

---

# **Type Acceptance Report**

**TAR 19/21B/18**

**SIKORSKY S-92A**



## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>1</b>
<b>1. INTRODUCTION</b>	<b>1</b>
<b>2. AIRCRAFT CERTIFICATION DETAILS</b>	<b>2</b>
<b>3. APPLICATION DETAILS AND BACKGROUND INFORMATION</b>	<b>3</b>
<b>4. NZCAR §21.43 DATA REQUIREMENTS</b>	<b>4</b>
<b>5. NEW ZEALAND OPERATIONAL RULE COMPLIANCE</b>	<b>9</b>
<b>ATTACHMENTS</b>	<b>10</b>
<b>APPENDIX 1</b>	<b>10</b>



## Executive Summary

New Zealand Type Acceptance has been granted to the Sikorsky S-92A helicopter based on validation of FAA Type Certificate number R00024BO. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Section 2, 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. 19/21B/18 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 in New Zealand; and
- (b) Identify any special conditions for import applicable to any model 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.

## 2. Aircraft Certification Details

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

TC Holder:	Sikorsky Aircraft Corporation
Type Certificate:	R00024BO
Issued by:	Federal Aviation Administration
Manufacturer:	Sikorsky Aircraft Corporation
Production Approval:	FAA PC105
Manufacturer:	Keystone Helicopter Corporation
Production Approval:	FAA PC121NE (Some serial numbers in the range 920127 through 920142)

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

(i) <b>Model:</b>	S-92A
MCTOW:	26,500 lb [12,020 kg] 27,700 lb [12,564 kg] – with Gross Weight Expansion kit 28,300 lb [12,836 kg] – with external load
Max. No. of Seats:	3 crew, 19 passenger maximum
Noise Standard:	FAR Part 36 Appendix H
<b>Engine:</b>	General Electric CT7-8, CT7-8A or CT7-8A6
	Type Certificate: E8NE
	Issued by: Federal Aviation Administration

### 3. Application Details and Background Information

The application for New Zealand type acceptance of the Sikorsky S-92A was from the type certificate holder dated 12 December 2018. The S-92A is a nineteen passenger seat twin-turbine Transport Category helicopter intended for airline or executive transport, offshore oil support and search and rescue operations. As part of the type acceptance process a team from the CAA Airworthiness Unit visited Sikorsky for a familiarisation/validation visit.

Type Acceptance Certificate Number 19/21B/18 was granted on 27 March 2020 to the Sikorsky S-92A based on validation of FAA Type Certificate R00024BO. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The Sikorsky S-92A was an all-new design using some rotor system design features from the Blackhawk helicopter. It has a conventional aluminium structure with some composite parts and highly integrated Rockwell Collins digital avionics. It is powered by two FADEC controlled GE Model CT7-8 engines and incorporates an auxiliary power unit for engine starting and back-up electrical power. Development started in 1990 and the type certificate was issued in December 2002. The first production example was delivered in 2004.

#### **Configurations:**

The S-92A is available in several significant configurations and/or equipment options:

- Ditching Equipment – This consists of flotation bags and liferafts and is available in different levels of equipment for meeting up to Sea State 6.
- External Lifting Equipment – This can be either of a rescue hoist mounted outside the RHS front door, or a central fuselage mounted cargo hook.
- Rotor Blade Ice Protection System (RIPS) – This installs a spanwise electrothermal heating element bonded into the leading edge of each main and tail rotor blade that will automatically adjust to changing environmental conditions.

There are approved layouts for a 9-seat VIP interior and a 19-seat airliner cabin. There is also an option for a mixed cargo and passenger layout, although to date this configuration is only applicable to two serial numbers. The Automatic Flight Control System is available with Search and Rescue (SAR) and Rig Approach modes.

## 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 R00024BO

FAA Type Certificate Data Sheet R00024BO at Revision 21 dated Dec 19, 2014  
– Model S-92A (Category A) approved 17 December 2002  
– Model S-92A (Category B) approved 7 May 2004

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the S-92A is FAR Part 29 including Amendment 29-47. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as FAR 29 is the basic standard for Transport 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:*

No. 29-011-SC for Dual-Engine 30 Minute Power – The S-92A has 30-Second One-Engine-Inoperative (OEI), 2-Minute OEI, Continuous OEI, 30-Minute, Takeoff, and Maximum Continuous power ratings. This unusual dual-engine power capability must be limited to use for hovering operations only for periods not to exceed 30 minutes at any time after takeoff, to allow the rotorcraft to fly extended hover manoeuvres while performing search and rescue missions. This required a special condition for hovering cooling test procedures and powerplant limitations.

