Civil Aviation Administration of China (CAAC)

Aircraft Evaluation Group (AEG)

Aircraft Evaluation Report

For

AS332 Series

(AS332 C1e/L1e)

Initial **Date: 03/December/2018**

Manufacturer: Airbus Helicopters

Revision Record & Approval

Rev. No.	Section	Highlight	Date	Prepare	Review	Approve
Initial	All	Initial Evaluation for AS332 C1e, L1e.	DEC 3, 2018			

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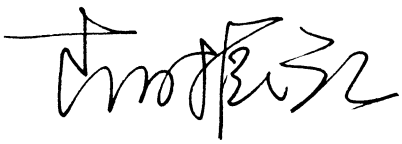

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Foreword

Airbus Helicopters AS 332 series helicopters include following models under the same TC:

- AS 332 C, L, C1, L1
- AS 332 L2
- EC 225 LP

Note: C, L features two fuselage length configurations, C for standard and L for extended body; the number after C or L represent engines configurations.

Super Puma is used as commercial designation for AS 332/EC 225 series helicopters, and SA 330 J is the very early model in the series.

AS332 C, C1, L and L1 in commercial designation called as Super Puma Mk I, AS332 L2 in commercial designation called as Super Puma Mk II, EC225 LP in commercial designation called as Super Puma Mk II+ or LP.

Commercial references AS332 C1e and AS332L1e (Also called AS332e) are used for AS332C1 and AS332L1 post modification AHCAS.

H215 is used as new commercial reference for AS332e, consequently, H225 is used as new commercial reference for EC225 LP.

H215 and H225 are the current in production models for Super Puma series helicopters.

CAAC AEG evaluation of Super Puma series helicopters was initial conducted for AS332 C1e, L1e in March 2017, AS332 C, C1, L, L1and EC225 LP catch up involved but just with necessary information only instead of complete evaluation. Initial version of this report was formalized based on the evaluation.

Note:【Caution】in this report means *the finding(s) made by CAAC AEG evaluation, which may need pay attention by Chinese operators when importing or operating the aircraft, but it is up to the operators to accept the finding(s) and take responsible for any risk(s) of safety, operation or economic influence.*

Section 1: Operational Information Related to Aircraft Type Design

1.1 Statement and Explanation:

This section includes the operation related information for AS332 C 1e and AS332 L1e helicopters mainly based on the following documents issued or approved by EASA and validated (or to be validated) by CAAC:

- EASA Type Certificate Data Sheet (TCDS) No. EASA.R.002, Issue 15.
- COMPLEMENTARY FLIGHT MANUAL AS 332 C1 FOR AIRCRAFT EQUIPPED WITH MODIFICATIONS 0726640, 0726641, 0726642, 0726643, 0726644, 0726645, 0726646, 0726647, 0726648, 0726649 and 0726650 (COMMERCIAL DESIGNATION AS 332 C1e), Revision 6.
- COMPLEMENTARY FLIGHT MANUAL AS 332 L1 FOR AIRCRAFT EQUIPPED WITH MODIFICATIONS 0726640, 0726641, 0726642, 0726643, 0726644, 0726645, 0726646, 0726647, 0726648, 0726649 and 0726650 (COMMERCIAL DESIGNATION AS 332 L1e), Revision 3.

The information is provided as an aid to support operation approval but should not be considered operation approval. If operator is required to show compliance, it remains the responsibility of the Principal Inspector (PI) for operator to approve the appropriate operation.

When the aircraft configuration differs from the above stated airworthiness approval, it is the responsibility of the operator and its Principal Inspector (PI) to evaluate those differences and develop the compliance to the relevant requirements.

