Civil Aviation Administration of China (CAAC)

Aircraft Evaluation Group (AEG)

Aircraft Evaluation Report

For

Bell 412EP and 412EPI

Revision 0 December 17, 2014

Manufacturer: Bell Helicopter Textron

Revision Record & Approval

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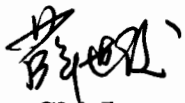

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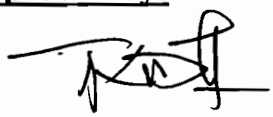

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Foreword

The Bell 412EP is a variant of Bell 212/412 series helicopters, which including Model 212, 412, 412EP and 412CF. In Bell 212/412 series helicopters, Mode 212, 412 and 412CF have already been as legacy models, and only 412EP is in production.

Bell 412EP was type certified by FAA in 1994 as transport helicopter, both category B and A, and apply for CAAC type validation in 2013.

Bell 412 EPI is commercial name for STC modification with engine change and avionics upgrade, and current production mode still need first produce a 412EP, and convert by STC to 412EPI.

Upon the application of Bell, CAAC AEG has evaluated Bell 412EP and 412EPI in January 2014. After that CAAC AEG has conducted FSB evaluation of Bell 412EPI in September 2014. Revision 0 of this report was composed after CAAC AEG evaluation.

Note: *Even Bell Model 212 was also type validated by CAAC, but as considered to already out of production and the small fleet size in China, no catch-up evaluation was conduct for this type helicopter. The operator may keep the operations as already approved, but may not possible take any advantage of credit with Bell 412EP or 412EPI.*

Section 1: Pilot Type Rating and Qualification Specification

1.1 Statement and Explanation

This section is the formal notification that CAAC AEG has conducted a Flight Standardization Board (FSB) evaluation for Bell 412EP and 412EPI helicopter, and concluded the pilot type rating, training, checking, and currency specifications for the flight crews.

Note 1: *As FAA AEG didn't conduct FSB evaluation to Bell 412EP and 412EPI, and no type rating requirement for Model 412EP and 412EPI primarily as a result of not exceeding the weight criteria of over 12,500 pounds, the above FSB evaluation is not based on or reference to FAA FSB evaluation.*

Note 2: *EASA has conducted OEB evaluation to Bell 412EP and published an OEB report, it is referenced during CAAC AEG evaluation.*

Hence, the provisions in this section can be used, as the basis, by Chinese operators to develop their pilot qualification and training program.

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

Find EASA Report here:
http://easa.europa.eu/certification/flight-standards/OEB-final-report.php

1.2 Pilot Type Rating and Licence Endorsement

Upon the CAAC AEG evaluation, the Pilot Type Rating requirement for Bell 412EP and 412EPI is as following:

Manufacturer	Aircraft Type	Pilot Type Rating
Bell Helicopter Textron	Bell 212	BH-212
	Bell 412EP	BH-412EP
	Bell 412EPI	

License endorsement:

"**BH-212**" for getting a type rating from Bell 212;
"**BH-412EP**" for getting a type rating from Bell 412EP or 412EPI. Checking records should also be shown for the specific aircraft type.

1.3 ODR and MDR

Reserved.

1.4 Specification for Training

The Type Rating Training Course for Bell 412EP and 412EPI proposed by Bell is provided as bellow, and has to be considered as a minimum:

- Pilot Training Syllabus - Bell 412EP
- Chinese Pilot Training Syllabus - Bell 412EPI

Note 1: *The pre-requisite for above training course are:*
- Hold at least Commercial Pilot License (CPL) for helicopter.
- Have experience in operations of multi-engine, turbine engine helicopter.
(If there is no above experience, additional requirements may be appropriate as determined by the POI.)
Note 2: *As there is no ODR table to support the difference analysis between Bell 412EP and 412EPI, no difference training course available between the two variant.*
Note 3: *The above training syllabus is available by request to Bell.*

The following areas of emphasis must be addressed during ground and flight training:

a) If the CAS displays an “ENG OUT” message, the pilots must pay attention to the instrument panel to distinguish which engine fails. This adds to the reaction time when it can be critical for the operation of the aircraft in emergency condition.

b) If the CAS displays an “ENG FIRE” message,, the pilot must pay attention to the

instrument panel to determine the proper action. This also adds reaction time for the pilot when it is critical during emergency condition.

c) The detent in the fly position sometimes requires the pilot to visually affirm the throttle line is properly set to the fly position. For pilots that are used to the fuel lever operation, this is an item that needs to pay additional attention.

d) The GARMIN GTN750 with integrated GPS/NAV/COM/MFD, high resolution terrain mapping function, graphical flight planning, geo-referenced charting, traffic display, multiple weather options, on a 6-inch tall system's touchscreen controls and display, there is a need to add additional practice to familiarize the operation and procedure for pilots not familiar with.

