or IV Exit is unobstructed Internal doors must be able to be latched open – placarded	FAR Part 25 para §25.813 Amdt 25-46 Eff Nov 13, 1978 – See Detailed Specification DS8-200 Figure 1-3 for Interior Arrangement (Standard for DHC-8-100/200 Series for 37 passengers @ 31 in [787 mm] seat pitch.) N/A – No internal doors
D.2.3	Emergency Exit Operating Handles – Markings/Lighting	FAR Part 25 §25.811(e) Amdt 25-46 Eff Nov 13, 1978
D.2.4	Emergency Exit Evacuation Equipment – Descent means	FAR Part 25 §25.810(c) Amdt 25-47 Eff Oct 25, 1979
D.2.5	Emergency Exit Escape Route – Must be slip resistant	FAR Part 25 §25.803(e) Amdt 25-51 Eff Mar 6, 1980
D.2.6	Emergency Lightning (a) Switch Provisions; Uninterrupted Power; Last 10 min. (b) Descent Illumination – Automatic and Independent	 FAR Part 25 §25.812(f) Amdt 25-46 Eff Oct 26, 1984 FAR Part 25 §25.812(h) Amdt 25-46 Eff Oct 26, 1984
D.2.7	Emergency Interior Lighting – independent supply; min. illumination; incl. floor proximity escape path markings	FAR Part 25 para §25.812(c) and (e) Amendment 58 *See Detailed Specification DS8-200 Section 33-50*
D.2.8	Emergency Exterior Lighting – in effect 30.04.72 or later	FAR Part 25 §25.812(f) & (g) Amdt 25-46 Eff Oct 26, 1984
D.2.9	Emergency Exit Interior Marking – Clear; instructions Location signs above routes, by exits, on bulkheads Meet provisions in effect 30 April 1972, or later Minimum brightness 250 microlamberts	FAR Part 25 para §25.811 Amdt 25-46 Eff Nov 13, 1978 Bombardier previously advised for Series 300 that all exit signs are supplied by Honeywell (Grimes) and have a minimum brightness of 250 microlamberts.
D.2.10	Emergency Exit Exterior Markings – 2" contrasting band; opening instructions in red or bright chrome yellow;	FAR Part 25 para §25.811(f) Amdt 25-46 Eff Nov 13, 1978 (Type certificated after 1 May 1972)
D.3	Lavatory Fire Protection – Placards; Exterior ashtray; Waste Bin – Sealed door; built-in fire extinguisher; smoke detector system with external warning	AD DCA/GEN/7A (FAA AD 74-08-09R2); DCA/GEN/16 FAR Part 25 §25.791(d) Amdt 51 Eff Mar 6, 1980 – Toilet automatic fire extinguisher complies with TC ANO Series II No.30 and FAR 121.308 – *See Detailed Spec. DS8-200 Section 26-10*
D.4	Materials for Compartment Interiors – T/C after 1.01.58: (b) Manufactured 20/8/88 – 20/8/90 – Meet heat release requirements of FAR 25 at 20.08.86 increased to 100/100 Manufactured after 20/8/90 – Meet heat release rate and smoke tests of FAR Part 25 in effect 26.09.88 (c) Seat cushions (except flight deck) must be fireblocked	The cabin interior shall meet interior flammability requirements of FAR 25.853 Amendment 25-66 **DHC-8 Series 100 – Compliance to be determined** DHC-8 Series 200, 300 and 400 – Complies by cert. basis FAR §25.853(a-1) at Amdt 25-66 for Heat Release and FAR §25.853(c) at Amdt 25-66 for fireblocking
D.5	Cargo and Baggage Compartments – T/C after 1.01.58: (a) Each C or D compartment greater than 200 cu ft shall have liners of GFRS or meet FAR 25 in effect 29.03.93 (c) Liners shall be separate from the aircraft structure	N/A – Baggage Compartment is designated as Class B – *See Compliance Report AEROC 8.1.AC.3* (The lining is of fibre reinforced plastic (FRP) to protect the rear fuselage structure. See DS8-200 Section 25-50 – Also meets the requirements of FAR 25.853(b))

Compliance with the following additional NZ operating requirements has been reviewed and were found to be covered by either the original certification requirements or the basic build standard of the DHC-8-200/300/400 Series aircraft, except as noted:

