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## **Flight Standardization Board (FSB) Report**

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### **Bell Helicopter Textron Canada Limited** **429** (R00003RD)

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**RECORD OF REVISIONS**

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**HIGHLIGHTS OF CHANGE**

**Revision Original:** All Sections. This is the original FSB report.

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## **1. PURPOSE AND APPLICABILITY**

1.1. This report specifies master training, checking, and currency requirements applicable to crews operating Bell Helicopter Textron Canada Limited (BHTCL) model 429 helicopters under 14 CFR part 91, 133, & 135.

The Flight Standardization Board (FSB) was convened as part the certification of the model 429 aircraft undertaken in March 2010. The FSB evaluated operating characteristics and techniques to propose training, checking, and currency requirements applicable to the model 429 helicopter. The helicopter is certificated in accordance with 14 CFR part 27, with a certificated gross takeoff weight less than 7000 pounds, and nine or less passenger seats. Statutorily, a pilot type rating is not required.

Provisions of this report are:

- Determination of Pilot Type Rating.
- Identify training, checking, and currency requirements.
- Establish Master Common Requirements for the model 429 aircraft.
- Review rotorcraft flight manual (RFM) and Checklist procedures for operational suitability.
- Describe an acceptable training program and training device characteristics.
- Identify checking and currency standards to be applied by the Federal Aviation Administration (FAA) or operators.

1.2. This report addresses the BHTCL model 429 helicopter, listed in FAA Type Certificate Data Sheet (TCDS) R00003RD. The provisions of this FSB report are effective until amended, superseded, or withdrawn by subsequent revisions to this report.

1.3. Determinations made in this report are based on the evaluations of the specific model 429 aircraft equipped in a given configuration and in accordance with current regulations and guidance. Modifications and upgrades made to the models described herein, or introduction of new related aircraft, may require amendment of the findings in this report. The FSB reserves responsibility and authority to re-evaluate and modify sections of this report based on new or revised Advisory Circular (AC) material, applicable 14 CFRs, aircraft operating experience, or the testing of new or modified aircraft under the provisions of AC 120-53, Guidance for Conduction and Use of Flight Standardization Board Evaluations, and the common procedures document for conduction of operational evaluation boards. The Joint Operational Evaluation Board (JOEB) met in Fort Worth, Texas, on March 1, through March 12, 2010. Inspectors Steven M. Sorich and Edward L. Hinch represented the FAA. Additionally, Alex Roberts of Transport Canada, Roland Bruner, and Peter Jackson of the European Aviation Safety Agency (EASA) attended the manufacturer's ground and flight training.

1.4. The guidelines in this report determine minimum requirements for approval by FAA applicable to: Operations Aviation Safety Inspectors (ASI), Principal Operations Inspectors (POI), Training Center Program Managers (TCPM), Aircrew Program Managers (APM), part 135 air carrier check airmen, instructors, airline transport pilots instructing in air transportation service, certificated flight instructors, aircrew program designees, and training center evaluators.

1.5. Terminology. The term "must" is used in this FSB report and even though it is recognized that this report provides one acceptable means, but not necessarily the only means, of compliance with part 91, 125, 133, and 135 requirements. This terminology acknowledges the need for operators to fully comply

with this FSB report, when applicable, if AC 120-53 is to be used by the operator as the means of complying with part 91, 125, 133, and 135 requirements.

1.6. This report includes:

- Minimum requirements for approval by FAA field offices,
- General advisory information which may be approved for that operator (e.g. footnotes, etc.).

1.7. Relevant acronyms, abbreviations, and publications are defined as follows:

AC	Advisory Circular
ACO	Aircraft Certification Office
ADAHRS	Air Data/Attitude & Heading Reference System
ADC	Air Data Computer
ADIU	Air Data Interface Unit
ADS	Automatic Dependent Surveillance
AEG	Aircraft Evaluation Group
AEO	All Engines Operating
AFCS	Automatic Flight Control System
AHRS	Attitude & Heading Reference System
ANP	Actual Navigation Performance
AP	Autopilot
APM	Aircrew Program Manager
AQP	Advanced Qualification Program
ATP	Airline Transport Pilot
BHTCL	Bell Helicopter Textron Canada Limited
CAS	Crew Alerting System
CHDO	Certificate Holding District Office
CHFDP	Course Heading Flight Director Panel
CFIT	Controlled Flight Into Terrain
CFR	Code of Federal Regulations
CRM	Cockpit Resource Management
DU	Display Unit
EEC/ECU	Electronic Engine Control Unit
EGPWS	Enhanced Ground Proximity Warning System
EICAS	Engine Indicating and Crew Alerting System
FAA	Federal Aviation Administration
FANS	Future Air Navigation Systems
FCC	Flight Control Computer
FMM	Fuel Management Module
FMS	Flight Management System
FSB	Flight Standardization Board
FSTD	Flight Simulation Training Device
FTD	Flight Training Device
GPS	Global Position Satellite System
HTAWS	Helicopter Terrain Awareness and Warning System
IAS	Indicated Airspeed or Integrated Avionics System
JOEB	Joint Operation Evaluation Board
LNAV	Lateral Navigation Approach Signal

MMEL	Master Minimum Equipment List
MFD	Multi-Function Display
MDR	Master Differences Requirements
OEI	One Engine Inoperative
ODR	Operator Differences Requirements
PIS	Power Indicator Section
POI	Principal Operations Inspector
PSI	Power Situation Indicator
RFM	Rotorcraft Flight Manual
RFMS	Rotorcraft Flight Manual Supplement
RNP	Required Navigational Performance
SCAS	Stability and Control Augmentation System
SIC	Second In Command
TCAD	Traffic Collision Avoidance Device
TCDS	Type Certificate Data Sheet
VFR	Visual Flight Rules
VNAV	Vertical Navigation
WAAS	Wide Area Augmentation System
8900.1	Aviation Safety Inspectors Handbook (FSIMS)
8900.2	General Aviation Airman Designee Handbook
AC120-53A	Guidance for Conducting and Use of Flight Standardization Board
CPD for OEB	Common Procedures Document for Conducting Operational Evaluation Boards

## **2. PILOT TYPE RATING REQUIREMENTS**

2.1. In accordance with the provisions of part 61, FAA Order 8900.1, Flight Standards Information Management System (FSIMS) and AC120-53, new pilot type rating is not required for the model 429 helicopter. The helicopter is certificated in accordance with part 27 with a maximum gross weight of less than 7000 pounds and nine or less passenger seats.