No. 29-008-SC for High Intensity Radiated Frequency – To protect systems that perform critical control functions, or provide essential display functions, from the effects of high-intensity radiated fields (HIRF) this special condition specified the electromagnetic spectrum and test conditions after exposure to which critical functions of systems must be maintained.

*With Search and Rescue Automatic Flight Control System Installation:*

No. 29-023-SC for Installation of a Search and Rescue (SAR) Automatic Flight Control System (AFCS) – In the SAR mode a fully coupled autopilot provides operational profiles to enable the pilot to fly fully coupled manoeuvres, to include predefined search patterns during cruise flight, and to transition to a stabilized hover and departure. This Special Condition contained detailed requirements on performance, flight characteristics and equipment and systems for operations below instrument flight minimum speed ( $V_{MINI}$ ).

(iii) *Equivalent Level of Safety Findings:*

Number TC0309BO-R/F-1 – FAR §29.173 Static longitudinal stability and §29.175 Demonstration of static longitudinal stability – The current airworthiness requirements specify forward motion of the longitudinal cyclic control be necessary to increase speed to greater than the trim speed. The ELOS was based on an NPRM proposal to allow neutral or negative static stability in limited areas of the flight envelope if adequate compensating characteristics are present and the pilot can maintain airspeed within 5 knots of the desired trim speed.



Number TC0309BO-R/F-4 – FAR §29.177 Static directional stability – FAR 29.177 requires that static directional stability be positive with throttle and collective held constant at FAR 29.175 trim conditions, with a steady increase in sideslip angle with directional control deflection. The ELOS was based on an NPRM proposal to change demonstration criteria to provide a definition of the sideslip envelope over which directional stability characteristics are evaluated, and allow a minimal amount of negative stability around each trim point. Sideslip angles must increase with directional control deflection for a specified range of angle options.

Number TC0309BO-R/P-1 – FAR §29.1305(a)(24) Power Plant Instruments – This requires that an individual indicator, warning or caution device be provided for each of the following parameters if exceeding the APU limits for either gas temperature, oil pressure or turbine rotor speed can be hazardous. The S-92A has only one annunciator that will illuminate upon exceedance of any one (or more) of these three parameters because pilot action is the same for any of these conditions.

Number TC0309BO-R/P-5 – FAR §29.1 181(a)(4) Designated Fire Zones; Regions Included – The S-92A APU installation is not in a typical enclosure and does not provide for a dedicated compartment that would be classified as a “Fire Zone”, nor is the APU completely isolated from the rest of the rotorcraft by firewalls, shrouds, or equivalent means. Although this firewall configuration has been certified for installation on other helicopters with similarly configured turbine engines Sikorsky was required to address a number of design issues: The APU Hot Section had to be contained in a firewall enclosure and isolated from the accessory section; APU inlet is fireproof such that no hazardous quantity of air, fluid or flame can pass through to the accessory gear box region; APU high pressure fuel line is contained within a fire proof Fuel Control Box (FCU); and Customer Bleed air line is insulated so the surface temperature is below the auto-ignition temperature.

*When anticollision light installed iaw Sikorsky Drawing 33792-52871:*

Number AT1610BO-R-S-1 – FAR §29.1401(d) Anticollision light system – The S-92A anticollision light is a dual color cockpit selectable aviation red or aviation white. It had to be prohibited in the RFM from operation in IMC and night operations, and show by flight evaluation that any cockpit glare and reflection was no worse than existing aviation red only anticollision lights.

*With a Combination Passenger and Cargo Configuration:*

Number TD1454BO-R-S-1 FAR §29.855(a)(1),(d) Cargo & baggage compartments – The cabin windows do not meet the requirement that accessible and inaccessible compartments not occupied by passengers or crew must be fire resistant. In addition the cabin partition does not prevent the accumulation of harmful quantities of smoke, fire extinguishing agent and noxious gases in adjacent compartments. Four compensating factors provide adequate smoke/fire detection and emergency reaction time to land and evacuate prior to PBE available oxygen depletion.

Number TD1454BO-R-C-1 – FAR §29.809(a) Emergency exit arrangement and FAR §29.813(c)(2) Emergency exit access – An exit must have an unobstructed opening to the outside. For rotorcraft with a passenger seating capacity of 19 or less a minor obstruction is allowed in the projected opening for not less than the width of the narrowest seat, if there are compensating factors for the effectiveness of the exit. In the case of the side facing utility seats (SFUS) they are lightweight and easily removed. In addition the S-92A has more exits than required.

