Type Acceptance Report

TAR 9/21B/16 – Revision 1

CESSNA 680 Series

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Executive Summary

New Zealand Type Acceptance has been granted to the Cessna 680 Series based on validation of FAA Type Certificate number T00012WI. There are no special conditions 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).

NOTE: Information in this report is correct as at the date of issue. The report is 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 applicable State-of-Design Type Certificate Data Sheet.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 9/21B/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 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.

2. State of Design Type Certificate Details

TC Holder:	Cessna Aircraft Company	(up to 29 July 2013)
	Textron Aviation Inc.	(s/n 680-0548 and on) (all 680A except s/n 680A-005)
Type Certificate:	T00012WI	
Issued by:	Federal Aviation Administration	

Model:	680 Sovereign
MCTOW	30,300 lb. [13,744 kg] (s/n 680-0001 thru 680-0349) 30,775 lb. [13,959 kg] (s/n 680-0501 and on)
Max. No. of Seats:	14 (two crew plus 12 passenger seats)
Noise Standard:	FAR 36 (Stage 4)
Engine:	Pratt & Whitney Canada PW306C (s/n 680-0001 thru 680-0349) Pratt & Whitney Canada PW306D (s/n 680-0501 and on) Type Certificate: E-22 Issued by: Transport Canada (FAA Type Certificate E35NE)

Model:	680A Latitude
MCTOW	30,800 lb. [13,970 kg.]
Max. No. of Seats:	11 (two crew plus 9 passenger seats)
Noise Standard:	FAR 36 (Stage 4)
Engine:	Pratt & Whitney Canada PW306D1 Type Certificate: E-22 Issued by: Transport Canada Type acceptance of the PW306 Series engines was completed separately under CAA Work Request 10/21B/8.

3. Type Acceptance Details

The application for New Zealand type acceptance of the Cessna 680 Sovereign was from the manufacturer Cessna Aircraft Company, dated 2009. The first-of-type example was serial number 680-0058, registered as ZK-JTH. The Cessna 680 is an aft-mounted twin-turbofan pressurised executive jet with provision for up to twelve passengers.

Type Acceptance Certificate Number 9/21B/16 was granted on 24 November 2009 to the Cessna Model 680 based on validation of FAA Type Certificate number T00012WI. Specific applicability is limited to the coverage provided by the operating documentation supplied. (Type acceptance of the PW306 Series engine by validation of Transport Canada type certificate E-22 was completed under CAA Work Request number 10/21B/8.)

This report was raised to Revision 1 to include the 680 Sovereign+ and 680A Latitude models. The application was from the type certificate holder dated 27 May 2015. Type Acceptance of the Models 680 (s/n 680-0501 and on) and 680A Latitude was granted on 14 December 2015. As part of the validation process a team from the Aircraft Certification Unit visited Cessna for a Familiarisation Visit.

The Model 680, marketed as the Citation Sovereign, was an all-new design of mid-size intercontinental business jet of conventional all-metal construction. It is the second largest of the Cessna Citation range fitting between the Citation XLS and the Citation X. The fuselage is based on the Citation XLS but stretched by 4.9 ft with an all-new mildly swept supercritical wing. The wing design is optimised to provide short take-off and landing distances. The cockpit uses the Honeywell EPIC electronic avionics/instrument system with four 8 x 10 inch LCD Displays. The aft-mounted 5,770 lb. thrust PW306C engines are FADEC-equipped. The aircraft has a Honeywell RE100 APU installed in the rear fuselage stinger. V_{MO}/M_{MO} is 305 KCAS/0.80M and maximum operating altitude is 47,000 feet. The Model 680 Sovereign is approved for flight into known icing conditions.

The Model 680 Sovereign+ is the marketing name for the serial number range 680-0501 and up, which was the first major Block Point Change (BPC) for the Model 680. The most significant changes were installation of higher thrust PW306D engines with autothrottle, a 475 lb. increase in MCTOW, the fitting of extended span winglets and the adoption of the Garmin G5000 avionics system with touch-screen controls. The intent of the upgrades was to increase range to over 3000 NM (by fitting winglets, an increase in fuel quantity, and an improvement in engine SFC); improved cabin cooling (new heat exchanger with ducting improvements); better takeoff performance (wet runway improvements and V_{MCG} reduction achieved through a 4º outboard cant of the engine nozzles); and an interiors upgrade (restyled passenger seats and a new “Clairity” cabin management system).

The Model 680A Latitude is essentially the Model 680+ fitted with an all-new fuselage of larger diameter (83.75” versus 72.5”), along with an increase in cabin pressure differential. Changes to structure and systems were minimised, but other major new features include an electrically-operated main entry door; new area-ruled tailcone with strakes; and changes to the engine pylon, nose and nose gear wheelwell, and wing-to-fuselage fairings.