2.1.1. Current FAA policy for type ratings is based solely on the certified takeoff gross weight of the aircraft. There is not a type rating requirement primarily as a result of not exceeding the weight criteria of over 12,500 pounds. However system complexity and depth of pilot knowledge and understanding due to avionics and digital flight control system integration are significant. The required level of expertise (airline transport pilot) due to the complexity of flight control systems, integrated avionics, autopilot, and navigational systems in this aircraft are equivalent to that of a transport type rated aircraft.

2.1.2. The FSB has identified Level E training, checking, and currency for the model 429 aircraft. The FSB recommends implementation of a single standard for training, checking, and currency for the model 429. Regulatory changes to type rating requirements or special regulatory measures are needed for aircraft of this complexity level. Implementation of a single standard of training, checking, and currency to all model 429 operations, including part 91 operations, is necessary to achieve safety and comply with the requirements of this report. The Board determined the model 429 met AC120-53 criteria for Level E Training in a Flight Simulation Training Device (FSTD) (see Appendix 1).

2.2. Second-In-Command (SIC) Pilot Type Rating. In accordance with the provisions of §61.55, FAA Order 8900.1, and AC120-53, a SIC pilot type rating is not assigned and the designated limitation for

“SIC Privileges Only” is not specified because there is no current 14 CFR requirement for a single type rating with a takeoff gross weight of less than 12,500 pounds.

### **3. MASTER DIFFERENCE REQUIREMENTS (MDR)**

3.1. MDRs are not applicable.

### **4. ACCEPATABLE OPERATOR DIFFERENCE REQUIREMENTS (ODR) TABLES**

4.1. Reserved.

### **5. FSB SPECIFICATIONS FOR TRAINING**

5.1. Assumptions Regarding an Airmen’s Previous Experience. The provisions of this section apply to programs for airmen who have experience in part 135 operations of multi-engine, turbine powered rotorcraft equipped with integrated autopilot flight management systems, and integrated avionics and displays. For airmen not having this experience, additional requirements may be appropriate as determined by the POI, FSB, and/or AFS-200. Training must include the subjects and maneuvers listed in the areas of special emphasis of this report (see paragraph 5.5.4.) No credit is given for aircraft training received in other aircraft. All training and checking must be conducted in accordance with RFM recommended procedures and maneuvers.

5.2. Level E training is required. FSTD task credit may be given in accordance with airline transport pilot, commercial pilot helicopter, or instrument rating for helicopter as appropriate (See Appendix 1).

5.3. Second-In-Command Training Tasks. A flight crew member who serves as SIC must accomplish certain tasks, procedures or maneuvers for the SIC crew position. Training programs should address all training elements of §§61.55 and 135.345, in accordance with FAA Order 8900.1.

5.4. Future Air Navigation Systems (FANS) RNP/ANP/CNS/ADS. Flight Crews operating aircraft equipped with FANS software should receive appropriate instruction in its general operational functions, appropriate uses for areas of operation, routes, or procedures to be flown. General training should address Communications, Navigation, and Surveillance (CNS) functions covered by FANS, RNP, and ANP. In addition, sufficient training in the use of data link communication and Automatic Dependent Surveillance (ADS) to ensure adequate knowledge, skill, and proficiency for flight crews to operate the above system(s) in typical daily operations (requiring their use) should be provided.

#### **5.5. Pilots Initial, Transition and Upgrade Training**

5.5.1. Pilots Initial, Transition and Upgrade Ground Training: Initial, transition, or upgrade ground training requirements for the helicopter are found in §§91.1065, 135.345. No unique provisions or requirements are specified. Training program hours may be reduced as specified in part 135. There are no specified training program hours for transition ground training. Specific design features of the helicopter, combined with the various types of operations to be conducted, should be considered when approving helicopter transition ground training.

5.5.2. Pilots Initial, Transition, and Upgrade Flight Training: Requirements for initial, transition, or upgrade flight training for the helicopter are found in §135.347. No unique provisions or requirements are specified. Training program hours may be reduced as specified in part 135.

5.5.3 Flight Crewmember Emergency Training: Crewmember training in emergency equipment and evacuation procedures is required. Evacuation procedures training must include passenger briefing requirements to comply with RFM limitations.

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

- **Crew Alerting System (CAS).** CAS discipline and messaging function are critical because of the large amount of information available through CAS and the need of the pilot to use it without being excessively distracted.
- **CAS Messages.** CAS messages are depicted on one of two multi-function Display Units (DU's) with a third DU available as an option. Altitude and airspeed are presented on round analog instruments format. Pilots need to be able to understand the information presented on these displays. Pilots transitioning from traditional basic "T" instruments format may require additional training and instrument scan practice to gain proficiency in manually flying by reference to the DU's. Recognition of reversionary modes and display failures and appropriate corrective action to be taken must be addressed.
- **Electronic Engine Control Unit (EEC).** An operational understanding of the EEC, and its relationship to PLI, and the power limiting modes in all engines operating (AEO) and one engine inoperative (OEI) operations is required.
- **Power Situation Indicator (PSI).** PSI displays engine and transmission parameters and limitations indicating a relative scale percent of available power either as Torque (Q), Measured Gas Temperature (MGT), or Gas Turbine Speed (NG). Additionally actual Q, MGT, and NG indications are provided in digital format.
- **Power Indicator Section (PIS).** The PIS is a round analog display, and indicates in a relative scale, a percent of available power during AEO and OEI operations. The PSI cannot be used as a Q, MGT, or NG gage. The pilot must be proficient in the interpretation of this instrument.
- **Triple Tachometer Section.** Triple Tachometer Section is displayed in a bar format immediately left of the PSI. This instrument optimizes the ability to monitor the relationship of both NP indicator's to NR and the rotor governing speed. Pilots transitioning from traditional round analog triple tachometer displays may require additional training to become familiar with information presented in this new format.
- **Cyclic and Collective control grip switches.** There are ten switches on the cyclic control, and ten switches on the collective. These control multiple aircraft systems including the automatic flight control system (AFCS) Trim Release, Flight Director, Auto Pilot, and Go-Around commands. Proficiency in the use of these switches is essential.
- **Course Heading Flight Director Panel (CHDFP).** The CHDFP uses pushbuttons and knobs to select the modes of flight director engagement depicted on the pilots DU. Pilots must have an understanding of the coupled modes and system configuration as it relates to automatic flight control. This understanding is required for both normal and abnormal system operation.
- **Flight Management System (FMS) including the Autopilot (AP) and Flight Control Computer (FCC).** An understanding of the various lateral and vertical modes and the ability to select and arm the modes during different phases of flight is essential. Integrated use of the AP and FMS is critical. With any collective Flight Director (FD) mode engaged and coupled, the

AFCS provides a collective limiting function (PSI) in both AEO and OEI operations and inputs commands to keep the aircraft within Torque and MGT limits.