*With Passenger Configuration with Side Facing Executive Seats:*

Number AT01655BO-R-C-2 – FAR §29.809(a) Emergency exit arrangement and FAR §29.813(c)(2) Emergency exit access – Similar to Issue Paper C-1 above the side-facing executive seats protrude into the exit opening. The seats have a simple to use back break over design, whose capability has been shown by an emergency evacuation demonstration. This is supported by placards and RFM procedures. The helicopter also has more than the minimum exits.

(iv) *Airworthiness Limitations:*

See the Airworthiness Limitations and Inspection Requirements Manual, Document SA S92A-AWL-000. For Airworthiness Limitations and Inspection requirements for gross weights above 26,500 pounds, see document number SIC920010.

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The S-92A is certificated for noise under FAR 36 Appendix H (Stage 2 Limits) Amendment 24; and ICAO Annex 16 Chapter 8 Amendment 7 Paragraph 8.4.1.

(ii) *Compliance Listing:*

SER-920259 S-92 Noise Certification Compliance Report

Helicopter Configuration:	Flight Condition:		
	Takeoff:	Flyover:	Approach:
S-92A at 26,500 lb Gross Weight	94.5 EPN dB	97.2 EPN dB	97.5 EPN dB
S-92A at 27,700 lb Gross Weight	94.8 EPN dB	97.4 EPN dB	97.7 EPN dB

(4) Certification Compliance Listing:

Sikorsky S-92A Type Certification Program – TC0309BO-R – Type Certificate Number R000024BO – December 17, 2002 – Certification Summary Report

S-92A Compliance Matrix dated 9/13/2018

S-92A Certification Plan – Search and Rescue (SAR) Aircraft Options

(5) Flight Manual:

The S-92A may be delivered with optional engines and equipment for ditching, external lift, search and rescue, and other types of operation. To reduce the need for flight manual supplements, Sikorsky initially produced different Rotorcraft Flight Manual (RFM) versions for the major helicopter configuration differences, each with a different publication number. The required RFM by number and revision, listed by aircraft serial number, determined at the time of delivery is specified in the FAA Approved Flight Manual Control Document, Sikorsky Publication number SA S92A-FMCD-000. Sikorsky has since moved away from this original policy and is working to standardise on one RFM version, which will be S92A-RFM-003. In addition to the RFM documents below, Sikorsky also provides Rotorcraft Flight Manual Supplement (RFMS) documents for various options or types of operation.

Details of the current FAA-Approved Rotorcraft Flight Manuals for the S-92A with the CT7-8A engine, and the CAA acceptance AIR number, are as follows:

<b>Publication No.:</b>	<b>Helicopter Configuration:</b>	<b>AIR Number:</b>
S92A-RFM-000	Production “Green” helicopter	Not assigned
S92A-RFM-001	CT7-8 engine – RFM now obsolete	Not assigned
S92A-RFM-002	Ditching Equipment/AMS 3.1 Software	Not assigned

S92A-RFM-003	Ditching Eqpt/External Lift Equipment/RIPS	AIR 3936
S92A-RFM-004	Rotor Icing Protection System (RIPS)	AIR 3937
S92A-RFM-005	Ditching Eqpt (Emergency Flotation/Life Rafts)	AIR 3938
S92A-RFM-006	Ditching Equipment and RIPS	AIR 3939

## (6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

Maintenance Manual for Model S-92A – Publication No. SA S92A-AMM-000

Airworthiness Limitations and Inspection Requirements for Sikorsky Helicopter Model S-92A – Publication No. SA S92A-AWL-000

S-92A Airworthiness Limitations and Inspection Requirements Gross Weight Expansion Supplement No. 1 – Document No. SIC920010

Corrosion Control Manual for Model S-92A – Publication No. SA S92A-CCM-000

Structural Repair Manual for Model S-92A – Publication No. SA S92A-SRM-000

Wiring Manual for Sikorsky Model S-92A – Publication No. SA S92A-WDM-000

Wire System Manual for Model S-92A – Publication No. SA S92A-WSM-000

Wire System Repair Manual Model S-92A – Publication No. SA S92A-WSR-000

HUMS User Guide for Model S-92A – Publication No. SA S92A-HUM-000

Sikorsky Ground Based Application (SGBA) Users Guide for Sikorsky Helicopter Models S-92 and S-76D – Publication No. SA S92A-GBA-000

(ii) *Current service Information:*

Alert Service Bulletins and Service Bulletins are available on Sikorsky360

(iii) *Illustrated Parts Catalogue:*

Not produced separately. (The MM includes illustrated parts breakdowns.)

