Type Acceptance Report TAR 0/21B/16 – Revision 1 Short SD3-60

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	1
2. ICAO TYPE CERTIFICATE DETAILS	1
3. TYPE ACCEPTANCE DETAILS	2
4. NZCAR §21.43 DATA REQUIREMENTS	3
5. ADDITIONAL NEW ZEALAND REQUIREMENTS	5
ATTACHMENTS	7
APPENDIX 1	7

Executive Summary

New Zealand Type Acceptance has been granted to the Short SD3-60 Series based on validation of UKCAA Type Certificate BA11 and FAA Type Certificate A41EU. 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 §21.177, 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).

1. Introduction

This report details the basis on which Type Acceptance Certificate No.0/21B/16 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 models in New Zealand; and
- (b) Identify any special conditions for import applicable to any models 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.

All models covered by the type acceptance certificate issued under Part 21B are listed in Section 2 of this report.

2. ICAO Type Certificate Details

Manufacturer: Short Brothers PLC

Type Certificate: BA11 A41EU

Issued by: UK Civil Aviation Authority Federal Aviation Administration

Model(s): SD3-60 Variant 100 SD3-60 Variant 200

MCTOW 26,000 lb [11,793 kg] 26,000 lb [11,793 kg]

 26,453 lb [11,999 kg](Mod 7544)
 26,453 lb [11,999 kg](Mod 7544)

 27,100 lb [12,292 kg](Mod A8096)
 27,100 lb [12,292 kg](Mod A8096)

Max. No. of Seats: 43 Occupants 39 Passengers (plus crew)

Engines: Pratt & Whitney Canada PT6A-65R/-65AR (SB Mod 7543)

Type Certificate: E12 (FAA E4EA)
Issued by: Transport Canada

Pratt & Whitney Canada PT6A-67R (SB Mod A8077)

Type Certificate: E21 (FAA E26NE)
Issued by: Transport Canada

Propellers: Hartzell HC-B5MP-3C/M10876ASK (PT6A-65R or -65AR)

Type Certificate: P44GL

Issued by: Federal Aviation Administration

Hartzell HC-A6A-3/A10460E (post SB Mod A8059) (PT6A-67R)

Type Certificate: P14NE

Issued by: Federal Aviation Administration

3. Type Acceptance Details

The application for New Zealand type acceptance was from Royal Tongan Airlines dated 26th January 2000. The airline has imported a Variant 100 serial number SH 3693 for operation on the Tongan Register as A3-BFK, but has contracted the CAA to provide certification services. (The SD3-60 comes in four variants, depending on which was the type certificating country.)

Type Acceptance Certificate No. 0/21B/16 was granted on 3 April 2000.

The Shorts SD3-60 "360" is a stretched version of the SD3-30 "330" commuter aircraft with a three-foot plug forward of the wing and more powerful PT6A-65R/AR engines. The other major change is the adoption of a conventional single tail. The prototype 360 s/n SH.3600 flew on 1st June 1981 and the final production aircraft was s/n SH.3764. (The 330 was itself derived from the Model SC.7 Skyvan/Skyliner 22-seat aircraft, by means of an extended fuselage, wings and struts, PT6A-45 engines and an undercarriage that retracted into enlarged sidepods.)

SH3693 was delivered in 1986 as a Variant 200. From April 1997 it was operated in the Bahamas under UK CAA jurisdiction and was supplied with a Variant 100 Flight Manual by Shorts. (Service Bulletin SB360-25-54 covers conversion of a Variant 200 to a Variant 100, and was raised to Rev.2 Mar.2000 to include s/n SH3693.) The changes are minor, involving replacement of the (internal and external) dataplates, emergency exit notices and emergency "Break-In Markings", ASI and airspeed limitations placard and the Flight Manual.