- **All the combinations FMS and Ground Based navigation.** All the combinations FMS and Ground Based navigation information must be understood to safely and reliably operate the aircraft during instrument approaches, including the use of vertical navigation functions.
- **Knowledge of emergency procedures for dual engine failure during cruise.** At cruise power settings, and relatively high angles of attack in the main rotor blades, a sudden loss of power in both engines can produce rapid main rotor (Nr) decay. This can result in excessive coning and subsequent loss of control. This condition is possible in all multiengine helicopters and historically has resulted in hull loss.
- **Knowledge of aircraft performance determination.** Knowledge of aircraft performance determination should be emphasized.
- **Crew Resource Management (CRM) and Controlled Flight into Terrain (CFIT) procedures.**

5.5.5. Training for Seat Dependent Tasks: RFM minimum flight crew is specified as: minimum flight crew for visual flight rules (VFR) consists one pilot. The pilot may operate the helicopter from either crew seat if dual controls and left DU are installed, otherwise pilot shall operate the helicopter from right crew seat. Single pilot instrument flight rules (IFR) shall operate from the right crew seat. Dual controls, and left DU, shall be installed for dual pilot IFR. Left crew seat may be used for an additional pilot when approved dual controls are installed.

5.5.6. SIC Crew Training: SIC crew training is accomplished as specified. Section 135.329 training programs should address tasks stipulated in FSB Specifications for Training; Areas of Emphasis (paragraph 5.5.4.).

5.2.7. Differences training as specified in the pertinent §135.321.

5.2.8. Recurrent Ground Training Fleets with Different Engine Types: Mixed-flying of helicopter fleets with different engine types (e.g. helicopter fleet with model/manufactures engines) requires additional training.

5.2.9. Training program hours for recurrent training may be reduced as specified in 14 CFR.

### 5.3. Operating Experience

5.3.1. Operating Experience Pertinent to Each Flight Crewmember: Operating experience must be obtained while serving in a primary crew position.

5.3.2. Separate Operating Experience for Single Fleet Operations: Operating experience for the helicopter will be accomplished in the model 429.

5.3.3. Operating experience for Mixed Fleet Flying Operations: Operating experience for the helicopter will be accomplished in each make/model/series helicopter.

### 5.4. Instrument Approaches

5.4.1. Operators should assure that flight crews are familiar with appropriate use of the FCC and FMS, including modes to be used, for the types of instrument approaches to be flown, when using FMS NAV mode in lieu of or in conjunction with NDB, VOR, localizer, or back course localizer procedures. This

emphasis is also appropriate for aircraft that do not have certain navigation system sensors, such as ADF, installed.

5.4.2. Sections 135.293(a)(8),(b), and 135.297, specify pilot in command (PIC) competency and instrument proficiency checking requirements. At minimum the model 429 requires a training program which addresses the following automated systems and displays:

- All primary flight and navigation instrumentation.
- FD and AP operation and status.
- Engine and rotor drive system indications.
- Electrical, hydraulic, and fuel system monitoring.
- CAS as warning, caution, advisory, and aural alerts.
- Navigation route mapping display.
- Electrical, AFCS, fuel, weight and balance information.
- Automated power assurance, Category “A” performance and hover performance information.
- Recording of exceedance and chip detection history.
- Optional WX Radar, FLIR, TCAS and TAWS inputs.

## **6. FSB SPECIFICATIONS FOR CHECKING**

6.1. Checking Items: Pertinent knowledge, procedures, and maneuvers specified by part 61, and the appropriate FAA Practical Test Standards (PTS).

6.2. Areas of Emphasis: The following areas of emphasis should be addressed during checks as necessary:

- Proficiency with manual and automatic flight must be demonstrated.
- Proper selection and use of DU/MFD displays, raw data, flight director, and Flight Guidance System modes should be demonstrated, particularly during instrument approaches.
- Demonstration of FMS navigation proficiency in approaches, departures, and arrivals.
- Proper outside visual scan without prolonged fixation on FMS operation should be demonstrated, and failure of component(s) of the FMS should be addressed.
- CRM and CFIT procedures.

6.3. All flight checks required by §135.293(b) must be accomplished in a model 429 according to instructions in the appropriate PTS, FAA-S-8081-E Instrument Rating, 8081-16A Commercial Pilot, and 8081-20 Airline Transport Pilot. Additionally information was supplemented with guidance in FAA Order 8900.1 and 8900.2.

## **7. FSB SPECIFICATIONS FOR REGENCY OF EXPERIENCE**

7.1. The FSB has found no additional “Regency of Experience” requirements for the model 429, other than those already specified in part 61 and 135. There are no variants for the model 429, therefore all checks required by part 61 or 135 must be accomplished in the specific make, model, and series aircraft.

## **8. AIRCRAFT REGULATORY COMPLIANCE CHECKLIST**

8.1. Reserved.

## **9. ADDITIONAL FSB FINDINGS AND RECOMMENDATIONS**

9.1. Instructors, Check Airman, and Examiners: For the purpose of checking, FAA ASIs, designated pilot examiners, training center evaluators, and check airmen, must be PIC qualified in the model 429. Examiners and check airmen should have 100 hours PIC in the model 429 and maintain currency in accordance with this report.

## **10. FSB SPECIFICATIONS FOR DEVICES AND SIMULATORS**

10.1. 14 CFR part 60, Flight Simulation Training Device Initial and Continuing Qualification and Use, outlines specifications for helicopter simulator and flight training devices. A full motion simulator for the model 429 does not exist. However a level 6 FSTD certificated by the NSP is used in the training program by the manufacturer who currently holds a part 141 certificate.

## **11. APPLICATION OF FSB REPORT**

11.1. All model 429 operators are subject to the provisions of this report: This report becomes effective when given final approval by the FAA. All training, checking, and currency for the model 429 aircraft, must be conducted in accordance with all provisions of this report. All training programs must incorporate the latest FAA-approved RFM procedures, RFM checklists, and the manufacturer's recommendations for training maneuvers.