Civil Aviation Rules Part 91

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:		MEANS OF COMPLIANCE:	
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training		FAR Part 25 §25.785 Amdt 25-51 Eff 6 March 1980 – Crew inertial reel harness fitted as standard – *See DS8-200 §25-10*	
91.507	Pax Information Signs – Smoking, safety belts fastened		FAR Part 25 §25.791 Amdt 25-51 Eff Mar 6, 1980 – Fitted as Standard – *See Detailed Spec. DS8-200 Section 11-30*	
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	FAR 25.1303(b)(1)/*DSFig.39-1* FAR 25.1303(b)(1) – *N/A* FAR 25.1303(b)(2)/*DS Fig.39-1* FAR25.1303(a)(3) FAR 25.1305(a)(2)/*DS §28-40* FAR 25.1305(c)(3)/*DS §77-00* FAR 25.1305(a)(4)/*DS §77-00*	(8) Coolant Temp (9) Oil Temperature (10) Manifold Pressure (11) Cylinder Head Temp. (12) Flap Position (13) U/C Position (14) Ammeter/Voltmeter	Not Applicable – Turboprop FAR 25.1305(a)(6)/*DS §77-00* Not Applicable – Turboprop Not Applicable – Turboprop *See DS8-200 §27-50* *See DS8-200 §32-60* FAR 25.1351(6)/*DS §24-20*
	DHC-8-400 The aircraft is equipped with an Electronic Flight Instrument System (EFIS) and Engine and System Integrated Displays (ESID) consisting of five Liquid Crystal Displays (LCDs) located in the instrument panel.			
91.511 Night	(1)Turn and Slip (2) Position Lights	FAR 25.1303(b)(4) FAR 25.1389/*DS8-200 §33-40*	(3) Anti-collision Lights (4) Instrument Lighting	FAR 25.1401/*DS8-200 §33-40* *See DS8-200 §33-00*
91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	Dual EFIS- *See DS8-200 Fig.39-1* FAR 25.1303(b)(6)/*DS Fig.39-1* FAR 25.1331(a) FAR 25.1303(b)(2)	(5) OAT (6) Time in hr/min/sec (7) ASI/Heated Pitot (8) Rate of Climb/Descent	FAR 25.1303(a)(1) FAR25.1303(a)(2) *See DS8-200 §30-30* FAR 25.1303(b)(3)
91.519	IFR Communication and Navigation Equipment	Dual VHF fitted as standard – *See DS8-200 §23-10* [King KTR-908 or Collins VHF-22 Systems] Dual VOR/ILS fitted as standard – *See Detailed Specification DS8-200 §34-50* [King KNR-634 or Collins VIR-32A VHF Navigation Systems] Single ADF and DME fitted as standard – *See Detailed Specification DS8-200 §34-50* [King KDF-806 or Collins ADF-60 Systems]		
91.523	Emergency Equipment: (a) More Than 10 pax – First Aid Kits per Table 7 – Fire Extinguishers per Table 8 (b) More than 20 pax – Axe readily acceptable to crew (c) More than 61 pax – Portable Megaphones per Table 9		***Operating Rule – Compliance to be determined*** 3 Halon-type fitted as standard – *See DS8-200 §26-20* Fitted as standard – *See Detailed Spec. DS8-200 §25-60* N/A – Max. number of occupants per Type Certificate is 44	
91.529	ELT - TSO C91a after 1/4/97 (or replacement)		ELT fitted as standard - *See DS8-200 §25-60*	
91.531	Oxygen Indicators – Volume/Pressure/Delivery		FAR Part 25 §25.1441 through 25.1450 System pressure is shown on co-pilot's side console gauge.	
91.535	Oxygen for Pressurised Aircraft: (1) Flight Crew Member On-Demand Mask; 15 min PBE (2) 1 Set of Portable 15 min PBE (3) Crew Member - Pax Oxygen Mask; Portable PBE 120l (4) Spare Oxygen Masks/PBE (5) Min Quantity Supplement Oxygen (6) Required Supplemental/Therapeutic Oxygen Above FL250 – Quick-Donning Crew On-Demand Mask – Supplemental O_2 Masks for all Pax/Crew – Supplemental Mask in Washroom/Toilet Above FL300 – Total Outlets Exceed Pax by 10% - Extra Units Uniformly Distributed, auto presentation of pax masks above FL140 with manual alternative		*See Detailed Specification DS8-200 §35-10* *CREW – Sufficient O_2 provided for descent FL250-FL140 in 4 minutes and continue at FL140 for 116 minutes.* *PAX – Sufficient O_2 provided for 10% of pax. for descent FL250-FL140 in 4 minutes and continue at for 26 minutes.* Oxygen System Description – PSM 1-82-1 §11.20 Crew has fixed and portable systems. Oxygen masks are quick donning type. One portable cylinder with mask. Only portable system is provided for passengers, consisting of two dual-outlet cylinders and four masks. A portable cylinder for first aid use only is also provided. N/A – Maximum operating altitude 25,000 feet (See AFM)	
	DHC-8-400 – Oxygen is provided for the flight crew to descend from its max operating altitude of 25 000 ft. to 13 000 ft. in 4 minutes and to continue at altitudes above 10 000 ft. for a further 116 minutes. The minimum mass flow rates meet FAR §25.1443(b) requirements. The type certificated configuration installs three 11 cu. Ft. oxygen cylinders, each fitted with constant flow type regulators and three TSO C64a qualified masks.			
91.541	SSR Transponder and Altitude Reporting Equipment		Single ATC Tx system fitted as standard – *See DS §34-50*	
	DHC-8-400A Dual Mode S Transponder system installed which meets TSO C112 – See Avionics equipment list.			
91.543	Altitude Alerting Device – Turbojet or Turbofan		Altitude alerting system fitted as std (See DHC email 7/6/03)	
91.545	Assigned Altitude Indicator		Not Applicable – See Above	
A.15	ELT Installation Requirements		***To be determined on an individual aircraft basis***	