This Report was raised to Revision 1 to include the SD3-60 Variant 200, and to update the format of the report. Aircraft serial number SH3693 was exported from Tonga to American Samoa in 2005, converted back to a Variant 200, and placed on the US civil aircraft register. The aircraft was subsequently imported into Samoa by South Pacific Express Ltd, who have proposed keeping it as a Variant 200 to maintain commonality with the operating procedures the crews are familiar with.

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) ICAO Type certificate:

UK CAA Aircraft Type Certificate No. BA 11 for Type SD 3 issued 9 February 1976 UK CAA Type Certificate Data Sheet No.BA11 – Issue 13, March 2006 FAA Type Certificate Data Sheet A41EU at Revision 13 dated 21 March 2007

Transport Canada TCDS No. E12 for P&WC PT6A Series at Issue 20 dated May 23, 2007 FAA Type Certificate Data Sheet E4EA at Revision 24 dated 21 June 2007

Transport Canada TCDS No. E21 for P&WC PT6A Series at Issue 15 dated September 20, 2007 FAA Type Certificate Data Sheet E26NE at Revision 13 dated 19 November 2007

FAA TCDS No. P44GL for Hartzell HC-B5M at Revision 11 dated December 19, 2006 FAA TCDS No P14NE for Hartzell HC-A6A at Revision 1dated 10 August 1990

Airworthiness design requirements:

(i) Airworthiness Design Standards:

The certification basis of the Shorts SD3-60 is BCAR Sections C (Engines and Propellers) at Issue 7, D (Aeroplanes) Issue 13, J (Electrical) at Issue 3, N (Noise) at Issue 2 and R (Radio) at Issue 4, plus BCAR Blue Papers and BCAR Preliminary and Working Draft Papers as detailed in the TCDS. FAA certification is to Part 25 including Amendments 25-1 through 25-34, and Special Conditions No.25-70.EU22 with Amendment 1 dated 11 June 1976. SFAR 27 effective 1 January 1975.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as BCAR Section D is equivalent to FAR Part 25 which is the basic standard for Transport Category Airplanes called up under Part 21 Appendix C. There are no non-compliances and no special conditions have been prescribed by the Director under §21.23.

Special Conditions:

FAA Docket No.15779 - Special Conditions No. 25-70-EU-22 for Short Model SD3-30 These included Engine Ignition System and Operation without Normal Electrical Power for 5 min.s VFR. Amendment 1 specified minimum climb gradient with the APC system failed, prescribes system reliability and status monitoring requirements and mandates installation of an independent engine failure warning.

(ii) Equivalent Level of Safety Findings:

UK CAA Letter 9/30/10GJ dated 12th August 1982 – Omission of DV Window Equivalent safety was granted on the basis of having an openable sidewindow, and because the main flight deck windscreens are shatterproof and have satisfactory resistance to damage from bird impact.

(iii) Airworthiness Limitations:

Chapter 5 of the Maintenance Manual 360/MM.

(2) Aircraft Noise and Engine Emission Standards:

Noise Standard: FAR 36 including Amendments 36-1 through 36-20

(3) Certification Compliance Listing:

Short Brothers PLC – SD3-60 CAA/FAA Compliance Check List Doc. Ref. SD3-60-CCL-001 at Issue 4 dated November 1990

(4) Flight Manuals:

UK CAA-Approved Flight Manual for the SD3-60 Variant 100 Short Brothers PLC Document No. SB.4.7 - CAA Accepted as AIR 2692

UK CAA and FAA-Approved Flight Manual for the SD3-60 Variant 200 Short Brothers PLC Document No. SB.4.6 - CAA Accepted as AIR 3035

Operating Data for Aircraft, Engine and Propeller:

(i) Maintenance Manual:

Shorts SD3-60 Maintenance Manual – (Rev 31) (CD Issue 2 July 2003) Shorts SD3-60 Maintenance programme – (Rev 10) (CD Issue 2 July 2003) PT6A-65B/R/AR/AG Maintenance Manual P/N 3032842 Hartzell Five-Blade (HC-B5M series) Overhaul Manual No. 132A