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:

(1) State of Design Type certificate:

FAA Type Certificate Number T00012WI

FAA Type Certificate Data Sheet no. T00012WI at Revision11 dated July 29, 2015
– Model 680 Sovereign approved June 2, 2004
– Model 680 Sovereign (s/n 680-0501 and on) approved December 13, 2013
– Model 680A Latitude approved June 5, 2015

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:

The certification basis of the Cessna 680 is FAR Part 25 effective 1 February 1965, including Amendments 25-1 through 25-98. For FAA certification, there were two special conditions, two exemptions and thirteen findings of equivalent safety were made. These have been reviewed and accepted by the CAA.

For the "680+" the certification basis was updated to Amendment 25-129 for those areas that are significantly changed. (See specific paragraphs listed on the TCDS.) Two special conditions, one exemption, and some additional ELOS were granted.

For the 680A the certification basis was further updated to Amendment 25-134 for those significantly changed areas. One special condition, one more exemption, and some additional ELOS were granted.

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

(ii) Special Conditions:

Model 680:

No. 25-214-SC High Intensity Radiated Fields (HIRF) – Each electrical and electronic system that performs critical functions, whose failure would contribute to or cause a failure condition that would prevent continued safe flight and landing of the airplane, must be designed and installed to ensure that the operation and operational capability of these systems to perform critical functions are not adversely affected when the airplane is exposed to high intensity radiated fields.

Models 680, 680+, 680A:

No. 25-248-SC Side-facing Single-occupant Seats – Specifies injury protection criteria in addition to §25.562(c)(1) through (c)(6) to the occupants of single-occupancy side-facing seats (does not apply to multiple occupancy seats such as divans or sofas). These include thoracic trauma, pelvic acceleration, body-furnishing contact and shoulder strap loads.

Models 680+, 680A:

No. 25-507-SC Aircraft Electronic System Security Protection from Unauthorized Internal Access – The intent is to ensure that security, integrity, and availability of aircraft systems are not compromised by certain wired or wireless electronic connections between airplane data busses and networks. The design must provide isolation from, or security protection against, access by unauthorized sources internal to the airplane, and prevent inadvertent and malicious changes to, and all adverse impacts upon, airplane equipment, systems, networks, or other assets required for safe flight and operations. There must also be procedures for continued airworthiness.

No. 25-508-SC Aircraft Electronic System Security Protection from Unauthorized External Access – The applicant must ensure airplane electronic system security protection from access by unauthorized external sources, including maintenance activity. Threats must be identified and assessed, and effective security protection strategies must be implemented to protect from all adverse impacts on safety, functionality, and continued airworthiness, including modifications.

Model 680A:

No. 25-579-SC Pilot Compartment View – Use of Hydrophobic Coatings in Lieu of Windshield Wipers – The ability to maintain a clear area of forward vision at high speeds and in rain has been based on the use of wipers or vented air. For hydrophobic coatings there must be a means to maintain a clear portion of the windshield, during precipitation conditions, enough for a sufficiently extensive view along the ground or flight path in normal taxi and flight attitudes. This must be designed to function, without continuous crew attention, from light misting precipitation to heavy rain, at speeds from fully stopped in still air, to 1.5 V_{SR1} with lift and drag devices retracted.

(iii) Exemptions

Models 680, 680+ and 680A:

No. 7625A – General occupant protection requirements of §25.785(b) – This was granted for persons occupying multiple-place side-facing seats during takeoff and landing, on the grounds the existing regulations do not provide adequate or appropriate safety standards. Limitations were specified, including current §23.562(c) criteria, requirements for body-to-body contact; TTI (Thoracic Trauma Index); lateral pelvic acceleration; body-to-wall/furnishing contact; and occupant retention. Originally restricted to aircraft manufactured before 1/1/2004, this removes that limit on the grounds that acceptable methods of compliance have still not yet been developed.

Model 680:

No. 8280 – Lateral trim requirements of §25.161(d) – §25.161(d) requires lateral trim to be maintained at 1.3 V_{SR1} during OEI climb. The 680 has a constant OEI climb speed for all weights to optimise climb performance (Originally proposed to be reduced to 160 KIAS, but subsequently kept at 180 KIAS.). Under these conditions a rolling moment cannot be completely trimmed out and there is a residual control force required to maintain the climb path. The FAA considers it is in the public interest to accept this and the existing trim system, due to the high cost and time delay required for re-design, and the safety benefit of a simplified operating procedure.