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

CAANZ access is provided to documentation through the Sikorsky360 website

## (8) Operational Approvals:

See RFM Part 1 Section 1 Operating Limitations:

Types of Operation:

Category “A” with a maximum of 19 passenger seats or Category “B” with 9 or less passenger seats; Day, Night, VFR and IFR.

FMS Operational Approvals:

The UNS-1Esp Flight Management System (FMS) has been demonstrated capable of, and been shown to meet the requirements for the following operations:

1. VFR/IFR enroute, terminal and instrument approach (GPS stand-alone and GPS overlay VOR, VOR-DME, NDB, and RNAV) operation within the U.S. National Airspace System using the WGS-84 coordinate reference datum. Satellite navigation is based upon use of only the Global Positioning System (GPS) operated by the United States.

2. RNP5/BRNAV - Provided it is receiving usable navigation information from one or more of the following: a. GPS; b. One VOR/DME or multiple DMEs.

3. Vertical Navigation (VNAV) Enroute, Terminal, and Approach operations, provided the FMS is receiving usable navigation information. Note, use of P-ILS mode is authorized to provide vertical guidance during GPS based instrument approach procedures.

4. Use of Barometric VNAV to conduct RNAV instrument approach procedures published with a VNAV Decision Altitude (LNAV/VNAV minimums).

(9) Other information:

FAA Master Minimum Equipment List (MMEL) Sikorsky S-92A

EASA Operational Suitability Data (OSD) – Flight Crew – Sikorsky S-92A

Report No. EL04354 – Electrical Load Analysis – Sikorsky S-92A S/N 920289

## 5. New Zealand Operational Rule Compliance

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	Exit markings found compliant by ground inspection
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 §29.783(c) and (e) and FAR §29.807 (b)
E.2.1	Emergency Exit Marking	FAR §29.811(b) and (f)

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	Seats and harnesses are approved to FAR §25.562 / §25.765
91.507	Pax Information Signs – Smoking, safety belts fastened	Fitted as standard equipment *
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	FAR §29.1303(a) N/A – No mach no. limitations FAR §29.1303(b) FAR §29.1303(c) FAR §29.1305(a)(3) FAR §29.1305(a)(13)(14) FAR §29.1305(a)(6)
91.511 Night	(1) Turn and Slip (2) Position Lights	FAR §29.1303(g) FAR §29.1385
91.513	VFR Communication Equipment	The S-92A is fitted with a Collins Proline based avionics system which includes: * Universal UNS-1E spw Flight Management System (FMS) with SBAS GPS) Dual Digital 4-Axis Automatic Flight Control System (AFCS); Dual VHF-4000; Dual VIR-423; ADF-462; DME-442; Dual ADC; Dual AHRS; Primus 660 Wx Honeywell MK XXII Enhanced Ground Proximity Warning System (EGPWS) (+) Honeywell KTA-970 Traffic Alert and Collision Advisory System (TCAS I) (+)
91.517	IFR Instruments and Equipment	
91.519	IFR Communication and Navigation Equipment	
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	First Aid kit fitted as standard equipment * Three fire extinguishers fitted as standard in cabin/cockpit * Not Applicable – Less than 20 passenger seats Not Applicable – Less than 61 passenger seats
91.529	ELT – TSO C126 406 MHz after 22/11/2007	Artex C-406-N ELT fitted as standard *
91.531	Oxygen Indicators – Volume/Pressure/Delivery	Not fitted as standard equipment
91.533	Oxygen 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 – Therapeutic for 1% of Pax – 120l PBE for each crew member	TCDS Altitude Limits: Takeoff and landing: 11,000 feet density altitude Enroute: 15,000 feet density altitude 10,000 feet pressure altitude in icing conditions
91.541	SSR Transponder and Altitude Reporting Equipment	TDR-94D Mode S Tx fitted as standard * (ADS-B optional)
91.543	Altitude Alerting Device – Turbojet or Turbofan	Altitude alerting is an available function of the AFCS
91.545	Assigned Altitude Indicator	Not Applicable
A.15	ELT Installation Requirements	Factory mount on RHS Cabin found compliant by inspection

\* See Document: Sikorsky S-92A Helicopter Configuration – Part 1 S-92A Baseline

## 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 §29.785
135.357	Additional Instruments (Powerplant and Propeller)	FAR §29.1305
135.359	Night Flight	Fitted as standard equipment *
135.361	IFR Operations	Fitted as standard equipment *
135.363	Emergency Equipment (Part 91.523 (a) and (b))	Fitted as standard equipment *
135.367	Cockpit Voice Recorder	Curtiss-Wright (previously Penny & Giles model D51615-142 CVR/FDR) MPFR fitted as standard* EASA and FAA approved to ETSO-C123b and ETSO-C124b Installed in compliance with FAR §29.1457 and FAR §29.1459 at Amendment 29-52
135.369	Flight Data Recorder	
135.371	Additional Attitude Indicator	Fitted as standard equipment *