1.2 AS332 C1, L1 (C1e and L1e)

(1) General Information

Item		Type Related Information
1.1	Category	Transport Rotorcraft *Category A and B*
1.2	Dimensions	AS 332 C1: -Length 15,53m -Width 3,79m -Height 4,94m AS 332 L1: -Length 16,29m -Width 3,79m -Height 4,95m
1.3	Engines	Two Turboméca MAKILA 1A1
1.4	APU	Not applicable
1.5	Propellers	Not applicable
1.6	Maximum Operating Altitude	Take-off and landing: - 1.640 ft. pressure altitude / 15.000ft density altitude En route: - 1.640 ft./25.000ft pressure altitude for M ≤ 8,350 kg (18,410 lb.) - 1.640 ft./ 9.500ft pressure altitude for M > 8,350 kg (18,410 lb.)
1.7	Approach category	Not applicable
1.8	Maximum Certified Weights	Maximum mass 8.600kg (18.960lb)
1.9	Minimum Flight Crew	VFR: 1 pilot IFR: 2 pilots
1.10.	Maximum Occupants	AS 332 C1: 19 AS 332 L1: 24
1.11.	Baggage/ Cargo Compartment	The cabin floor (from + 2,48m to + 7,63m) is provided with the structural strength required for a load of 800kg/m2 evenly distributed in cargo configuration
1.12	Serial Numbers Eligibility	2001 and subsequent of AS 332 C, conversion from AS 332 C to AS 332 C1 is possible through SB 01.00.26. 2132 and subsequent of AS 332 L1.

(2) Kind of Operation

Item		Information
2.1	Visual Flight Rules(VFR)	Certified for VFR Day and Night
2.2	Instrument Flight Rules	Certified for IFR Day and Night.

Item		Information
	(IFR)	
2.3	Night and over-the-top	Certified for VFR/IFR Day and Night.
2.4	Icing conditions	Flight in full icing conditions is permitted on AS 332 L1 only when equipment items listed in relevant flight manual supplement are installed.
2.5	Extended Overwater Operation	Not applicable
2.6	Extended Range Operation	Not applicable

(3) Communication, Navigation and Surveillance

Item		Information
3.1	ATC transponder	COLLINS TDR94D-409 with extended squitter capability as standard configuration
3.2	Data Link Communication	Not available
3.3	Satellite Communication (SATCOM)	Not available
3.4	RVSM	Not applicable
3.5	Performance Based Navigation	B-RNAV, P-RNAV, RNP APCH LNAV (CMA9000 MULTI-SENSOR FMS software version < V310)
3.6	Low visibility operation	Not certified.
3.7	Weather radar	RADAR TELEPHONICS 1600
3.8	Terrain awareness and warning system （TAWS）	Not available
3.9	Traffic Alert and Collision Avoidance equipment	Optional equipment TCAS I , HP899 , software 1.8
3.10	Low altitude windshear system equipment	Not applicable
3.11	ADS-B	Not available
3.12	HUD	Not applicable

(4) Recording Equipment

Item		Information
4.1	Flight recorder	Combined Voice & Flight Data Recorder (CVFDR)
4.2	Quick Access Recorder	Not available

1.3 EC225 LP (Partial only)

(1) General Information

Item		Type Related Information
1.1	Category	Transport Rotorcraft *Category A and B*
1.2	Dimensions	Fuselage -Width 3,96m -Height 4,97m Main Rotor: 5 blades Diameter 16,20m Tail Rotor: 4 blades Diameter 3,15m
1.3	Engines	Two Turboméca Makila 2A or 2A1
1.4	APU	Optional and to be used on ground only.
1.5	Propellers	Not applicable
1.6	Maximum Operating Altitude	EC 225 LP Standard: Take-off and landing: - OAT from -45°C to -12°C: – 6.000ft density altitude, + 7.400ft density altitude - OAT from -12°C to ISA +40°C (without exceeding +50°C): – 2.000ft pressure altitude, + 7.400ft density altitude En route: - OAT from -45°C to -12°C: – 6.000ft density altitude, + 20.000ft pressure altitude - OAT from -12°C to ISA +40°C (without exceeding +50°C): – 2.000ft pressure altitude, + 20.000ft pressure altitude.
1.7	Approach category	Not applicable
1.8	Maximum Certified Weights	Maximum mass for Take-off and landing: 11.000kg (24.251lb)
1.9	Minimum Flight Crew	VFR: 1 pilot IFR: 2 pilots; Pilot and suitably trained crew member in day VFR for water bombing operations
1.10.	Maximum Occupants	Maximum Passenger Seating Capacity: 25
1.11.	Baggage/ Cargo Compartment	The cabin floor (from + 2,48 m to + 7,63 m) is provided with the structural strength required for a load of 800kg/m2 evenly distributed in cargo configuration.
1.12	Serial Numbers Eligibility	2600 and subsequent