No. 10089 – Oxygen dispensing unit requirements of §25.1447(c)(1) – This requires the automatic presentation of oxygen masks to occupants before the cabin pressure altitude exceeds 15,000 feet. Instead, this exemption will permit oxygen masks to be automatically presented at cabin pressure altitudes of 15,750 ±250 ft when operating into and out of airports at altitudes above 14,000 ft. This feature is necessary to reduce the occurrence of inadvertent deployment of oxygen masks. (In the 680 the flightcrew must select the "> 14K" position on the airport elevation selection switch.)

Model 680+:

No. 10902 – §25.901(c) Uncontrollable high thrust (UHT) – This time-limited exemption was granted against the requirement that no single failure will jeopardise safe operation of the aircraft, on the basis that Cessna had taken all practical steps to minimise adverse effects on safety, and by demonstrating by analysis of the UHT rate that the overall level of safety of the engine control system is no less than the current transport category aircraft fleet. The four year period will give time to develop thrust-malfunction accommodation logic in the engine software.

Model 680A:

No. 11350 – §25.809(a) for view out of emergency door exits – Amendment 25-116 requires that “means must also be provided to permit viewing of the likely areas of evacuee ground contact”, which is often impractical to achieve with overwing exits and was not the exact intent of the Rule. This partial exemption allows viewing the first point of contact with the ground after the exit has been opened and the evacuee is on the upper surface of the wing.

(iv) Equivalent Level of Safety Findings:
Models 680, 680+ and 680A:

TC2548WI-T-AG-2 – Door Between Passenger Compartments – The 680 has an aft lavatory/vanity area separated from the main passenger cabin by pocket doors, which slide out of privacy partitions and are held together by a magnetic strip. The configuration includes placing a belted side-facing seat in that area able to be used during taxi, takeoff and landing. This creates two passenger compartments separated by a door within the cabin, which is in conflict with §25.813(e). Cessna showed the doors will be open in an emergency by the use of flight manual instructions and limitations, placards, procedures, and design features including an unlatched door warning system.

TC2548WI-T-AG-4 – Exit Locator and Exit Marking Signs – The Model 680 is certificated for 12 passengers and 2 crew. The emergency exit signs comply with §25.812 with the exception of the background areas, and also serve as both an exit marking sign and the exit locator sign required by §25.811(d)(1). Compensating factors include; The 680 cabin is small in size with respect to the cabins contemplated in the intent of §25.812(b)(1). In addition, it has a single row of seats on each side of the aisle and a cabin width equal to the Models 650 and 750 (5.5 feet). This cabin size creates a condition in which all exit locator and marking signs become easily legible (seen and read); Similar and/or identical exit signs were previously granted an Equivalent Level of Safety for similar aircraft. The Model 680 has less than or equal cabin lengths of other approved aircraft with similar configurations and therefore the exit signs are considered a more appropriate design.

TC2548WI-T-AG-6 – Gust and Continuous Turbulence Loads – Cessna proposed replacing the existing continuous design criteria of §25.341(b), which does not accurately account for the distribution of turbulence in the atmosphere, with the criteria contained in the proposed NPRM dated June 24, 1999, titled "Revised Requirements for Gust and Continuous Turbulence Design Loads." The proposed NPRM is the result of ARAC harmonization of the JAR and FAR requirements and is consistent with maintaining and enhancing the level of safety.

TC2548WI-T-P-5 – Use of Single Fire Suppression Bottle for Protection of APU and Baggage Compartment – With a single fire extinguishing bottle for both the baggage compartment (Class C) and the APU (non-essential, flight operational) the concerns of common failure or inappropriate crew actions were addressed by: Independent detection, control and wiring systems; no common cause failures which would allow a fire in one to progress to the other area and the probability of fire in both is extremely improbable; dual discharge ports; and if one system discharges the other system is rendered inoperative and the AFM specifies that it shall not be used.

TC2548WI-T-P-6 – Certification of Thrust Reversers – The 680 thrust reverser features to prevent unintended in-flight deployment are; Multiple layers of defence in the command system; and aerodynamic loading on the T/R to prevent deployment due to "overstowing" of the latches within a range of flight conditions. The ELOS covers operation outside the overstow envelope and showed that; 1. The T/Rs have been demonstrated to not deploy with pilot commands or system failures due to aerodynamic loads when the aircraft is operated outside the overstow envelope; and 2. The components and structure, whose failure could result in T/R deployment, have been shown to be reliable by tests and analysis establishing structural integrity and effective redundancy.

TC2548WI-T-SE-5 – Electric Standby Direction Indicator (Compass) – The 680 does not have a typical non-stabilised magnetic compass, the only standby compass being provided by the standby suite of electric instruments. These are a Secondary Flight Display (SFD), displaying a third source for attitude, airspeed, and altitude information; and a Horizontal Situation Indicator which displays a third heading, utilizing a remotely mounted magnetic flux detector with gyroscopic stabilization provided by the SFD attitude source. An ELOS against the literal requirements of §25.1303(a)(3) was granted on the grounds that loss of heading display is extremely remote, the standby instruments have a separate back-up battery and have been tested for HIRF and lightning.