(ii) Current service Information:

Shorts SD3-60 Information Letters and Service Bulletins – Microfiche PT6A-65B/R/AG Series Service Bulletins Spare Parts Bulletins and Service Information Letters

Propeller Owner's Manual Series HC-B3, B4, B5M, A3 Series Manual No. 139

(iii) Illustrated Parts Catalogue:

Shorts SD3-60 IPC – (Rev 15) (CD Issue 2 July 2003) PT6A-65AG/AR/B/R Parts Catalog P/N 3032844

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

CAA 2171 form from Short Bros Head of Tech. Pubs and Maint dated 15/3/00 Email from L. Rutherford, P & WC Publications dated 23 March 2000.

(6) Other information:

Shorts SD3-60 Crew Manual – Publication Ref. 360/CM
Short Brothers PLC CAA Approved MMEL
Operational and Maintenance Proceedings (MMEL) — Publication

Operational and Maintenance Procedures (MMEL) – Publication Ref SD3/O&MP Shorts SD3-60 Type Specification Ref. SD360-127 – Issue 6 dated July 1985

5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 is a prerequisite for the grant of a type acceptance certificate.

Civil Aviation Rules Part 26

Subpart B - Additional Airworthiness Requirements

Appendix B - All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	BCAR Section D Chapter D4-3 paragraph 4.2.7(c) and (e)
B.2	Crew Protection Requirements - CAM 8 Appdx. B # .35	Agricultural Aircraft – Not Applicable

Appendix C - Air Transport Aircraft - More than 9 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
C.1	Doors and Exits	BCAR Section D Chapter D4-3 paragraph 4.1
C.2.1	Additional Emergency Exits - per FAR 23.807(b) @ 10.5.93	Sub-paragraph (3) applies (FAR Part 25 certificated)
C.2.2	Emergency Exit Evacuation Equipment – Descent means	N/A – No overwing exits or exits more than 2m from ground
C.2.3	Emergency Exit Interior Marking - Size/self-illuminating	BCAR Section D Chapter D4-3 paragraph 4.4.2(a)
C.3.1	Landing Gear Aural Warning - Automatic Flap Linking	BCAR Section D Chapter D4-5 paragraph 2.4