1.5 Specification for Checking

As required by CCAR Part 61 and 135.

For Bell 412EP and 412EPI mix flight operation, there is no ODR table to support the credit between the two variant.

1.6 Specification for Currency

As required by CCAR Part 61 and 135.

For Bell 412EP and 412EPI mix flight operation, there is no ODR table to support the credit between the two variant.

1.7 Specification for Flight Simulation Training Devices

As qualified per CCAR Part 60.

There is no flight simulation training devices available for Bell 412EPI configuration.

Section 2: Master Minimum Equipment List

2.1 Statement and Explanation

This section is the formal notification that CAAC AEG has conducted Flight Operation Evaluation Board (FOEB) evaluation for Bell 412EP and 412EPI helicopter based on FAA Master Minimum Equipment List (MMEL) for Bell Model 212/412 series, which outlines the items of equipment that may be inoperative and yet maintain an acceptable level of safety by appropriate conditions and limitations.

Hereby, the MMEL and its future revisions issued by FAA can be used, as the basis, by Chinese operators to develop their Minimum Equipment List (MEL) for above aircrafts. It is the responsibility of Chinese operators and the Principle Inspectors (PI) to check and verify the exact CCAR requirements for any of the contents marked or referenced with FAA regulatory document or its articles.

Note: *The applicability of FAA MMEL item majorly showed by series numbers and STC incorporation, operator need carefully check the applicable items by series number when develop MEL for 412EP or 412EPI.*

FAA MMEL distribution:

http://fsims.faa.gov/PICResults.aspx?mode=Publication&doctype=MMEL

2.2 CAAC Supplement

Reserved.

Section 3: Schedule Maintenance Requirements

3.1 Statement and Explanation

There is no Maintenance Review Board Report for the Bell 412EP and 412EPI helicopter.

Following documents could be referenced by operators for developing BELL 412EP and 412EPI maintenance or inspection program:

- Airworthiness Limitations and Inspection Requirements
- Schedule maintenance requirements
- ICA for Model 412EPI

Note 1: *Even published by a separate document, the above Airworthiness Limitations is considered as AMM Chapter 4, which will not be allowed to be escalated without approval of type certification authority, and the Inspection Requirements is considered as AMM Chapter 5, may be escalated with the supporting data by operator's reliability program.*

Note 2: *Above Airworthiness Limitations and Inspection Requirements document will be distributed by Bell together with the Operational and Continued Airworthiness Instructions.*

3.2 CAAC Supplement

Not applicable.

Section 4: Operational and Continued Airworthiness Instructions

4.1 Statement and Explanation

This section is the formal notification that CAAC AEG has conducted evaluation of the operational and continued airworthiness instructions for Bell 412EP and 412EPI helicopter based on the relevant policies and procedures of Bell.

Hereby, the Operational & Continued Airworthiness Instructions documents listed in the section 4.2 were found acceptable by CAAC AEG. CAAC AEG will give the necessary guidance for properly operating and maintaining above helicopter within the approved operating conditions and limitations.

This acceptance may not assure the accuracy and applicability of the content in each document. It is the aircraft owner's or operator's responsibility to report any defect or discrepancy in the documents to the aircraft manufacturer. And they may also report such information to CAAC AEG by the website: http://aeg.caac.gov.cn.

Operational and Continued Airworthiness Instructions distribution:

All the BELL 412EP and 412EPI operational and continued airworthiness instructions will be distributed by Bell Technical Support Services in hard copy or DVD, except engine manuals are distributed by engine manufacturer directly.