(2) Kind of Operation

Item	Information

Item		Information
2.1	Visual Flight Rules(VFR)	Certified for VRF Day and Night.
2.2	Instrument Flight Rules (IFR)	Certified for IFR Day and Night.
2.3	Night and over-the-top	Certified for VFR/IFR Day and Night.
2.4	Icing conditions	Flight in full icing conditions is permitted only when other equipment items as listed in relevant approved Flight Manual supplement are installed.
2.5	Extended Overwater Operation	Not applicable
2.6	Extended Range Operation	Not applicable

Section 2: Pilot Qualification Specification

2.1 Statement and Explanation

This section is the formal notification that the CAAC AEG has conducted pilot qualification specification evaluation of AS332 C1e and AS332 L1e helicopters based on the EASA Operation Suitability Data (OSD) process and determination for flight crew, which specifies the pilot type rating, training, checking, and currency specifications for flight crews.

Hereby, the provisions in this section can be used as the basis for Chinese operators to develop their pilot qualification and training program for above Helicopters.

Alternate means of compliance to the requirements of CCAR 61, 91 and 135, other than specified in the provisions of this section, must be approved by Flight Standards Department of the CAAC. If an alternate means of compliance is sought, operators will be required to show the CAAC that the proposed alternate means of compliance will provide an equivalent level of safety to the provisions of this section. This may be accomplished by submitting analysis, demonstrations, proof of concept testing, differences in documentation, and other supporting evidences to the CAAC.

Find EASA Approved OSD here:

The Super Puma Fleet Operational Suitability Data (OSD) for Flight Crew may request from Airbus point of contact: information.osd-airbushelicopters.ahd@airbus.com, and also published on Airbus Helicopter TIPI website.

2.2 Pilot Type Rating and Licence Endorsement

Upon the AEG evaluation, the Pilot Type Rating for AS332 C1e and AS332 L1e Helicopters is listed as follows:

Manufacturer	Aircraft Type	Pilot Type Rating
Airbus Helicopters	AS 332 C, L, C1, L1	AS332
	AS 332 C1e, L1e	AS332e
	EC 225 LP	EC225

Note: *Even EASA determined same type rating for all Super Puma Fleet in OSD-FCL as "AS332/EC225", but as for the real situation of the possibility of Super Puma series helicopters operation in China and policy of CAAC, CAAC determined the difference type rating as "AS332" for*

AS332 C, L and C1, L1, "AS332e" for AS332 C1, L1 post modification AHCAS and "EC225" for EC225 LP.

License endorsement:

"AS332e" for getting a type rating from either AS332 C1e or AS332L1e, and checking records should also be shown for specific type.