## **12. ALTERNATE MEANS OF COMPLIANCE**

12.1. Alternate means of compliance to the requirements of this report must be approved by the FSB. If alternate means of compliance is sought, operators must show that the proposed alternate means provides an equivalent level of safety to the provisions of AC120-53 (as amended) and this FSB report. Analysis, demonstrations, proof of concept testing, differences documentation, or other evidence may be required.

12.2. Equivalent Level of Safety: Significant restrictions may apply in the event alternate means of compliance is sought, and the reporting requirements may be increased to ensure equivalent safety. FAA will generally not consider relief through alternate means of compliance unless sufficient lead-time has been planned by an operator to allow for any necessary testing and evaluation.

12.3. Interim Programs: In the event of clearly unforeseen circumstances, in which it is not possible for an operator to comply with provisions of this report, the operator may seek an interim program approval rather than a permanent alternate means of compliance method. Financial arrangements, scheduling adjustments, and other such reasons are not considered "unforeseen circumstances" for the purposes of this provision. Interim program approvals must be approved by the FSB Chair.

## **13. MISCELLANEOUS RECOMMENDATIONS**

13.1. The model 429 enjoys the benefit of a significant employment of integrated systems, management and presentation displays in the cockpit. Although the presentation and integration of the integrated cockpit is clean and well done, it is apparent that familiarization and expertise with the AFCS, the Garmin GNS 530 and GNS 430 avionics system is critical to safe operation of aircraft. Great improvement to situational awareness is evident in many cases, if proper use is made of the new Garmin capabilities. Improper handling of this technology can lead to unsafe situations because of the amount of information available.

13.2. An FAA requirement should be established for specific training on the model 429 for the Integrated Avionics Subsystem for this aircraft. Not because it is so complex, but rather that mismanagement could have unsafe consequences. This carries with it responsibility to assign quality

familiarization with its use. Any Initial checkout, transition, and recurrent course training, must then cover this training component at an absolute minimum.

13.3. Options Pending Approval: Additional options and capability are emerging: Search and Rescue software, associated Mark on Target, and Hover Hold with fully coupled navigational capability. Additionally, approval of electronic, normal and emergency checklists are pending and a retractable wheeled landing gear configuration is under development.

**APPENDIX 1  
 Flight Training PIC/SIC Flight Training BHTCL Model 429 Helicopter  
 Maneuvers and Procedures Tables**

The events which must be accomplished during flight training are listed in the maneuvers and procedures tables in this section. These tables also contain the acceptable flight training equipment (training devices, simulators, or aircraft) which may be used for any training event. An “X” indicates that the specified FSTD or SIM has been qualified for that event without further consideration or approval. An “A” indicates that a lower level device or simulator may be used for procedural training if that device has the necessary systems representations and functions for training on the event. These systems representations and functions exceed the basic requirements for that level device or simulator; therefore, an “A” indicates that the device or simulator must be evaluated and approved for each particular event. Any maneuver or procedure permitted in a specific level of FTD or SIM may also be conducted in a higher level of FTD, SIM, or the aircraft itself (provided the event can safely be accomplished in the aircraft). Certain training events within the tables are preceded with a box ([ ]). If the operator is authorized (or required) to conduct these maneuvers by Operations Specifications (OpSpecs) (for example, a circling approach), a POI should check the appropriate box to indicate these events must be included in the training curriculum. Certain optional training events indicated by a pound sign (#) in the maneuvers and procedures tables are not specifically required by the regulations or OpSpecs. Many of these optional training events, however, are often included in an operator’s flight training curriculum and should be conducted in a properly qualified device or simulator. FAA policy requires detailed descriptions (or pictorial displays) of the training events marked with the letter (M) (see FAA Order 8900.1, Volume 3, Chapter. 19, Section 6, paragraph 3-1233).

FLIGHT PHASE	TRAINING EVENT	REMARK	FTD LEVEL				SIM LEVEL			A C F T
			4	5	6	7	B	C	D	
PREPARATION	Visual Inspection		-	-	-	-	-	-	-	X
	Before Taxi Procedures		A	A	X					X
	Performance Limitations		A	A	X					X
SURFACE OPERATION	Starting		A	A	X					X
	Rotor Engagement				X					X
	Rotor Engagement on Water SEA	Not Used	-	-	-	-	-	-	-	-
	Taxiing				-					X
	Water Taxiing SEA	Not Used	-	-	-	-	-	-	-	-
	Lift-to-Hover IGE/OGE (M)				-					X
	Hover Turns IGE/OGE				-					X
	Sideward/Rearward Hovering				-					X
	Slope Operations				-					X
	Liftoff				X					X
Taxiing				-					X	

FLIGHT PHASE	TRAINING EVENT	REMARK	FTD LEVEL				SIM LEVEL			A C F T
			4	5	6	7	B	C	D	
TAKEOFF	Normal (M)				X					X
	Instrument				X					X
	Obstacle Clearance				X					X
	Running (High Altitude)	Not Used	-	-	-	-	-	-	-	-
	Category "A" (M)				-					X
	Category "A" (M) With Powerplant Failure Before CDP				-					X
	Category "A" (M) With Powerplant Failure After CDP				-					X
	CLIMB	Rejected Takeoff (M)				X				
CLIMB	Normal				X					X
	Best Rate				X					X
	Best Angle				X					X
EN ROUTE	Medium-Banked Turns				X					X
	Powerplant Shutdown and Restart				X					X
	Low Speed Characteristics				-					X
	High Speed Handling Characteristics				-					X
DESCENT	Normal				X					X
	Maximum Rate				X					X
	Autorotative Glide				X					X

FLIGHT PHASE	TRAINING EVENT	REMARK	FTD LEVEL				SIM LEVEL			A C F T
			4	5	6	7	B	C	D	
APPROACHES	VFR Procedures Normal (M)				-					X
	Obstacle Clearance				-					X
	High Altitude				-					X
	Elevated Landing Site				-					X
	With Degraded Control Augmentation				X					X
	Balked Landing (M)				X					X
	IFR Precision Approaches (M)				X					X
	ILS/Normal									
	ILS/One-Engine Inoperative				X					X
	[ ] MLS/Normal				-					X
	[ ] MLS/One-Engine Inoperative				-					X
	[ ] PAR/Normal				-					X
	[ ] PAR/One-Engine Inoperative #				-					X
	IFR Non-precision Approaches (M)				X					X
	NDB/Normal									
	VOR/Normal				X					X
	[ ] LOC Backcourse Procedures				X					X
	[ ] SDF/LDA Procedures				-					X
	[ ] ASR Procedures				-					X
	[ ] RNAV Procedures				X					X
	[ ] LORAN C Procedures				-					X
	[ ] Circling Approach (M) (Simulator must be qualified for training/checking on the circling maneuver)				-					X
	Missing Approaches (M) From Precision Approach				X					X
From Non-precision Approach				X					X	
NOTE: At least one MAP must be a complete approved procedure.			-	-	-	-	-	-	-	
With Powerplant Failure				X					X	