4.2 List of Operational and Continued Airworthiness Instructions

Manual	Reference No.	Description	Revision/Date
RFM	---	Rotorcraft Flight Manual(EP)	As Revised
RFM	---	Rotorcraft Flight Manual(EPI)	As Revised
MD	---	Manufacturer's Data(EP)	As Revised
MD	---	Manufacturer's Data(EPI)	As Revised
MM	---	Maintenance Manual	As Revised
IPB	---	Illustrated Parts Breakdown	As Revised
CROM	---	Component Repair and Overhaul Manual	As Revised
CROMV	---	Component Repair and Overhaul Manual Vendor Data	As Revised
ICA	---	Instructions For Continued Airworthiness For BHT 412EPI Upgrade Kit (EPI)	As Revised
II	---	Installation Instructions For 412EPI Upgrade Kit (Glass Cockpit And Engine) (EPI)	As Revised
PRC	---	PILOT REFERENCE CHECKLIST(EP)	As Revised
PRC	---	PILOT REFERENCE CHECKLIST(EPI)	As Revised
SPM	---	Standard Practices Manual	As Revised
ESPM	---	Electrical Standard Practices Manual	As Revised
SRM	---	Structural Repair Manual	As Revised
SRM	---	Structural Repair Manual for Bell Medium Series Helicopters	As Revised
S-IPB	---	Special Tools Illustrated Parts Breakdown	As Revised

Note 1: *Bell has no customized manual published currently.*

Note 2: *Bell provides temporary revisions for above manuals with E-Notification in website (www.bellhelicopter.net), and also service information including:*

ASB-Alert Service Bulletins
TB-Technical Bulletins
OSN-Operations Safety Notices
IL-Information Letters

Note 3: *For optional equipment installation, the operation document is defined in RFM supplements, and maintenance instruction is provided by its specific ICAs.*

Note 4: *Operators may get the most current status for the manuals and technical publications. from website (www.bellhelicopter.net).*

Section 5: CCARs Compliance Checklist

5.1 Statement and Explanation

This paragraph is a formal notification that CAAC AEG has developed the compliance checklists for Bell 412EP and 412EPI helicopter based on the following documents related to the aircraft configuration:

- FAA Type Certificate Data Sheet: No. H4SW, Rev 28.
- FAA STC Number SR09600RC, January 30, 2013
- Rotorcraft Flight Manual (412 EP)
- Rotorcraft Flight Manual (412 EPI)

The compliance checklists are provided as aids for inspectors and operators to identify the compliance with those specific requirements of CCARs for which the compliance has already been demonstrated in the type design. The checklists also note the requirements of CCARs which remain to be demonstrated the compliance by the operators.

When the aircraft configuration differs from the above stated aircraft configuration, it is the responsibility of the operators and their CAAC Principle Inspectors (PIs) to evaluate those differences and demonstrate or determine the compliance with the relevant requirements of CCARs.

It is also the responsibility of the operators and their PIs to evaluate the corrective actions for those items not satisfactorily demonstrating compliance in the checklist prior to an approval of conducting an appropriate operation.

5.2 CCAR-91/135 Compliance Checklist for Bell 412EP/EPI

(1) Basic Information

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
1.1 Aircraft Category	--	--	Type certified as Transport Category Helicopter Category "A" and "B"
	§135.45	N/A	--
1.2 Minimum Flight Crew	--	--	The IFR configured 412EP is certified for Category I IFR operation during day or night non-icing conditions. The minimum flight crew consists of one pilot who shall operate the helicopter from the right crew seat.
	§135.103	Complies	One pilots required for IFR operation.
1.3 Noise limitation	§91.401	TBD	Compliance to be referenced to TCDS of CAAC VTC
1.4 Fuel Venting and Exhaust Emissions	§91.401	N/A	--
1.5 Ditching	§121.157	--	--
1.6 Full scale Emergency Evacuation Demonstration	§121.161	--	--
1.7 Extended range operation with two engine airplanes (ETOPS)	§121 App H	--	--

(2) Basic Flight Operation

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
2.1 Visual Flight Rules (VFR) operation	§91.403 §135.151	Complies	VFR operation approved by type certification
2.2 Instrument Flight Rules (IFR) operation	§91.405 §91.409 §135.171	Complies	IFR operation approved by type certification
2.3 Night and over-the-top operation	§91.407 §135.167	Complies	Night VFR/IFR operation approved by type certification
2.4 Operation in icing conditions	§91.425	Not compliant	Flight in known icing conditions is prohibited.