2.3 ODR and MDR

Operator Differences Requirements (ODR) and Master Differences Requirements (MDR) tables for Super Puma helicopters have been given in EASA OSD-FCL for *Super Puma* Fleet, but as AS332 C1e and AS332 L1e have only difference in fuselage length, no ODR necessary. CAAC AEG concludes the MDR with reference to EASA OSD-FCL as follows:

MDR Table

		FROM AIRCRAFT		
		AS332 (C, L, C1, L1)	**AS332e (C1e, L1e)**	**EC225 LP**
TO AIRCRAFT	**AS332 (C, L, C1, L1)**	**--**	**E/D**	**E/E**
	AS332e (C1e, L1e)	**E/D**	**--**	**E/C**
	EC225 LP	**E/E**	**E/C**	**--**

Note: *As for AS332 C, L, C1, L1 and EC225 LP all considered legacy aircraft for CAAC, above MDR only used for support CAAC type rating determination, but difference training may adopted for AS332 C1e, L1e and EC225 LP as CAAC considered they are related aircraft.*

2.4 Specification for Training

The Type Rating Training Courses proposed by Airbus Helicopters for AS332 C1e and AS332 L1e helicopters are as follows and they have to be considered as the basis when developing pilot training program.

- H215 (AS332 C1e/L1e) - H225 (EC225 LP) and AS332 (AS332C, C1, L, L1) Training Syllabus for operators of CAAC registered aircraft (document reference ETS EI025 AS332/AS332e/EC225 CAAC A).

Note 1: *Even this report only for AS332e (H215), above training syllabus includes H215, EC225 LP (H225) and AS332 training courses.*
Note 2: *As currently no H215 Flight Simulate Training Device (FSTD) has been developed, two different H215 transition training options are proposed for the practical phase:*

- *With the use of H225 FSTD and H215 aircraft, or*
- *Without the use of H225 FSTD (H215 aircraft only).*

Both options (H215 Flight Training program with the use of H225 FSTD or H215 Flight Training program without the use of H225 FSTD (A/C only)) are provided in above training program.
Note 3: *As there is less possibility of conduct difference training from H215 to H225, the training course from H215 to H225 not addressed in above training program.*
Note 4: *The above training courses are available from Airbus Helicopters.*

Specifications for particular emphasis elements during training are included in above training program.

2.5 Specification for Checking

As required by CCAR Part 61 and 135.

2.6 Specification for Currency

As required by CCAR Part 61 and 135.

2.7 Specification for Flight Simulation Training Devices

There is no any FSTD has been developed for AS332 C1e and AS332 L1e helicopters.

Section 3: Maintenance Personnel Qualification Specification

3.1 Statement and Explanation

This section is the formal notification that the CAAC AEG has conducted maintenance personnel qualification evaluation for AS332 C1e and AS332 L1e helicopters based on the documentation provided by Airbus Helicopters.

Thus, the provisions in this section can be used as the basis for Chinese operators to develop their maintenance personnel qualification and training program for above helicopters.

Alternate means of compliance other than specified in the provisions of this section must be approved by Flight Standards Department of the CAAC.

3.2 Maintenance License Endorsement

Upon the AEG evaluation, the maintenance personnel license endorsement for AS332 C1e and AS332 L1e helicopters is listed as follows:

Manufacturer	Aircraft Type/Model	License Endorsement
Airbus Helicopters	AS332 C, L, C1, L1	AS332
	EC225 LP	EC225

Note: *Since AS332 C1e, L1e is just the Commercial references for AS332 C1 and AS332 L1 post modification AHCAS, it is covered by AS332 C1, L1.*

License endorsement:

"AS332" is the type endorsement for any of AS332 C, L, C1 or L1; "EC225" is the type endorsement for any of EC225 LP. CCAR-147 training certificate or equivalent training document should show the specific type and engine combinations.