TC2548WI-T-SG-1 – Cabin Pressurization – High Altitude Takeoff and Landing Operation – The 680 is certified for operations from airports up to 14,000 feet elevation. The rule requires a warning when cabin altitude exceeds 10,000 feet. To avoid nuisance indications the system shifts to alternative warning circuits under specific conditions for high altitude operations. There is a warning system which switches the system to manual in the event of failure of the alternative circuits, and specific flight manual procedures for the crew. The system minimizes cabin exposure to altitudes above 8,000 ft and never lets it get above 15,000 ft.

Models 680 and 680+:

TC2548WI-T-AG-1 – Ditching Emergency Exits for Passengers. – Ditching exits must be provided in accordance with §25.807(i), whether or not certification with ditching provisions is requested. Cessna has not requested approval for ditching for the Model 680. The RH emergency exit is an over wing exit in full compliance with §25.807(i). However, the LH emergency exit, the cabin entry door, is a Type I side exit where expected flotation in fresh water would have the lower sill below the waterline. As in previous type certificates (A9NM, T00007WI and A23CE), a water barrier is provided for insertion prior to a ditching such that a freeboard is achieved from the projected flotation waterline. This will leave an opening above the waterline that complies with the minimum size of a Type III exit. Cessna has successfully demonstrated by evacuation tests that in the Model 680 with 13 passengers and 2 crew, evacuation can be accomplished by installing the water barrier within the airplane's analytically determined flotation time following a water landing.

TC2548WI-T-AG-3 – Width of Aisle – The Model 680, certificated for 12 passengers, has an aisle width between seats which meets the requirements of §25.815 for a seating of capacity of 10 passengers, but not for 11 or more. An ELOS was previously issued for the Model 560XL which has the same aisle dimensions and a passenger seating capacity of 11 passengers. Other Citation models have also had similar ELOS issued. Cessna has demonstrated by evacuation tests that the escape hatch egress is the main restriction and not aisle width. As the 680 has greater headroom than the aircraft cabins used for those trials, the ELOS principle established is applicable to the 680.

TC2548WI-T-AG-5 – Placards for Main Entry Door – The 680 Main Cabin Door is a Type I exit and complies with §25.783(h), which references §25.807 through §25.813, except it does not comply with §25.811(e)(4). The handle has a rotational motion that is perpendicular to the plane of the door and is mounted on a shaft on the forward edge of the door's integral steps. The door handle is closed when the handle is in its up position. The vertical arrow and associated placards for the door handle are easily understood and located and provide an equivalent level of safety.

Model 680:

TC2548WI-T-F-1 – Use of 1-G Stall Speeds for Determining Compliance – An ELOS finding for the use of 1-g stall speeds, instead of the minimum speeds obtained in the stalling maneuver, for showing compliance with certain FAR 25 performance was established for several past TC projects. Pilot objectivity on stall identification has become a key factor in decisions on flying technique. To become consistent with recent practice, the application of 1-g stall speed criteria is being expanded to include most areas of the transport-related regulations that use stall speed (V_S) as a factor. The 1-g stall requirements were derived to provide a more realistic and consistent basis for the definition of V_S as the minimum speed at which wing lift alone can support the airplane in level flight. Service history has not indicated a safety-related deficiency in existing operating speeds that typically have their minimum allowable values defined as a multiple of the $V_{S\ MIN}$. The alternative standards above were subsequently adopted in Part 25 at Amendment 25-108.

TC2548WI-T-P-1 – Digital APU Indicators (Oil Temp., Gas Temp., Tachometer) – The 680 flight operational APU incorporates an ECU that provides complete monitoring and control with digital-only displays of rotor speed and exhaust gas temperature. There are no cockpit displays of oil pressure or temperature. The intent of §25.1305 and §25.1549 to permit crew monitoring and corrective action is inherently met by design with reliability at least as high as would be the case with analog cockpit indications and the associated colored range markings. In any event where the crew could observe an exceedance, or be provided with a low oil pressure warning, the APU would be shut down, and the crew alerted to the event. Since the APU is classified as non-essential equipment, no hazard is introduced by an automatic protective shutdown.