FLIGHT PHASE	TRAINING EVENT	REMARK	FTD LEVEL				SIM LEVEL			A C F T
			4	5	6	7	B	C	D	
LANDINGS	Normal				X					X
	Normal-to-the-water SEA	Not Used	-	-	-	-	-	-	-	-
	[ ] Category "A"				-					X
	[ ] Category "A" With Powerplant Failure after LDP				-					X
	Crosswind				-					X
	From Precision Instrument Approach				X					X
	From a Precision Approach With at Least 50 percent Power Deficiency				X					X
	With Degraded Control Arguments				X					X
AFTER LANDING	Taxi				-					X
	Parking #				X					X
	Stopping the Rotors				X					X
	Emergency Evacuation #				X					X
UNPREPARED SITE OPERATIONS	Confined Areas				-					X
	Pinnacles				-					X
	Ridgelines				-					X
	Water Sites SEA	Not Used	-	-	-	-	-	-	-	-
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding				X					X
	Ice Accumulation on Airframe #				-					X
	Air Hazard Avoidance #				-					X
	Windshear/Microburst #	Not Used	-	-	-	-	-	-	-	-

**APPENDIX 2**  
**Master Difference Requirements (MDR) Table**

Reserved.

**APPENDIX 3**  
**Operator Difference Requirements (ODR)**

Reserved.

## **APPENDIX 4**

### **Sample Training Program BHTCL Model 429**

#### **CURRICULUM SEGMENT OUTLINE**

As part of an approved training program, an operator may use many methods when conducting helicopter ground training, including classroom instruction, pictures, videotape, ground-training devices, computer-based instruction, and static helicopter training.

The ground training curriculum segment outline is comprised of the following subject areas: General Operational Subjects, Aircraft Systems, and Systems Integration.

#### **General Operational Subjects**

The portion of ground training referred to as "General Operational Subjects" includes instruction in:

- A. Weight and Balance
- B. Performance
- C. Flight Planning
- D. Approved Rotorcraft Flight Manual/Rotorcraft Operating Manual (As Appropriate)
- E. Crew Resource Management (CRM)

#### **Aircraft Systems**

The training modules presented in the aircraft systems subject area consists of a breakdown of the various systems of the model 429. These modules may be taught in any sequence, however all modules must be covered.

- A. Aircraft General
- B. Lighting
- C. Master Warning System/Caution Advisory Module
- D. Electrical
- E. Fuel
- F. Powerplant
- G. Ice and Rain Protection
- H. Fire Protection
- I. Powertrain
- J. Main Rotor
- K. Active Vibration Control System
- L. Tail Rotor
- M. Hydraulics
- N. Landing Gear
- O. Flight Controls
- P. Automatic Flight Control System (AFCS)
- Q. Environmental Health Usage Monitoring System (HUMS)
- R. Kits and Accessories
- S. System Review, Examination, and Critique

#### **TRAINING MODULE OUTLINES**

## **General Operational Subjects Modules**

- A. Weight and Balance Module
  - 1. General Principles and Methods of Weight and Balance Determination
  - 2. Operations
  - 3. Limitations
- B. Performance Module
  - 1. Use of Charts, Tables, Tabulated Data, and Other Related Material
  - 2. Performance Problems, Normal, Abnormal, and Emergency Conditions
  - 3. Performance Limiting Factors such as Ambient Temperature, Density Altitude etc.
- C. Flight Planning Module
  - 1. Flight Planning Charts, Such as Fuel Consumption Charts
  - 2. Operations
  - 3. Limitations
- D. Approved Rotorcraft Flight Manual Module
  - 1. Applicability and Description of the RFM
  - 2. Normal, Abnormal, and Emergency Procedures Sections
  - 3. Limitations Section
  - 4. Maneuvers and Procedures Section
  - 5. General Performance Section
  - 6. Systems Description
  - 7. Appendices, Bulletins, and Supplements
- E. Crew Resource Management (CRM) Module
  - 1. Situational Awareness and the Error Chain
  - 2. Stress
  - 3. Communications
  - 4. Synergy and Crew Concept
  - 5. Workload Management
  - 6. Decision Making
  - 7. Advanced/Automated Cockpit)

## **Systems Modules**

- A. Aircraft General Module
  - 1. General
    - a. Aircraft Contents of RFM
    - b. Training Manuals
    - c. Equipment and Furnishings
    - d. Emergency Equipment
  - 2. Structures
  - 3. Operating Limitations
  - 4. Instrument Markings
    - a. Engines
    - b. Miscellaneous Cockpit Instruments
  - 5. Aircraft Walk Around

- a. Use Appropriate Visual, ACPS or Available Aircraft
  
- B. Lighting Module
  1. General
  2. Operations
  3. Limitations
  4. Abnormal and Emergency Procedure
  
- C. Master Warning/Caution Advisory System Module
  1. General
  2. Operations
  3. Limitations
  4. Abnormal and Emergency Procedures
  
- D. Electrical Module
  1. General
    - a. System Description
    - b. DC Power
    - c. Annunciators
  2. Operations
  3. Limitations
  4. Abnormal and Emergency Procedures
  
- E. Powerplant Module
  1. General
    - a. System Description
    - b. Controls and Components
    - c. Indicators/Indications
    - d. Annunciators
  2. Operations
  3. Limitations
  4. Abnormal and Emergency Procedures
  
- F. Ice and Rain Protection Module
  1. General
  2. Operations
  3. Limitations
  4. Abnormal and Emergency Procedures
  
- G. Fire Protection Module
  1. Engine Fire Detection
    - a. General
    - b. Operations
  2. Engine Fire Extinguishing

- a. General
  - b. Operations
  - c. Limitations
  - d. Abnormal and Emergency Operations
3. Portable Fire Extinguisher
    - a. Location
    - b. Preflight