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	Shorts SD3-60 is type certificated to FAR Part 25
D.1.2	Floor Level Exits – Definition	Shorts SD3-60 is type certificated to FAR Part 25
D.2.1	Additional Emergency Exits - Must meet requirements	SD3-60 is FAR 25 type certificated – No ventral/tailcone exits
D.2.2	Emergency Exit Access - All Required Exits must have: Passageway unobstructed 500mm wide between areas and	BCAR Section D Chapter D4-3 paragraph 4.2.5(a)
	leading to a Type I or II Exit; Crew assist space;	BCAR Section D Chapter D4-3 paragraph 4.2.5(c) BCAR Section D Chapter D4-3 paragraph 4.2.5(d)
	Access to Type III or IV Exit, Crew assist space,	
	Internal doors must be able to be latched open – placarded	BCAR Section D Chapter D4-3 paragraph 4.2.5(e) and (f) BCAR Section D Chapter D4-3 paragraph 4.2.5(g)
D.2.3	Emergency Exit Operating Handles - Markings/Lighting	1 1 0 1 0
		BCAR Section D Chapter D4-3 paragraph 4.2.7(d)
D.2.4	Emergency Exit Evacuation Equipment – Descent means	BCAR Section D Chapter D4-3 paragraph 4.3.1
D.2.5	Emergency Exit Escape Route - Must be slip resistant	BCAR Section D Chapter D4-3 paragraph 4.3.2
D.2.6	Emergency Lightning	DCARG (C DCI (DA2 1440
	(a) Switch Provisions; Uninterrupted Power; Last 10 min.	BCAR Section D Chapter D4-3 paragraph 4.4.8
	(b) Descent Illumination - Automatic and Independent	BCAR Section D Chapter D4-3 paragraph 4.4.5
D.2.7	Emergency Interior Lighting - independent supply; min.	BCAR Section D Chapter D4-3 paragraph 4.4.3
	illumination; incl. floor proximity escape path markings	Compliance with CAA Airworthiness Notice No.58 is basic
		on SH 3699 and sub. (See Shorts Declaration of Design and
		Performance ES/Misc/61) Shorts SB SD360-33-14 introduced
D 2 0	F	floor path lighting for earlier aircraft.
D.2.8	Emergency Exterior Lighting - in effect 30.04.72 or later	Shorts SD3-60 type certificated after 1 May 1972
D.2.9	Emergency Exit Interior Marking - Clear; instructions	BCAR Section D Chapter D4-3 paragraph 4.2.7(a)
	Location signs above routes, by exits, on bulkheads	BCAR Section D Chapter D4-3 paragraph 4.2.7(c)
	Meet provisions in effect 30 April 1972, or later	Shorts SD3-60 type certificated after 1 May 1972
	Minimum brightness 250 microlamberts	BCAR Section D Chapter D4-3 paragraph 4.4.2(a)(ii)
D.2.10	Emergency Exit Exterior Markings - 2" contrasting band;	BCAR Section D Chapter D4-3 paragraph 4.2.7(e)(ii)
	opening instructions in red or bright chrome yellow;	BCAR Section D Chapter D4-3 paragraph 4.2.7(e)(iii)
D.3	Lavatory Fire Protection - Placards; Exterior ashtray;	Complies from Serial Number SH 3716 and subsequent.
	Waste Bin - Sealed door; built-in fire extinguisher; smoke	For earlier aircraft Shorts Service Bulletin SD360-26-06
L .	detector system with external warning	installs automatic fire extinguisher.
D.4	Materials for Compartment Interiors - T/C after 1.01.58:	Shorts SD3-60 type certificated after 1 January 1958:
	(b) Manufactured 20/8/88 - 20/8/90 - Meet heat release	N/A to FoT aircraft – manufactured on March 1986
	requirements of FAR 25 at 20.08.86 increased to 100/100	
	Upon substantial replacement, meet FAR 25 @ 29.3.93	To be complied with as applicable
	(c) Seat cushions (except flightdeck) must be fireblocked	Standard Aircraft Furnishings seats comply after 1987 (F
		suffix P/N.) For earlier seats Shorts SB SD360-25-06 covers
D.5	C T/C -f 1 01 50	retrofit.
D.5	Cargo and Baggage Compartments - T/C after 1.01.58:	Shorts SD3-60 type certificated after 1 January 1958:
	(a) Each C or D compartment greater than 200 cu ft shall have	N/A – Forward and Aft (Class D) baggage compartments
	liners of GFRS or meet FAR 25 in effect 29.03.93	have volumes of 100 and 170 cu.ft., respectively.
	(c) Liners shall be separate from the aircraft structure	BCAR Section D Chapter D4-3 paragraph 6.2.1(c)

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 aircraft, except as noted:

Civil Aviation Rules Part 91 Subpart F - Instrument and Equipment Requirements

PARA:	REQUIREMENT:		MEANS OF COMPLIANCE:	
91.505			BCAR Section D Chapter D6-1 paragraph 5.11 Both pilots have inertial-reel harness – See SD360-127 §19.2.4.1	
91.507	Pax Information Signs -	Smoking, safety belts fastened	BCAR Section D Chapter I	
			BCAR Section D Chapter I	1 0 1
91.509	(1) ASI	BCAR Chapter D6-1 para 4.1.1	(8) Coolant Temp	N/A – Turbine powered
Min. VFR	(2) Machmeter	- See Crew Manual §1-14 para 4 N/A	(9) Oil Temperature	BCAR Chapter D6-1 para 4.2.1(g) -See Crew Manual §1-16 para 9
VIK	(3) Altimeter	BCAR Chapter D6-1 para 4.1.2	(10) Manifold Pressure	N/A – Turbine powered
	(3) Alumeter	- See Crew Manual §1-14 para 2	(11) Cylinder Head Temp.	N/A – Turbine powered
	(4) Magnetic Compass	BCAR Chapter D6-1 para 4.1.3	(12) Flap Position	BCAR Chapter D4-8 para 3.2
	(1) Magnetic Compass	- See Crew Manual §1-14 para 7	(13) U/C Position	BCAR Chapter D4-5 para 2.3
	(5) Fuel Contents	BCAR Chapter D6-1 para 4.2.1(b)	(, -,	- See Crew Manual §1-12 para 2.C
	(6) Engine RPM	BCAR Chapter D6-1 para 4.2.3(a)	(14) Ammeter/Voltmeter	Fitted as standard in Panel 4P
	(7) Oil Pressure	BCAR Chapter D6-1 para 4.2.1(d)		– See Crew Man §1-04 para 1.B.6
			(15) CO Meter	N/A -
91.511	(1)Turn and Slip	BCAR Chapter D6-1 para 6.1.3	(3) Anti-collision Lights	BCAR Chapter D6-7 para 5
Night	(2) Position Lights	BCAR Chapter D6-1 para 6.1.1	(4) Instrument Lighting	BCAR Chapter D6-1 para 6.1.2
91.517	(1) Gyroscopic AH	BCAR Chapter D6-1 para 6.3.2	(5) OAT	BCAR Chapter D6-1 para 6.3.9
IFR		HIS-70 fitted as std – See CM §1-14		- See Crew Manual §1-14 para 6
	(2) Gyroscopic DI	BCAR Chapter D6-1 para 6.3.3	(6) Time in hr/min/sec	BCAR Chapter D6-1 para 6.3.7
	(2) C D C1	ADI-84A fitted as std – See CM §1-14	(7) ASI/Heated Pitot	Fitted as std - See CM §1-10 para 7 BCAR Chapter D6-1 para 6.3.6
	(3) Gyro Power Supply (4) Sensitive Altimeter	BCAR Chapter D6-1 para 6.3.4 BCAR Chapter D6-1 para 6.3.5	(8) Rate of Climb/Descent	- See Crew Manual §1-14 para 3
91.519	IFR Communication and	1 1	Dual Collins VHE 20 fitted	l as std – See SD360-127 §13.2.1
71.317	If K Communication and	i Navigation Equipment		ingle ADF-60 fitted as standard – See
			Type Specification SD360-127 Section 13.3	
91.523	(a) More Than 10 pax -	First Aid Kits per Table 7	First Aid Kit fitted as stand	ard – See SD360-127 §19.3.3.12
Emergcy		Fire Extinguishers per Table 8	3 hand fire extinguishers fitted as std – See SD360-127 §17.3	
Eqpmt.		Axe readily acceptable to crew	Axe fitted as standard – See SD360-127 §19.2.5(ii)	
	(c) More than 61 pax - Portable Megaphones per Table 9		N/A – Maximum certificated number of occupants is 43	
91.529	ELT - TSO C91a after 1		To be determined on an individual aircraft basis	
91.531	Oxygen Indicators - Volume/Pressure/Delivery		No integrated oxygen syste	
91.533	>30 min above FL100 - Supplemental for crew, 10% Pax		Maximum operating altitude of Shorts SD3-60 is 20,000 feet	
Unpress.			(Standard installation is a Scott '5500' 40-minute supply	
A/c	Above FL100 - Supplemental for all Crew, Pax - Therapeutic			
91.541	for 1% of Pax - 120l PBE for each crew member SSR Transponder and Altitude Reporting Equipment		Mk.1 portable 185 min. unit is fitted in the cabin.) Dual Collins TDR-90 fitted as standard – See SD360-127	
91.341	SSK Transponder and A	initiac Reporting Equipment	\$13.3.4	i as stanuaru – see sidsou-12/
91.543	Altitude Alerting Device	- Turbojet or Turbofan	N/A – Turboprop aircraft	
91.545	Altitude Alerting Device - Turbojet or Turbofan Assigned Altitude Indicator		To be determined on an individual aircraft basis	
A.15	ELT Installation Requirements		To be determined on an individual aircraft basis	
	require		2000 were mines on an in	ar. ar. ar cruje ouses