(3) Emergency and life-saving equipment

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
3.1 Hand fire extinguishers	§91.415 §135.163	Complies	There are two hand held fire extinguishers. One fire extinguisher is located in the cockpit and one is located in the cabin
3.2 Seat and Safety belt	§91.415 §135.177	Complies	The pilot's and copilot's seats are equipped with a safety belt and also a double strap shoulder harnesses as a part of basic aircraft. Cabin passenger seat is equipped with a seat belt. All side-facing aft cabin seats have shoulder harnesses.
3.3 Sign or Instruction	§91.415 §135.183 §135.197	Complies	The passenger advisory light contains two legends: "Fasten Seat Belts" and "No Smoking" is displayed overhead in the forward area of the passenger cabin. Exit placards/markings and the method of opening emergency exits are provided as part of basic aircraft. Eight self-illuminating

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
			emergency exit lights are located in the main cabin. Chinese language placards can be provided if needed.
3.4 Spare electrical fuses or Protective fuses	§91.415	N/A	No fuses utilized
3.5 Marking of break-in points	§91.415	N/A	--
3.6 Crash axe	§91.415 §135.183	N/A	--
3.7 Portable megaphone	§91.415	N/A	--
3.8 Public address systems	§135.153	N/A	--
3.9 Crewmember interphone system	§135.153	N/A	--
3.10 Life jacket or equivalent flotation device	§91.417 §91.419 §135.175	Not Compliant	Life jackets or equivalent individual flotation devices with survivor locator light are not installed. Operator shall provide.
3.11 Equipment for making the sound signals	§91.417	N/A	--
3.12 Anchor	§91.417	N/A	--
3.13 Life raft	§91.417 §91.419 §135.175	Not Compliant	Life rafts containing lifesaving and survival equipment are not installed. Operator shall provide.
3.14 Pyrotechnic	§91.417	Not Compliant	Pyrotechnic signaling devices are not installed. Operator shall

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
signaling device	§91.421		provide.
3.15 Flotation equipment	§91.419	Optional compliance for over water operation	Emergency float kit is available as an option for operators.
3.16 Life-saving equipment (including means of sustaining life)	§91.419 §91.421	Not Compliant	Life rafts containing life sustaining equipment are not installed. Operator shall provide.
3.17 Oxygen equipment	§91.423 §135.165	Not Compliant	Operation above 3000m prohibited.
3.18 Emergency locator transmitter (ELT)	§91.435 §135.146	Optional compliance	Optionally configured with one automatic ELT
	§135.146 §135.175	Not compliant	Optionally configured with one automatic ELT. There is no non-automatically activated ELT, which may be part of life raft. Operator shall provide.
	§91.435	Optional compliance	Optionally ELT and three frequency COMPAS/SARSAT compliant.
3.19 Flashlight	§135.185	N/A	--
3.20 Lavatory fire protection	§121.308	--	--
3.21 Protective breathing equipment	§121.337	--	--

(4) Communication, Navigation and Surveillance Equipment

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
4.1 Basic radio communication and navigation equipment	§91.411	Complies	Equipped with two VHF transceivers (VHF 1 and VHF 2) Radios also offer direct 121.5 MHz tuning in an emergency.
	§91.413	Complies	Equipped with two navigation receivers (NAV 1 and NAV 2).
4.2 Radio communication and navigation equipment for CCAR-135 operation	§135.169	Complies	Equipped with two VHF transceivers (VHF 1 and VHF 2) and two navigation receivers (NAV 1 and NAV 2)
	§135.173	Optional compliance for over water operation or operation over uninhabited terrain areas	Equipped with two VHF transceivers (VHF 1 and VHF 2) and two navigation receivers (NAV 1 and NAV 2). HF communications radio kit would be installed.
4.3 Radio communication and navigation equipment for CCAR-121 operation	§121.345 §121.347	--	--
	§121.345 §121.349 §121.351	--	--
4.4 ATC transponder	§91.427	Complies	Equipped with one ATC transponder, with Mode A, C, and S capability.
	§91.427	Complies	Equipped with one ATC transponder, with Mode A, C, and S capability.
4.5 Air ground two way data link communication system	§121.346	--	--
4.6 Equipment for operations use	§121.355 §121 App. I	--	--