#### H. Powertrain Module

1. General
  - a. System Description
  - b. Controls and Components
  - c. Annunciators
2. Operations
3. Limitations
4. Abnormal and Emergency Procedures

#### I. Main Rotor Module

1. General
  - a. System Description
  - b. Controls and Components
2. Operations
3. Limitations
4. Abnormal and Emergency Procedures

#### J. Active Vibration Control (AVC) System

1. General
  - a. System Description
  - b. Controls and Components
2. Operations
3. Limitations
4. Abnormal and Emergency Procedures

#### K. Tail Rotor Module

1. General
  - a. System Description
  - b. Controls and Components
2. Operations
3. Limitations
4. Abnormal and Emergency Procedures

#### L. Hydraulics Module

1. General
2. Operations
3. Limitations
4. Abnormal and Emergency Procedures

M. Landing Gear

1. General
  - a. Landing Gear
  - b. Servicing
2. Operations
3. Limitations
4. Abnormal and Emergency Procedures

N. Flight Controls Module

1. General
  - a. System Description
  - b. Controls and Components
  - c. Indicators/Indications
  - d. Annunciators
2. Operations
3. Limitations
4. Abnormal and Emergency Procedures

O. Automatic Flight Control System (AFCS) Module

1. General
  - a. System Description
  - b. Controls and Components
  - c. Annunciators
  - d. Servicing
2. Operations
3. Limitations
4. Abnormal and Emergency Procedures

P. Avionics Module

1. Garmin GNS 430/GNS 530
2. Display Units (DU)
3. Integrated Avionics System (IAS)
4. General
  - a. System Description
  - b. Controls and Components
  - c. Annunciators
  - d. Servicing
5. Operations
6. Limitations
7. Abnormal and Emergency Procedures

Q. Environmental Module

1. General
  - a. System Description
  - b. Controls and Components

- c. Annunciators
  - d. Servicing
  - 2. Operations
  - 3. Limitations
  - 4. Abnormal and Emergency Procedures
- R. Health Usage Monitoring System
- 1. General
  - 2. Operations
  - 3. Limitations
  - 4. Abnormal and Emergency Procedures
- S. Kits and Accessories Module (Floats/Rescue Hoist/Cargo Hook - as equipped)
- 1. General
    - a. System Description
    - b. Controls and Components
    - c. Annunciators
    - d. Servicing
  - 2. Operations
  - 3. Limitations
  - 4. Abnormal and Emergency Procedures
- T. Systems Review, Examination and Critique Module
- 1. Written Examination

## **Model 429 GROUND & FLIGHT PROCEDURES**

### **TRAINING SYLLABUS OUTLINE**

#### **Course Content:**

Classroom and/or FTD presentations will cover the cockpit controls and instrumentation, airframe, powerplant, and all aircraft systems. In addition, normal procedures, emergency procedures, operating limitations and performance will be studied. The flight procedures training includes complete familiarization with the model 429 helicopter, instruction in multi-turbine engine operation, flight instruction in normal flight maneuvers and emergency procedures. Simulated emergency procedures will include OEI operations, ECU failures, hydraulic system malfunctions, engine fire and electrical failures. Tail rotor malfunctions will be discussed.

#### **Completion Standards:**

The pilot will demonstrate through oral, written and dual flight instruction that the minimum skills, knowledge and experience necessary to operate at the appropriate certificate level are met.

#### **Special Training Resources:**

Oral instruction may be supplemented by the use of films, slides, video tapes and printed handouts. Training may be supplemented by the use of the model 429 FTD.

**Safety Procedures:** All dual flights will be conducted strictly in accordance with the Code of Federal Regulations and standard Rotorcraft Flight Manual procedures.

## **COURSE OBJECTIVES**

**GROUND TRAINING:** Successful completion of the course will enable a qualified helicopter pilot to transition to the model 429 helicopter with a comprehensive knowledge of aircraft systems and components and a thorough understanding of operational characteristics and flight limitations.

**FLIGHT TRAINING DEVICE:** To provide the student an opportunity to practice cockpit procedures, normal, and emergency procedures, and discuss cause and response to caution, warning, and abnormal indications.

**FLIGHT:** To insure complete knowledge of the current model 429 RFM, to demonstrate and practice normal flight maneuvers and to establish proficiency and safety in all phases of flight.

**VFR SYLLABUS**

**COURSE: 429 PILOT GROUND AND FLIGHT PROCEDURES TRANSITION TRAINING**

<b><u>TOPIC</u></b>	<b><u>SUBJECT</u></b>	<b><u>HOURS</u></b>		
		<b><u>GRD</u></b>	<b><u>FTD</u></b>	<b><u>FLT</u></b>
1	Enrollment / Safety Brief / Introduction	2.0		
2	Crew Compartment	1.0		
3	Limitations	1.0		
4	Integrated Avionics System	2.0		
5	Airframe	1.0		
6	Electrical System	1.0		
7	Fuel System	1.0		
8	Power Plant (PW-207D1/D2)	2.0		
9	Drivetrain and Rotors	1.0		
10	Flight Controls/Hydraulics System	1.0		
11	Automatic Flight Control System	2.0		
12	Performance	1.0		
13	Weight and Balance	1.0		
14	Pre-Flight Procedures	1.0		
	Examination	<u>2.0</u>		
Sub Totals		<u>20</u>	3-4	4-5
Total			28	

**IFR SYLLABUS**

**COURSE: 429 PILOT IFR GROUND AND FLIGHT PROCEDURES TRAINING**

<b><u>TOPIC</u></b>	<b><u>SUBJECT</u></b>	<b><u>HOURS</u></b>		
		<b><u>GRD</u></b>	<b><u>FTD</u></b>	<b><u>FLT</u></b>
1	IFR Procedures	1.0		
2	AFCS and 429 Instrument usage	1.0		
3	IFR Garmin usage	2.0		
	Sub Totals	4.0	2	2-3
	Total		8.0	

## **KNOWLEDGE LEVEL:**

Students will be trained to one of four general levels of knowledge relative to the importance of the topic and objectives of this course.

F = Familiarization: This standard is used in conjunction with information designed to increase background information or general knowledge. This level is usually confined to the general description and purpose of the various systems and components.

P = Pilot: This standard denotes a level of knowledge and skill required by a pilot to perform a comprehensive preflight inspection, safely execute all basic helicopter maneuvers and the ability to perform all required in-flight malfunction procedures. The pilot will fully understand the normal operation of the helicopter systems, their operating limitations, identification of abnormal conditions and the corrective action to be taken.