\* See Document: Sikorsky S-92A Helicopter Configuration – Part 1 S-92A Baseline

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:

Three-view drawing Sikorsky Model S-92A

Copy of FAA Type Certificate Data Sheet Number R00024BO

## Sign off

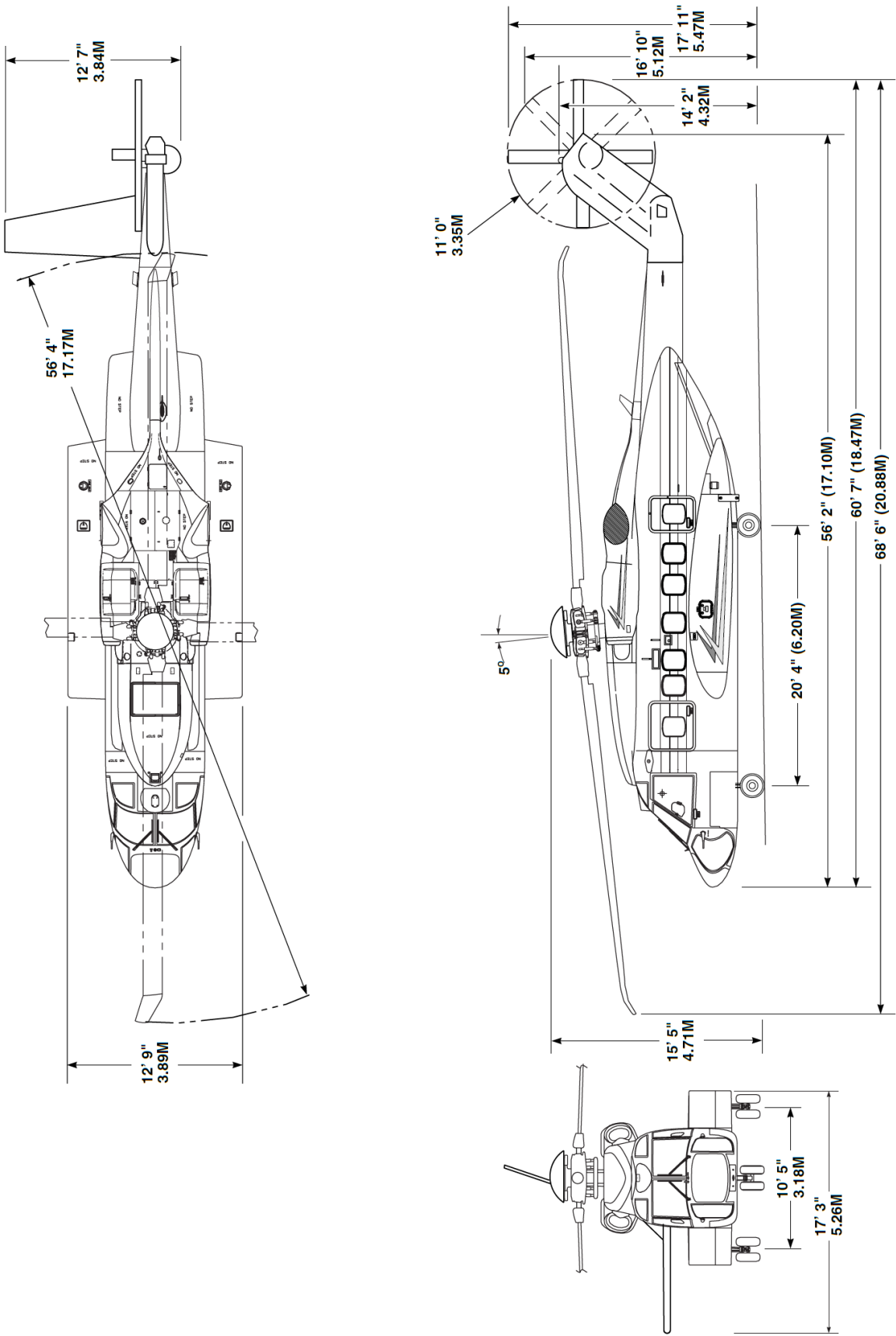
.....  
David Gill  
Team Leader Airworthiness

.....  
Checked – Rens Molenaar  
Airworthiness Engineer

## Appendix 1

### List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
S-92A	Sikorsky Aircraft Corporation	19/21B/18	27 March 2020



Aircraft Dimensions