Civil Aviation Rules Part 121

Subpart F - Instrument and Equipment Requirements

Note: Shorts SD3-60 is a Part 121 aircraft on the basis of Design payload = 3765 kg (8300 lb), and Maximum number of passengers = 39 (per FAA Type Certificate)

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
121.355	Additional Instruments (Powerplant)	Aircraft certified to FAR Part 25 - a Part 21 Appendix C
		standard
121.357	Additional Equipment – (1) Windscreen Wiper or equiv.	BCAR Section D Chapter D4-2 paragraph 3.1.3
	(2) Lockable door, (3) Available key, Placard - t/o & ldg	To be determined on an individual aircraft basis
121.359	Night Flight - Landing Light, Light in each pax cabin	BCAR Section D Chapter D6-1 paragraphs 6.2.2 and 6.2.4

121.361	IFR Operations (a) Second independent Speed,		econd independent Speed,	Dual heated pitot fitted as standard – See SD360-127 §18.3
	Altit		ıde	BCAR Section D Chapter D6-1 paragraph 4.3.3
		(b) S	pare bulbs/fuses	
121.363	Flights over water		Liferafts	Operating Rule - Compliance to be determined by Operator
121.365	Emergency Equipn	nent	Per §91.523 and EROPS kit	Operating Rule - Compliance to be determined by Operator
121.367	Protective Breathin	ıg	TSO C99 cockpit equipment	Operating Rule - Compliance to be determined by Operator
	Equipment (PBE)		TSO C116 cabin equipment	
121.369	Pax Address, Interc	com	Meets FAR § 121.318 and 319.	Collins 346 Audio/PA system std fit - See SD360-127 §13.4/5
121.371	Cockpit Voice Recorder – App. B.5 requires TSO		– App. B.5 requires TSO	Fairchild A-100A fitted as standard – See SD360-127 §13.1.1
	C84/C123			
121.373	Flight Data Recorder - Appendix B.6 requires TSO C124		ppendix B.6 requires TSO C124	Plessy PV.1584G fitted as standard – See SD360-127 §13.1.1
121.375	Additional Attitude Indicator		ator	Standby attitude gyro fitted as standard – See SD360-127
				Fig.14.2
121.377	Weather Radar - Appendix B.8 requires TSO C63		ix B.8 requires TSO C63	Collins WXR220 fitted as standard – See SD360-127 §13.3.5
121.379	Ground Proximity Warning System		ng System	Sundstrand Mk.2 fitted as standard – See SD360-127 §13.1.1
	Appendix B.9 requires TSO C92		SO C92	
121.381	TAWS Class A to TSO C151a or C151b		C151a or C151b	To be determined on an individual aircraft basis
121.383	ACAS II to TSO C119b			To be determined on an individual aircraft basis

Attachments

The following documents form attachments to this report:

Three-view drawing Short SD3-60 Copy of CAA Type Certificate Data Sheet Number BA11 Copy of FAA Type Certificate Data Sheet Number A41EU

Sign off

Peter Gill	Checked – AWE
Airworthiness Engineer	Date: 2 May 2008

Appendix 1

List of Type Accepted Variants:

Model:	Applicant:	CAA Work Request:	Date Granted:
SD3-60 Variant 100	Royal Tongan Airlines	0/21B/16	3 April 2000
SD3-60 Variant 200	South Pacific Express Ltd	8/21B/28	2 May 2008