3.3 Specification for Training

The maintenance training syllabus proposed by Airbus Helicopters for AS332 C, L, C1, L1 and EC225 LP Helicopters is as follows. Operators and maintenance training providers should consider these courses as a baseline when developing maintenance training program:

- Eurocopter AS332 (Turbomeca Makila 1A/1A1) T1 AIRFRAME TYPE RATING TRAINING
- Turbomeca MAKILA 1A/1A1 SAFRAN HELICOPTERS ENGINES APPENDIX
- Eurocopter AS332 (Turbomeca Makila 1A/1A1) T2 TYPE RATING TRAINING

- Eurocopter EC225 (Turbomeca Makila 2A) T1 AIRFRAME TYPE RATING TRAINING
- Eurocopter EC 225 (Turbomeca Makila 2A) T2 TYPE RATING TRAINING
- Turbomeca MAKILA 2A SAFRAN HELICOPTERS ENGINES APPENDIX

Note 1: *The above maintenance training syllabus covers both theoretical and practical training for ME, AV, which equivalent to T1, T2 mentioned above. ENGINES APPENDIX is additional information for engine training part.*

Note 2: *There is no difference courses between AS332 and EC225.*

Note 3: *For the aircraft options, it is the operator's responsibility to compare the detail differences based on their actual configurations; and, the differences training may be conducted by the operator or its contracted maintenance organization.*

Note 4: *The above training syllabus are available by request to Airbus Helicopters.*

Section 4: Master Minimum Equipment List

4.1 Statement and Explanation

This section is the formal notification that CAAC AEG has conducted evaluation of Master Minimum Equipment List (MMEL) for AS332 C1e and AS332 L1e helicopters based on EASA approval process, and considering the following MMEL outlines the items of equipment that may be inoperative and yet maintain an acceptable level of safety by appropriate conditions and limitations.

- MASTER MINIMUM EQUIPMENT LIST / AS 332 C-C1-L-L1
- MASTER MINIMUM EQUIPMENT LIST SUPPLEMENT AS 332 C1-L1 Post MOD 07 26640 to 07 26650 (COMMERCIAL DESIGNATION AS 332 C1e-L1e)

Note: *This MMEL Supplement must only be used in conjunction with the AS 332 C-C1-L-L1 MMEL.*

Hereby, the MMEL and its future revisions published by EASA can be used as a basis for operators to develop their Minimum Equipment List (MEL) for the above helicopters.

Find EASA MMEL here:

The above MMEL distributed by Airbus Helicopters on KeyCopter website, and EASA approval reference is available by request to Airbus Helicopters.

4.2 CAAC Supplemental

Not applicable.

Section 5: Scheduled Maintenance Requirements

5.1 Statement and Explanation

There is no EASA approved MRBR for AS332 C1e and AS332 L1e helicopters, but following schedule maintenance requirements recommended by Airbus Helicopters should be followed by Chinese operator or referenced to developing their own maintenance or inspection program:

- AS332 AIRWORTHINESS LIMITATIONS SECTION (ALS) / AS332 C1
- AS332 MASTER SERVICING MANUAL (MSM) /AS332 C1

- AS332 AIRWORTHINESS LIMITATIONS SECTION (ALS) / AS332 L1
- AS332 MASTER SERVICING MANUAL (MSM) /AS332 L1

Note: *The above Airworthiness Limitations Section (ALS) and Master Servicing Manual (MSM) considered as Chapter 04 and 05 of Aircraft Maintenance Manual (AMM). In meanwhile, chapter 5 also exist in MM, but only to provide detailed Work Cards.*

【Caution】

Even some terms explained in MSM similar to MSG-2 or MSG-3 documents, the task type, task description, interval description not presented as normal OEM's maintenance program or maintenance planning document.

5.2 CAAC Supplemental

Not applicable.

Section 6: Operational and Continued Airworthiness Instructions

6.1 Statement and Explanation:

This section is the formal notification that CAAC AEG has conducted evaluation of the operational and continued airworthiness instructions for AS332 C1e and AS332 L1e helicopter and the related Airbus Helicopters policies and procedures.

Hereby, the Operational and Continued Airworthiness Instructions documents listed below were found acceptable by the CAAC AEG that they give the necessary guidance for operating and maintaining the above helicopter within the approved operating conditions and limitations.

This acceptance does not assure the accuracy and applicability of the content in each document. It is the responsibility of the owner or the operator to report any defect or discrepancy in these documents to the aircraft manufacturer or the CAAC AEG by mail box: aeg@caac.gov.cn.