TC2548WI-T-P-2 – Digital Engine Parameters, Fuel Flow – The Model 680 uses electronic displays for the powerplant instruments required by §25.1305 (c)(2) and (c)(3). Both high pressure compressor rotor speed (N_2) and engine fuel flow (W_f), and the standby engine instrument presentation of N_1, N_2, and ITT, are digital numeric presentations. The FADEC system operates with independent overspeed protection, decreasing fuel flow with increasing N_1 or N_2 speed. This will prevent critical engine overspeed and is considered a compensating feature. The location of the engine standby gauge was shown by flight test demonstration to meet the requirements for trend and rate information, and visibility, including appropriate conditions of lighting and panel vibration.

Cessna-066650-SG-5 – Operation at High Altitude Airports between 14,000 ft and 15,000 ft MSL – This was an extension of TC2548WI-T-SG-1 to permit operations at airports with an elevation of up to 15,000 feet.

Models 680+ and 680A:

AT5438WI-T-P-5 – FAR §25.901(c), §25.903(d)(2), §25.1305, §25.1309(a)(b)(c), §25.1321(c)(2), §25.1322 and §25.1549 – Digital-Only Display of Turbine Engine High Pressure Rotor Speed (N2), Oil Pressure, Oil Temperature and Fuel Flow – This was an extension of TC2548WI-T-P-2 for the later Sovereign models.

AT5438WI-T-P-1 – §25.1305(a)(4)(5)(6) and §25.1549(a)(b)(c) – Digital display of APU Instruments – This was an extension of TC2548WI-T-P-1 for later models.

Cessna-072100-P-4 – §25.1141(f)(2) – Powerplant Valve Indication – Power assisted valve controls must have a means to indicate when a valve is open or closed, or moving between. This is to limit potential for crew to select an inappropriate position or be unaware of the valve position. This ELOS was granted because the FADEC monitors valve status with the HMU, along with crew procedures, and the aircraft can be operated safely without an indication of valve position.

Model 680A:

Cessna-072100-AG-1 – §25.807(i) Emergency Exit – Use of Water Barrier – Similar to previous Models on the 680A the secondary escape route is the main cabin entry door, which may be used for evacuation by deploying the water barrier prior to ditching, and subsequent opening of the main door. No special training or experience is required to deploy the water barrier and the simplicity of the design would allow even naïve occupants to complete deployment with ease and rapidity. Complete deployment instructions will be placarded adjacent to the water barrier.

Cessna-072100-S-3 – §25.831(g) – Acceptable High Temperature Physiological Environment During Failure Conditions – The 680A ventilation system does not comply with the exact time temperature-humidity requirements of §25.831(g) following all improbable failure conditions at low altitudes, where ambient air may be warm and moist. This allows for use of an ARAC Recommended Revision, which is a new performance-based standard which preserves a tolerable environment by limiting the metabolic and environmental heat loads to occupants.

Cessna-072100-S-5 – §25.783(d)(2) Cabin Entry Door – Independence of Latch Securing Means and Locking System – The Model 680A cabin entry door latches are secured by a means that is not completely independent of the locking system. The compensating factors raise the level of safety by incorporating redundant (more latches than needed), robust and independent design features that prevent the cabin entry door from opening in flight.

Cessna-072100-S-6 – §25.783(d)(2) Unpressurized Doors – Independence of Latch Securing Means and Locking Systems – The Model 680A left hand nose access door, right hand nose access door and aft baggage door are unpressurized doors secured by a means that is not completely independent of the locking system. Similar compensating factors of robustness, redundancy and independence were provided as for the main cabin entry door.

(v) Airworthiness Limitations:
See Maintenance Manual Chapter 4 – Airworthiness Limitations

(vi) Additional Design Requirements and Conditions:
The TCDS lists the following Additional Design Requirements:

Models 680+ and 680A:
In-flight Engine Restart – A minimum restart capability after an all-engines-out scenario was required to be established for three specific conditions (takeoff and initial climb-out; high altitude cruise; and low-speed holding) using procedures provided in the AFM.

Model 680+:
Flight in Icing Conditions – While showing compliance with FAR 25 at amendment 25-129, compliance was accepted using ice accretions based on the atmospheric icing conditions defined in Appendix C at amendment 25-0.

Airplane Flight Manual – The AFM text associated with the design maneuvering speed (V_A) meets the requirements of FAR §25.1583, at amendment 25-130.

(3) Aircraft Noise and Engine Emission Standards:

(i) Environmental Standard:
The 680 Series has been certificated under FAR Part 34, including Amendments 34-1 through 34-3 (680) and 34-4 (680+ and 680A), and FAR Part 36, including Amendments 36-1 through 36-28.