Civil Aviation Rules Part 121

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:		MEANS OF COMPLIANCE:
121.355	Additional Instruments (Powerplant and propeller)		FAR Part 25 is a Part 21 Appendix C standard. Range lights are provided to indicate propeller blade angles in the ground operating range – *See DS8-200 §61-40*
121.357	Additional Eqpt – Windscreen Wiper, Door, Key, Placard		*See DS8-200 §30-40, §52-10 and Not Applicable*
121.359	Night Flight – Landing Light, Light in each pax cabin		FAR §25.1383 – *See DS8-200 §33-20 and §33-40*
121.361	IFR Operations	Speed, Alt, spare bulbs/fuses	Dual heated pitot fitted as standard – *See DS8-200 §30-30*
121.363	Flights over water	Liferafts	***Operating Rule – Compliance to be determined***
121.365	Emergency Equipment	Per §91.523 and EROPS kit	***Operating Rule – Compliance to be determined***
121.367	Protective Breathing Equipment (PBE)	TSO C99 cockpit equipment TSO C115 cabin equipment	***PBE required to be furnished by buyer (See DS8-200 §35-20) – NZ Compliance to be determined***
121.369	Pax Address, Intercom	Meets FAR § 121.318 and 319.	FAR §25.1423 – *See Detailed Spec DS8-200 Section 23-30*
121.371	Cockpit Voice Recorder Appendix B.5 requires TSO C84/C123	CVR meeting ARINC 557 fitted as standard – *See DS8-200 §23-70* [Sundstrand AV-557C standard – 2 hr CVR Optional under CR823CH00216]	
	DHC-8-400: A solid-state CVR with a 2-hour recording capacity which complies with Eurocae ED 56A shall be installed.		
121.373	Flight Data Recorder Appendix B.6 requires TSO C124	FDR meeting ARINC 573/717 fitted as standard. – *See DS8-200 §31-30* *Parameters recorded detailed in Boeing Canada Engineering Order 82814*	
	DHC-8-400: A solid state FDR system (ED 55 and ARINC 717) consisting of a recorder and appropriate sensors shall be installed. The system shall record parameters to meet FAR 25.1459 and JAR 25.1459 requirements.		
121.375	Additional Attitude Indicator	Fitted as Standard – *See Detailed Spec. DS8-200 Fig.39-1*	
121.377	Weather Radar Appendix B.8 requires TSO C63	Wx [Primus 660 or 800] fitted as standard – *See DS8-200 §34-40* Q400: Honeywell X-band, digital Primus P-660 Weather Radar RTA installed	
121.379	Ground Proximity Warning System Appendix B.9 requires TSCO C92	Sundstrand Mark II GPWS fitted as standard – *See DS8-200 §31-50* [Honeywell Mk VIII EGPWS available as an option]	

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was directly equivalent to the CAR requirement, and compliance is achieved for the basic aircraft type design by certification against the original Design Rule.

2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

3. Some means of compliance above are specific to a particular model/configuration. Compliance with Part 91/119 operating requirements should be checked in each case, particularly oxygen system capacity and emergency equipment.

Attachments

The following documents form attachments to this report:

Photographs first-of-type example DHC-8-202 s/n 475 ZK-ECR
Photographs first-of-type example DHC-8-311 serial number 374 ZK-NER
Three-view drawing de Havilland Inc. DHC-8 Series 200
Three-view drawing de Havilland Inc. Model Dash-8 Series 300
Three-view drawing Bombardier DHC-8 Series 400
Copy of Transport Canada TCDS Number A-142

Sign off

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David Gill — Checked – Greg Baum

Team Leader Airworthiness — Airworthiness Engineer

Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
DHC-8-102	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
DHC-8-311	Ansett New Zealand	0/21B/11	4 March 2000
DHC-8-202	Air National Corporate Ltd	3/21B/32	6 June 2003
DHC-8-402	NAI National Ltd	17/21B/2	26 July 2018