

---

# **Type Acceptance Report**

**TAR 11/21B/21**

**ROBINSON R66**



## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>1</b>
<b>1. INTRODUCTION</b>	<b>1</b>
<b>2. ICAO TYPE CERTIFICATE DETAILS</b>	<b>1</b>
<b>3. TYPE ACCEPTANCE DETAILS</b>	<b>2</b>
<b>4. NZCAR §21.43 DATA REQUIREMENTS</b>	<b>3</b>
<b>5. ADDITIONAL NEW ZEALAND REQUIREMENTS</b>	<b>5</b>
<b>ATTACHMENTS</b>	<b>6</b>
<b>APPENDIX 1</b>	<b>6</b>



## Executive Summary

New Zealand Type Acceptance has been granted to the Robinson R66 based on validation of FAA Type Certificate number R00015LA. 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).

## 1. Introduction

This report details the basis on which Type Acceptance Certificate No. 11/21B/21 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. ICAO Type Certificate Details

Manufacturer: Robinson Helicopter Company

Type Certificate: R00015LA  
Issued by: Federal Aviation Administration

Model: R66

MCTOW 2700 lb.

Max. No. of Seats: 5

Noise Standard: FAR Part 36 (ICAO Annex 16 pending)

**Engine:** Rolls Royce 250-C300/A1  
Type Certificate: E4CE  
Issued by: Federal Aviation Administration

(Type accepted under TAC 11/21B/22)

### 3. Type Acceptance Details

The application for New Zealand type acceptance was from the manufacturer, Robinson Helicopter Company dated 11<sup>th</sup> April 2011. The first-of-type example was serial no. 015, registered ZK-HAG. The R66 is a five-place single turbine-powered helicopter of all-metal construction with a two-blade teetering main rotor and conventional two-blade tailrotor.

Type Acceptance Certificate No. 11/21B/21 was granted on 13 April 2011 to the Robinson Model R66 based on validation of FAA Type Certificate R00015LA. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

Although an all-new model the R66 was based on the previous R44 and retains the same basic cabin, drive train and rotor system layouts. A Rolls Royce 250 Series turbine engine is angle-mounted well aft in the fuselage for c.g. reasons, which allows for provision of a large baggage compartment. The cabin has been widened approximately eight inches to permit fitting of a third rear seat. The main rotor is the same diameter as the R44 but has increased chord to provide extra lift for the higher gross weight, and the rotor height has been increased by around eight inches to permit additional centre of gravity travel. A larger tailrotor has been fitted. The seats meet the emergency landing dynamic test requirements of FAR §27.562, while the fuel tank is fitted with a TSO C80 rubber bladder and complies with the crashworthiness provisions of FAR §27.952(a). Following initial type acceptance to facilitate certification of the first R66 demonstrator on the New Zealand Civil Aircraft Register a team of certification specialists from the CAA Aircraft Certification Unit visited the Robinson Helicopter Corporation in Torrance for a validation/familiarisation review to complete the exercise. (See Minutes of Meeting dated 29 April 2011.)

#### 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:

FAA Type Certificate Number R00015LA

FAA Type Certificate Data Sheet number R00015LA dated October 25, 2010  
– Model R66 approved 25 October 2010

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the R66 is FAR Part 27 dated February 1, 1965, as revised by Amendments 27-1 through 27-44. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, because FAR 27 is the basic standard for Normal Category Rotorcraft 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:*

Nil

(iii) *Equivalent Level of Safety Findings:*

Nil

(iv) *Exemptions:*

Exemption No. 9589 (Regulatory Docket FAA-2006-25287) was granted to RHC against the FAR §27.695 requirement to consider the jamming of a control valve in the powered flight control system as a possible single failure. The justification was that the R66 is based on the low-cost and mechanically simple R44 system, for which the same exemption was granted. This had proven reliability over a fleet size (2006) of 2600 examples and over two million flight hours with no reported control valve problems. (Current service experience is 4400 aircraft and 5 million hours.)

(v) *Airworthiness Limitations:*

See Maintenance Manual Section 5

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The Model R66 has been certificated under FAR Part 36, including Amendments 36-1 through 36-28.