(ii) Compliance Listing:
Cessna Report No. D-680-231 Rev B – Model 680 FAR 36 Noise Test Results
Cessna Report No: D-680-231/V2 Rev B – Model 680 – Noise Test Results
Cessna Report No: D-680A-231 – Model 680A – Noise Test Results

MODEL:	MCTOW:	ENGINE:	Certificated Noise Levels		
			Flyover	Lateral	Approach
680	30,300 lb.	PW306C	71.8 EPNdB	87.5 EPNdB	91.3 EPNdB
680+	30,775 lb.	PW306D	71.9 EPNdB	87.8 EPNdB	87.9 EPNdB
680A	30,800 lb.	PW306D1	73.5 EPNdB	87.7 EPNdB	87.7 EPNdB

Stage 3 Margin Model 680 – 29.2 EPNdB. Stage 4 compliant as the cumulative margin to Stage 3/Chapter 3 is not less than 10 dB, and the sum of the Stage 3/Chapter 3 margins at any two measurement points is not less than 2 dB.

(4) Certification Compliance Listing:

Cessna Report 680-00-002 Rev A dated 24-11-2004 – Model 680 Master Compliance Checklist

Report C680-106 – Crashworthiness Evaluation – Interiors
Report EV-680-102 – Oxygen System Compliance Report

Cessna Document No: PR-680-001/V1 – Model 680 Block Point Change – Project Specific Certification Plan – Volume 1 Revision D
Doc. No: PR-680-001/V2 – Volume 2 – Proposed Means of Compliance Table

Report S-680-601/V2 – Model 680 – Crashworthiness Evaluation (Units 501 & on)
Report S-680-1000/V2 – Model 680 Structural Integrity Plan (Units 501 & on)
Report No: C-680-105 – Cabin Egress Evaluation, Interiors – Revision D

Cessna Document No. PR-680A-001 V1 – Model 680A – Project Specific Certification Plan – Volume 1 Revision C
Doc. No: PR-680A-001/V2 – Volume 2 – Proposed Means of Compliance Table

Report No: EV-680A-101 – Model 680A – Title: Oxygen System Compliance

(5) Flight Manual: FAA-Approved Airplane Flight Manual Citation Sovereign Publication 68FM – CAA Accepted as AIR 3108

FAA-Approved AFM – Citation Sovereign+ – Model 680 (680-0501 and on) – Publication 68FMA – CAA Accepted as AIR 3337

FAA-Approved Airplane Flight Manual Citation Latitude Publication 68AFM – CAA Accepted as AIR 3338

(6) Operating Data for Aircraft and Engine:

(iii) Maintenance Manual:
Publication 68MM – Model 680 Maintenance Manual
Publication 68WD – Model 680 Wiring Diagram Manual
Publication 68SR – Model 680 Structural Repair Manual
Publication 68ND – Model 680 Nondestructive Testing Manual
Publication 68WB – Model 680 Weight and Balance Manual
Publication 68TE – Model 680 Illustrated Tool and Equipment Manual
Publication 68CM – Model 680 Component Maintenance Manual

Publication 68AMM – Model 680A Maintenance Manual
Publication 68AWD – Model 680A Wiring Diagram Manual
Publication 68ASR – Model 680A Structural Repair Manual
Publication 68AND – Model 680A Nondestructive Testing Manual
Publication 68ACM – Model 680A Component Maintenance Manual

(iv) Current service Information:
Model 680 Service Bulletins and Service Letters

(v) Illustrated Parts Catalogue:
Publication 68PC – Model 680 Illustrated Parts Catalog

Publication 68APC – Model 680A Illustrated Parts Catalog

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

All publications are now provided directly to the CAA through the Cessna website: http://techpubs.cessna.com/

(8) Other information:

Citation Sovereign Operating Manual – Publication 68OM

Report AV-680-202 – Model 680 Avionics Equipment List, Rev B dated 25-7-04.
Model 680 – MMEL Operating & Maintenance Procedures Guide

Cessna Sovereign + – Specification and Description – Units 680-0540 to TBD – October 2013 – Revision C

Report Number: AES-680-162 – Model 680 (BPC) – Electrical Load Analysis

Engineering Report Number: AES-680-162 – Model: 680 – Electrical Load Analysis Report – Rev.A 7 February 2014

Engineering Report Number: AES-680A-106 – Model: 680A – Load Analysis Certification Compliance Report – Original Issue February 10, 2015

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	***To be determined on an individual aircraft basis***
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

Appendix C – Air Transport Aeroplanes – More than 9 Pax

PARA:	REQUIREMENT:		MEANS OF COMPLIANCE:
C.1	Doors and Exits	(1) Main, over-wing and baggage compartment exit internal and external operation; (2) FAR §25.813; (3) FAR §25.783	
C.2.1	Additional Emergency Exits – FAR 23.807(b) @ 10.5.93	(a) FAR §25 requirements exceed FAR 23 requirements (b)(1) Main door is FAR 25 Type I ; Overwing RHS Type III emergency exit – both meet FAR §23.807(b). (b)(2), (3) Not Applicable – maximum 12 passengers	
C.2.2	Emergency Exit Evacuation Equipment – Descent means		Main exit <2m from ground, One over-wing exit
C.2.3	Emergency Exit Interior Marking – Size/self-illuminating		FAR §25.811 and ELOS Issue Paper AG-4.
C.3.1	Landing Gear Aural Warning – Automatic Flap Linking		(a) FAR §25.729(e) ; (b) FAR §25.729(e); (c) N/A