Operational & Continued Airworthiness Instructions distribution:

Flight Manuals are distributed by AH Keycopter website or hard copies, other manuals are distributed by AH Keycopter website, ORION USB, or hard copies.

6.2 List of Operational and Continued Airworthiness Instructions for AS332 C1e, L1e

Manual	Doc. No.	Description	Revision/Date
FLM	--	FLIGHT MANUAL AS 332 C1 FOR AIRCRAFT EQUIPPED WITH MODIFICATIONS 0726640, 0726641, 0726642, 0726643, 0726644, 0726645, 0726646, 0726647, 0726648, 0726649 and 0726650 (COMMERCIAL DESIGNATION AS 332 C1e)	As revised
	--	FLIGHT MANUAL AS 332 L1 FOR AIRCRAFT EQUIPPED WITH MODIFICATIONS 0726640, 0726641, 0726642, 0726643, 0726644, 0726645, 0726646, 0726647, 0726648, 0726649 and 0726650 (COMMERCIAL DESIGNATION AS 332 L1e)	As revised
QRH	--	Quick Reference Handbook / Dual Pilots / AS 332 C1e&L1e	As revised
MSM	--	AS332 MASTER SERVICING MANUAL / AS332 C1	As revised
	--	AS332 MASTER SERVICING MANUAL / AS332 L1	As revised
MET	--	AS332 MK1 MAINTENANCE MANUAL	As revised

Manual	Doc. No.	Description	Revision/Date
MDF	--	AS332 MK1 DESCRIPTION AND OPERATION MANUAL	As revised
WDM	--	Wiring Diagram Manual	As revised
MFI	--	AS332 MK1 FAULT ISOLATION MANUAL	As revised
IPC	--	AS 332 MK1 Illustrated Parts Catalog	As revised
ICO	--	AS 332 MK1 ILLUSTRATED TOOLS CATALOG	
MTC	--	ALL STANDARD PRACTICES MANUAL	As revised
LOVM	--	LIST OF VENDOR MANUALS / AS 332 - AS 532 - EC 225 - EC 725	As revised
MST	--	AS332 MK1 STORAGE MANUAL	As revised
MRM	--	AS332 MK1 MECHANICHAL REPAIR MANUAL	As revised
MRS	--	AS332 MK1 STRUCTURAL REPAIR MANUAL	As revised
SIM	--	AS332 MK1 INDEX OF MODIFICATIONS	As revised

Note 1: *Airbus Helicopters issues SB/ASB/EASB by AH TIPI website for continued airworthiness information or modifications.*

Note 2: *The Engine manuals are developed and distributed by the engine manufacturer, but Airbus Helicopters provides the following information of Engine Manufacturers Publications:*

- Turbomeca: Engine Maintenance Manuals Index

【Caution】

Even some manual stated applicable to all Airbus Helicopters products, e.g. the Standard Practices Manual (MTC), but operators should reference each specific AEG Report (if available) for confirming the applicability.

Section 7: Other Evaluation Items

7.1 Forward Observer Seat

Not applicable.

7.2 Flight Crew Sleeping Quarters

Not applicable.

7.3 Electronic Flight Bag

Not applicable.

7. 4 Emergency Evacuation Demonstration

Not applicable.

Appendix: CAAC AEG Team and Point of Contact

A: CAAC AEG Team for AS332 C1e, L1e Evaluation

Xue Shijun	Director, AEG Division, Flight Standards Department
Li Xiaolei	Engineer, AEG Office, Civil Aviation Safety & Technology Center
Tan Yunfeng	Director, AEG Office, Shenyang Aircraft Airworthiness Certification Center

B: Airbus Helicopters Point of Contact

Ludovic VIGNAROLI	International Certification Engineer (ICE)
LI Sheng (Jason)	Airworthiness Manager, Airbus Helicopters China