(ii) *Compliance Listing:*

Appendix J Noise Level (clean with standard doors) 82.4 dB(A) SEL (See RFM §5)

(4) Certification Compliance Listing:

RTR 633 – Compliance Checklist – R66 Helicopter – Rev.E 22-10-10

R66 Robinson Technical Reports (list)

FAA Issue Paper G-1 – Type Certification Basis  
FAA Issue Paper F-1 – Muting of Low Rotor Speed Aural Warning  
FAA Issue Paper G-5 – Power Boost and Power-Operated Control Systems  
FAA Issue Paper P-1 – Certification of Engine Inlet Barrier Filter

- (5) Flight Manual: R66 Pilot's Operating Handbook and FAA-Approved Rotorcraft Flight Manual – Document RTR 661 – CAA Accepted as AIR 3177
- (6) Operating Data for Aircraft and Engine:
- (i) *Maintenance Manual:*  
R66 Maintenance Manual and Instructions for Continued Airworthiness RTR 660
  - (ii) *Current service Information:*  
Service Bulletins and Service Letters
  - (iii) *Illustrated Parts Catalogue:*  
Robinson Model R66 Illustrated Parts Catalog
- (7) Agreement from manufacturer to supply updates of data in (5), and (6):  
See letter from RHC Certification Manager dated April 8, 2011
- (8) Other information:  
RTR 623 – Electrical Load Analysis – R66 Helicopter – Rev.F 27-12-10



## 5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 has been assessed as they are a prerequisite for the grant of an airworthiness 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	<i>To be determined on an individual aircraft basis</i>
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

##### Appendix E – Helicopters

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
E.1	Doors and Exits	FAR §27.783 and FAR §27.807(b)(2) – (1) and (2) Complies by inspection. (iii) Double action required to actuate door mechanism. Locked position clearly visible to pilot.
E.2.1	Emergency Exit Marking	FAR §27.807(b)(3) and FAR §27.1557(d)

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 §27.785
91.507	Pax Information Signs – Smoking, safety belts fastened	Not Applicable – Less than 10 passenger seats
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	FAR § 27.1303(a) Not Applicable FAR § 27.1303(b) FAR § 27.1303(c) FAR § 27.1305(d) FAR § 27.1305(k) FAR § 27.1305(h)
91.511 Night	(1) Turn and Slip (2) Position Lights	<i>Operational Requirement</i> Fitted as Standard – See POH
91.513	VFR Communication Equipment	<i>Operational Requirement – Compliance as applicable</i> King KY196A Fitted as Standard
91.517	IFR Instruments and Equipment	Not Applicable – R66 approved for VFR operations only
91.519	IFR Communication and Navigation Equipment	Not Applicable – R66 approved for VFR operations only
91.523	Emergency Equipment (a) More Than 9 pax - First Aid Kits per Table 7 - Fire Extinguishers per Table 8 (b) More than 20 pax - Axe readily accessible to crew (c) More than 61 pax - Portable Megaphones per Table 9	Not Applicable – Less than 10 passengers Not Applicable – Less than 10 passengers Not Applicable – Less than 20 passengers Not Applicable – Less than 61 passengers
91.529	ELT – TSO C126 406 MHz after 22/11/2007	Kannad 406 AF-Compact Fitted as Standard
91.531	Oxygen Indicators - Volume/Pressure/Delivery	<i>Operational Requirement – Compliance as applicable</i>
91.533	Oxygen Equipment for Non-pressurised Aircraft >30 min above FL100 - Supplemental for crew, 10% Pax - Therapeutic for 3% of Pax Above FL100 - Supplemental for all Crew, Pax	Not fitted as standard. Maximum operating density altitude in RFM 14,000 feet. (Maximum operating altitude 9000 feet AGL to allow landing within 5 minutes in case of fire.)
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operational Requirement – Compliance as applicable</i> Garmin GTX 327 Fitted as Standard
91.543	Altitude Alerting Device – Turbojet or Turbofan	Not Applicable – R66 approved for VFR operations only
91.545	Assigned Altitude Indicator	Not Applicable – R66 approved for VFR operations only
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

## Civil Aviation Rules Part 135

### Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
135.355	Seating and Restraints – Shoulder harness flight-crew seats	FAR §27.785
135.357	Additional Instruments (Powerplant and Propeller)	FAR §27.1305
135.359	Night Flight	Landing light, Pax compartment
135.361	IFR Operations	Speed, Alt, spare bulbs/fuses
135.363	Emergency Equipment (Part 91.523 (a) and (b))	Fitted as standard – See POH Section 7
135.367	Cockpit Voice Recorder	Not Applicable – R66 approved for VFR operations only
135.369	Flight Data Recorder	<b>Operational Requirement – Compliance as applicable</b>
135.371	Additional Attitude Indicator	N/A – Only for 2-crew helicopters with more than 10 pax
		Not Applicable – Less than 10 passenger seats
		Not Applicable – Not turbo jet or turboprop powered

## Attachments

The following documents form attachments to this report:

- Photographs first-of-type example R66 Serial number 015 ZK-HAG
- Three-view drawing Robinson Helicopter Company Model R66
- Copy of FAA Type Certificate Data Sheet Number R00015LA

## Sign off

.....  
 David Gill  
 Team Leader Airworthiness

.....  
 Checked – Owen Olls  
 Continuing Airworthiness Specialist

## Appendix 1

### List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
R66	Robinson Helicopter Company	11/21B/21	13 April 2011