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
specialized means of navigation			
4.7 Altitude holding and warning system	§91.429	N/A	
4.8 Airborne thunderstorm detection equipment	§135.179	Optional Complies	An optional weather radar kit is available which satisfy the airborne thunderstorm detection.
4.9 Weather radar	§91.431 §135.181	Optional Complies	A weather radar kit is available as an option.
4.10 Terrain awareness and warning system （TAWS） Ground proximity warning / glide slope deviation alerting system	§91.437 §135.159 §135.161	N/A	Nevertheless, the aircraft configured with EGPWS.
4.11 Traffic Alert and Collision Avoidance equipment	§91.439 §135.189	N/A	--
4.12 Low altitude windshear system equipment	§121.358	--	--
4.13 Radiation indicator	§91.441	N/A	--
4.14 Required navigation performance	§91.413	N/A	
	AC-91-01R1	N/A	Nevertheless, the WAAS GPS installation in the 412EPI contained

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
	AC-91-5 AC-91-7 AC-91-8 AC-91-9 AC-91-12		within the GTN-750 complies with Enroute and Terminal RNAV and RNP requirements. WAAS augmentation is not required to achieve these performance levels.
4.15 Low visibility operation	§91.413 §91 App B AC-91-18	N/A	Nevertheless, The 412EP/EPI is approved for CAT I ILS operations only.
	AC-91-03R1 AC-91-15 AC-91-16	N/A	
4.16 ADS-B	AC-91-14	Not Compliant	ADS-B is not equipped.
4.17 SATCOM	AC-121-004R1	--	--

(5) Record Equipment

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
5.1 Flight recorder	§91.433 §135.155	Complies	Even the aircraft equipped with a single combined FDR/CVR, as already demonstrated there is no single electrical failure external to the recorder can disable both the cockpit voice recorder and the digital flight data recorder functions, CAAC consider comply with the operational requirements.
	§91.433 §135.157	Complies	Reference to above.
	§91.433	N/A for Data Link Comunication	--

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
5.2 Quick Access Recorder or equivalent equipment	§121.344	--	--

(6) Other Requirements

Item	CCAR Ref.	Compliant Status	Explanation/*Limitation*
6.1 Forward Observer's seat	§135.75	Not Compliant	No forward observer's seat equipped. The authorities have found that seating in the front row is adequate for observation in a utility configuration.
6.2 Airspeed indicator	§121.301	--	--
6.3 Altitude indicator	§121.301	--	--
6.4 Flight deck door	§121.313	--	--
6.5 Space of passenger seats	§121.213	--	--
6.6 Carriage of cargo in passenger compartments	§121.215	--	--
6.7 Carriage of cargo in cargo compartments	§121.217	--	--

Section 6: Other Evaluation Items

6.1 Forward Observer Seat

Not equipped for BELL 412EP/EPI.

6.2 Flight Crew Sleeping Quarters

Not applicable.

6.3 Electronic Flight Bag (EFB)

Not applicable.

6.4 Head-up Display and Enhanced (Flight) Vision System

Not applicable.

6.5 Emergency Evacuation Demonstration

Not applicable.

Appendix A: Point of Contact

A.1: CAAC AEG (Initial evaluation in January 2014)

Mr. Xue Shi Jun	Director, Aircraft Evaluation Division, Flight Standards Department
Mr. Tan Yun Feng	Director, Aircraft Evaluation Office, Shen Yang Aircraft Certification Center of CAAC
Mr. Li Xiao Lei	Engineer, AEG Division, Civil Aviation Safety & Technology Center

A.2: Bell (Initial evaluation in January 2014)

David Neese	Staff Engineer, Civil Certification

B.1: CAAC AEG (T5 in September 2014)

Mr. Tan Yun Feng	Director, Aircraft Evaluation Office, Shen Yang Aircraft Certification Center of CAAC
Mr. Tan Chang Jun	Vice Director, Shen Zhen Safety Surveillance and Management Bureau

B.2: Bell (T5 in September 2014)

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