C = Operational Check Flight: This standard includes the Pilot level of training and additionally reflects the abilities, knowledge and skills necessary to identify, isolate and troubleshoot all systems malfunctions or abnormal flight characteristics. The functional check flight pilot will have the knowledge and ability to perform all functional check flight procedures and operational/performance checks to confirm the airworthiness of the helicopter.

I = Instructor: This standard of knowledge and skill reflects the ability to instruct ground subjects and flight techniques to the pilot level (this does not include teaching techniques or professional instructor skills).

**PRESENTATION:** The method by which tasks and examinations are presented and/or measured will utilize one of the following codes:

**C/D = CBT/Demonstration** is used when interactive multimedia courseware is available for a course. The CBT can supplement or replace portions of the classroom presentations. The instructor must be present/available in the multimedia setting. When applicable, includes use of components in the classroom and/or shop and also permits visits to the helicopter/tilt rotor aircraft when required to present a more meaningful presentation.

**L/D = Lecture/Demonstration** is primarily classroom presentation, but should be understood to include the use of components in the classroom and/or shop, and also permit visits to the helicopter when required to present a more meaningful presentation.

**A/T = Aircraft/Trainer** is primarily material presentation to be accomplished on the actual helicopter/tilt rotor aircraft, FTD or maintenance trainer.

**JT = Hands-on Training** denotes actual performance of the job by the trainee, either on the helicopter itself or FTD.

**OB = Open Book** is used to indicate that the exam is an open book examination.

**PE = Practical Examination** is used to indicate that the examination entails satisfactory completion of a practical exercise.

**FC = Flight Check** is used to indicate when a task requires satisfactory completion of a flight check ride.

<u>APPROX HOURS</u>	<u>TOPIC</u>	<u>LEVEL</u>	<u>TYPE PRESENTATION</u>	<u>CONTENT</u>
2.0	Enrollment/Safety Brief/Introduction	F	L/D	Enrollment and introduction to the model 429 helicopter. General overview of the performance, characteristics, and capabilities of the 429, associated publications, safety practices, and CRM.
1.0	Crew Compartment	P	L/D	General overview and discussion of cockpit configurations, furnishings, systems and associated controls, and instrumentation. Brief introduction to the IAS.
1.0	Limitations	P	L/D	Discussion focusing on helicopter and systems operating limitations/restrictions.

<u>APPROX HOURS</u>	<u>TOPIC</u>	<u>LEVEL</u>	<u>TYPE PRESENTATION</u>	<u>CONTENT</u>
2.0	Integrated Avionics System	P	L/D A/T	Discussion of functions and features of the IAS, to include set-up and operation. Discussion of symbology, color codes, and various displays and accessibility. Discussion of the CAS messages and other features.
1.0	Airframe	F	L/D	General overview of the 429 basic structure, access panels/doors, and furnishings.
1.0	Electrical System	P	L/D	Discussion of the DC electrical systems (external power, battery, generator) and power distribution/control. Discussion of power application, engine start, and normal and emergency operations. Review of electrical information displays.
1.0	Fuel System	P	L/D A/T	Discussion of the fuel system to include capacities, components, fuel specifications, system operations (normal/abnormal), and associated controls and displays.
2.0	Powerplant	P	L/D A/T	Discussion focusing on principles of operation, components, oil system, pilot controls and displays, OEI operation, and fire detection/suppression systems.
1.0	Drivetrain and Rotors	P	L/D A/T	Discussion focusing on the main driveshafts, transmission and mast assemblies, main rotor, tail rotor driveshaft and rotor assemblies, and rotor blades, to include design and construction.
1.0	Flight Controls / Hydraulics	P	L/D A/T	Discussion focusing on the flight control system, its components, operation, and pilot controls (cyclic, collective, and anti-torque/directional). Discussion of the hydraulic system components, operation, controls, and displays.
2.0	Automatic Flight Control System	P	L/D A/T	Discussion focusing on system components, controls, modes of operation, and indications, including interface with the IAS.

<u>APPROX HOURS</u>	<u>TOPIC</u>	<u>LEVEL</u>	<u>TYPE PRESENTATION</u>	<u>CONTENT</u>
1.0	Performance	P	L/D	Using flight manual performance charts including engine power check, rate of climb, hover ceiling, critical wind azimuth, and height-velocity diagram to determine performance characteristics, capabilities, and operating restrictions.
1.0	Weight and Balance	P	L/D	Utilization of weight and balance data for gross weight, longitudinal and lateral center of gravity determination, and load distribution.
1.0	Pre-Flight Procedures	P	L/D A/T	Overview and accomplishment of Pre-flight inspection requirements in accordance with the flight manual.
2.0	Examination	P	OB	Completion of a multiple choice examination to specified standards and review results after grading. Discuss, as necessary, to clarify.
20 Hours	Course Total			

<u>APPROX HOURS</u>	<u>TOPIC</u>	<u>LEVEL</u>	<u>TYPE PRESENTATION</u>	<u>CONTENT</u>
1.0	IFR Procedures	P	L/D A/T	Review of IFR procedures and requirements in the FAR system.
1.0	Automatic Flight Control System and 429 Instrument Procedures	P	L/D A/T	Discussion focusing on system components, controls, modes of operation, and indications, including interface with the IAS as it relates to instrument flight.
2.0	IFR Garmin Usage	P	L/D A/T	Discussion focusing on system components, controls, modes of operation, and indications, including interface with the 429 Instrument systems.
4.0 Hours	Course Total			

**FLIGHT TRAINING DEVICE**

**VFR TRANSITION FTD TRAINING**

**FTD Period One** – 1.0 hour flight. 30-60 minutes ground briefing.

**Objectives:** Introduce customer pilot to the model 429 aircraft, checklist, systems, and normal procedures.

**CONTENT:**

- 1 Normal Start and Shutdown Checklist/Procedures
- 2 Systems testing
  - Hydraulics
  - Auto Pilot
- 3 General familiarity with DUs, IAS, and menus
  - Setting-Altimeter, Decision height, Altitude Preselect
  - Systems Schematics
  - Maintenance Menu pages
  - Composite, map and arc presentations
- 4 Hot Start Shutdown

**Completion Standard:** The student will be introduced to aircraft systems and use of check lists. They will show improvement in understanding of systems.