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	Seating and Restraints – Safety belt/Shoulder Harness		FAR §25.785	
91.507	Pax Information Signs – Smoking, safety belts fastened		FAR §25.791 – Fitted as standard. (See Report C680-106)	
91.509	Minimum Instruments and Equipment			
	(1) ASI	FAR §25.1303(b)(1)	(8) Coolant Temp	Not Applicable – Turbojet
	(2) Machmeter	FAR §25.1303(c)(2)	(9) Oil Temperature	FAR §25.1305(a)(6)
	(3) Altimeter	FAR §25.1303(b)(2)	(10) Manifold Pressure	Not Applicable – Turbojet
	(4) Magnetic Compass	FAR §25.1303(a)(3))	(11) Cylinder Head Temp.	Not Applicable – Turbojet
	(5) Fuel Contents	FAR §25.1305(a)(2)	(12) Flap Position	FAR §25.699
	(6) Engine RPM	FAR §25.1305(c)(3)	(13) U/C Position	FAR §25.729(e)
	(7) Oil Pressure	FAR §25.1305(a)(4)	(14) Ammeter/Voltmeter	FAR §25.1351 (b)(6)
91.511	Night VFR Instruments and Equipment		* Fitted as Standard	
91.513	VFR Communication Equipment		* Fitted as Standard	
91.517	IFR Instruments and Equipment		* Fitted as Standard – NOTE: For oceanic/remote operations Single or Dual HF-1050 installations are available as options	
91.519	IFR Communication and Navigation Equipment		* Fitted as Standard	
	Note: The Model 680 is type certificated for Day and Night VFR and IFR, and Flight Into Known Icing Conditions. **Model 680** fitted with Honeywell Primus EPIC – Standard equipment includes: Four DU-1080 displays, Four Modular Avionics Unit (MAU) and dual Modular Radio Cabinet (MRC) architecture supporting dual autopilot, dual FMS, dual ADC, TAWS, dual VHF Comm, dual Nav, dual transponder, dual DME, ADF (single or dual option); Dual Collins AHS-3000 AHRS, TCAS (L-3 TCAS 2000 or Honeywell CAS-67), Honeywell VHF Digital Radio (Datalink/CMF) **Models 680+ and 680A** fitted with Garmin 5000 EFIS – Standard equipment includes: Two GIA 63W integrated avionics units (comm, nav); Two GDC 7400 air data computers; Dual LITEF LCR 100N AHRS; GTS 8000 TCAS II; Dual Collins DME; Collins ADF (optional); GDL 69A XM; GSR 56 Iridium; GDR 66 VHF			
	RVSM – Model 680 is certificated and equipped for RVSM Operations (See TCDS Note 9) ***680A is not yet group approved.***			
	NAVIGATION SPECIFICATIONS: **Model 680** is capable of Oceanic/Remote *, NAT MNPS*, RNP10*, RNAV5/BRNAV, RNP-4**, RNAV1 SIDs and STARs, PRNAV/RNP-1, non-precision approach and VNAV (See AFM Supplement 25 – EPIC FMS) * **Models 680+ and 680A** are capable of Oceanic/Remote*, NAT MNPS*, RNP10*, RNAV5/BRNAV, RNP-4**, RNAV1 SIDs and STARs, RNP-2, PRNAV/RNP-1, RNP-APCH (min RNP 0.3), non-precision approach and baro-VNAV (See AFM Section 2, FMS Navigation Operation Capabilities) * Operations require additional comms HF radio (Part 91) or dual HF (Part 125) ** Requires beyond-line-of-sight CPDLC			

91.523	Emergency Equipment (a) More than 9 pax – First Aid Kits/Fire Extinguishers (b) More than 20 pax – Axe readily accessible to crew (c) More than 61 pax – Portable Megaphones per Table 9	 Fire Extinguisher and First Aid Kit fitted as standard Not Applicable – Less than 20 passenger seats Not Applicable – Less than 61 passenger seats
91.529	ELT – TSO C91a after 1/4/97 – C126 after 22/11/07	Kannad 406 AF, TSO C126 Fitted as Standard (680)
91.531	Oxygen Indicators – Volume/Pressure/Delivery	Model 680 meets FAR §25.1443 through §25.1453
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) Minimum Quantity Supplemental 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 - Automatically Presented Above FL140 - Manual Means of Deploying Pax Masks	Max. Operating Altitude: 47,000 ft (680/+) 45,000 ft (680A) TSO C89/99 Eros MC10-16-100 Quick-donning pressure demand masks are provided at each pilot seat. Automatic dropout constant-flow TSO C64a masks are provided in the cabin: Six double units in the cabin and one double unit in the toilet. (16.6% more than pax, meets the requirement for sufficient spare masks and distribution) One 77 ft^3 oxygen bottle in belly fairing, contents displayed on cockpit gauge. Usable volume 67 ft^3 (1903 litres.) Oxygen Quantities: (See calculations in §4.2.1.1 of EV-680-112) Single bottle meets CAR §91.535(a)(5)(i) thru (iv) depending on duration of flight. Passenger oxygen masks are only made available automatically at 14,500 ± 500 feet. Manually deployable. Exemption 10/EXE/22 granted 18 Nov 2009.
	NOTE: Originally a Special Condition of Import was specified that installation of the optional cabin 5 ft^3 portable oxygen bottle was required to meet CAR §91.535(a)(5)(iv), based on advice from the manufacturer. Subsequent review has now determined that no separate portable oxygen supply is needed when no flight attendant is required, and the required supply of therapeutic oxygen can be provided from the main passenger cabin oxygen system supply, and individual masks.	
91.541	SSR Transponder and Altitude Reporting Equipment	Dual Honeywell XS-855 Mode S fitted as standard (680) Dual GTX 3000 Transponders fitted as std (680+/680A)
91.543	Altitude Alerting Device - Turbojet or Turbofan	Fitted as Standard
91.545	Assigned Altitude Indicator	N/A – Altitude alerting device fitted
A.15	ELT Installation Requirements	Kannad 406 AF, TSO C126 Fitted as Standard. Factory installation meets A.15 stiffness requirements.

Civil Aviation Rules Part 125

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:		MEANS OF COMPLIANCE:
125.355	Seating and Restraints		FAR Part 25 §25.7859(g)
125.357	Additional Instruments (Powerplant and Propeller)		FAR Part 25 §25.1305
125.359	Night Flight	Landing light, Pax compartment	Fitted as Standard – See Specification and Description
125.361	IFR Operations	Speed, Alt, spare bulbs/fuses	Fitted as Standard – See Specification and Description
125.363	Emergency Equipment (Part 91.523 (a) and (b))		Fitted as Standard – See Specification and Description
125.364	Protective Breathing Equipment		Not applicable – less than 20 passenger seats.
125.365	Public Address and Crew Member Intercom System		Standard part of audio/interphone system.
125.367	Cockpit Voice Recorder – Appendix B.3 (TSO C84/C123)		Honeywell FA-2100 fitted as standard – TSO C123a
125.369	Flight Data Recorder – Appendix B.4 requires TSO C124		***Operating Rule – Compliance to be determined by Operator*** Only required if configured with 10 or more passenger seats. Honeywell FA-2100 optional fit – TSO C124b.
125.371	Additional Attitude Indicator		Goodrich GH-3000 standby flight display fitted as standard.
125.373	Weather Radar – Appendix B.6 requires TSO C63		Honeywell Primus 880 fitted as standard – TSO C63c (680) Garmin GWX-70 fitted as standard on G5000 – TSO C63d
125.375	Ground Proximity Warning System - Appdx B.7 TSO C92		N/A – Superseded by 125.379
125.377	AEDRS		Not Applicable – Not a single-engined aeroplane
125.379	Terrain Awareness and Warning System (TAWS) Appendix B.9 requires TSO C151a or b		Honeywell EGPWS Mk V with windshear fitted as standard. Meets TSO C151b Class A. (Model 680) Garmin Class A TAWS fitted as standard on G5000
125.381	Airborne Collision Avoidance System (ACAS II) Appendix B.10 requires TSO C119b or C119c		***Operating Rule – Compliance to be determined by Operator*** ACAS (TCAS II version 6.0) to TSO C119a std on EPIC GTS 8000 ACAS II (TCAS II Version 7.1) std on G5000

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was exactly 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 Cessna 680 s/n 680-058 ZK-JTH
Three View Drawing of Cessna Model 680 Sovereign
Three View Drawing of Cessna Model 680A Latitude
Copy of FAA Type Certificate Data Sheet Number T00012WI

Sign off

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David Gill	Checked – Wayne Thomas
Team Leader Airworthiness	Team Leader Avionics

Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
680 Sovereign	Pacific Jets Ltd	9/21B/16	24 November 2009
680+, 680A	Cessna Aircraft Company	16/21B/24	14 December 2015