**FTD Period Two**—1.0 hours flight. 30-60 minutes ground briefing.

**Objectives:** Introduce customer pilot to systems use, normal and emergency procedures.

**CONTENT:**

- 1 Normal Start and Shutdown Checklist/Procedures
- 2 Start in the “Fly” position
- 3 Normal Flight Procedures
- 4 Use of GPS/Garmin
- 5 Systems Discussion/Malfunctions using schematics page and CAS messages
  - Electrical
  - Fuel
  - AFCS
- 6 Emergency Procedures/CAS messages

**Completion Standard:** The student will be introduced to aircraft systems and normal procedures. They will show improvement in understanding of systems.

**FTD Period Three**—1.0 hour flight. 30-60 minutes ground briefing.

**Objectives:** Introduce customer pilot to systems use, normal and emergency procedures.

CONTENT:

- 1 Normal Start and Shutdown Checklist/Procedures
- 2 Manual throttle procedures
- 3 Power Assurance Check
- 4 OEI Training Switch
- 5 OEI Operations
- 6 Autopilot use/familiarity
- 7 Execute an instrument approach

**Completion Standard:** The student will show familiarity with aircraft systems and normal procedures.

**FTD Period Four (Optional-based on performance)**

#### IFR TRANSITION FTD TRAINING

**FTD Period Five**—1.0 hours flight. 30-60 minutes ground briefing.

**Objectives:** Introduce customer pilot to auto pilot systems use and instrument procedures.

CONTENT:

- 1 GPS Flight Plan programming
- 2 GPS activation of instrument approach procedure
- 3 Cross county flight with at least:
  - 1 GPS approach
  - 1 VOR approach
  - 1 ILS approach

**Completion Standard:** The student will use the autopilot system to safely conduct IFR procedures.

**FTD Period Six**—1.0 hours flight. 30-60 minutes ground briefing.

**Objectives:** Introduce customer pilot to auto pilot systems use and instrument procedures.

CONTENT:

- 1 GPS Flight Plan programming
- 2 GPS activation of instrument approach procedure
- 3 Cross county flight with at least:
  - 1 GPS approach
  - 1 VOR approach
  - 1 ILS approach
- 4 Auto Pilot malfunctions
- 5 Approach procedures without the use of Auto Pilot
- 6 DU malfunctions
- 7 Failure of instruments required for IFR flight
- 8 Inadvertent IMC

**Completion Standard:** The student will use the autopilot system to safely conduct IFR procedures.

## **VFR TRANSITION FLIGHT TRAINING**

**Flight Period One** – 1.0-1.5 hour dual flight instruction. 30 minutes ground briefing.

**Objectives:** Introduce customer pilot to the Bell 429 aircraft, checklist, systems, and normal procedures.

### **CONTENT:**

- 1 Pre-Flight Inspection
- 2 Cockpit Inspection/IAS Familiarization
- 3 Pre-Start Procedures
- 4 Engine Starting Procedures
- 5 Systems Checks
- 6 Power Assurance Check
- 7 Hovering Maneuvers (with and without APs)
  - (a) Take-Off To a Hover
  - (b) Landing From a Hover
  - (c) Hovering Turns
- 8 Normal Flight Maneuvers
  - (a) Normal Take-Off
  - (b) Normal Approach
  - (c) Maximum Performance Take-Off
  - (d) Steep Approach
  - (e) Shallow Approach
  - (f) Running Landing
- 9 Power Assurance Check

**Completion Standards:** Customer pilot should gain familiarization with the aircraft, checklist, systems, and normal procedures.

**Flight Period Two** – 1.0-1.5 hour dual flight instruction. 30 minutes ground briefing.

**Objectives:** Review and practice procedures and maneuvers from Flight Period #1. Introduce Emergency Procedures including hydraulic system malfunctions, and OEI training.

CONTENT:

**Review:**

- 1 Normal Flight Maneuvers—all previously introduced maneuvers

**Introduce:**

- 2 Emergency Procedures
  - OEI profile-approach and landing
  - Autorotations entries-straight-in and 180 turns
- 3 Slope Landings
- 4 Platform Landings (if available)
- 5 Confined Area Landings (if available)

**Completion Standards:** Customer should demonstrate increased knowledge of checklist procedures and proficiency in normal maneuvers.

**Flight Period Three** – 1.0-1.5 hour dual flight instruction. 30 minutes ground briefing.

**Objectives:** Review and practice maneuvers and procedures from previous flight periods. Introduce Procedures for ECU system malfunctions.

CONTENT:

**Review:**

- 1 Normal Flight Maneuvers—all previously introduced maneuvers
- 2 Emergency Procedures—all previously introduced maneuvers

**Introduce:**

- 3 ECU system malfunctions.
- 4 DU malfunctions
- 5 Use of Coupled Auto Pilot functions

**Completion Standards:** Customer pilot should demonstrate increased understanding of aircraft systems and improvement in ability to execute normal maneuvers and emergency procedures.

**Flight Period Four** – 1.0-1.5 hour of dual Flight Instruction. 30 minutes ground briefing.

**Objectives:** Review and practice maneuvers and procedures from previous flight periods. Introduce procedures for engine fire terminating with OEI landing, power recovery autorotations, (straight-in and 180°) and optional maneuvers.

CONTENT:

**Review:**

All previously introduced maneuvers, systems, and malfunctions.

**Introduce:**

Instrument Approach Procedures

**Completion Standards:** Customer pilot should demonstrate increased understanding of aircraft systems and improvement in ability to execute normal maneuvers and emergency procedures

## **IFR TRANSITION FLIGHT TRAINING**

**Flight Period Five** – 1.5 hours of dual Flight Instruction. 30 minutes ground briefing.

**Objectives:** Introduction of Instrument Flight and Approach Procedures.

**CONTENT:**

**Review:**

Normal procedures

**Introduce:**

- 1 Instrument Approach Procedures
  - GPS Approach
  - VOR Approach
  - ILS Approach
- 2 Use of Auto Pilot functions during instrument procedures
- 3 Programming Garmin 430/530 for instrument flight

**Completion Standards:** Customer pilot should demonstrate increased understanding of aircraft systems and improvement in ability to execute normal maneuvers and emergency procedures.

**Flight Period Six**– 1.5 hours of dual Flight Instruction. 30 minutes ground briefing.

**Objectives:** Review and practice instrument approach procedures and introduce Auto Pilot malfunctions.

CONTENT:

**Review:**

- 1 Instrument Approach Procedures
  - GPS Approach
  - VOR Approach
  - ILS Approach
- 2 Use of Auto Pilot functions during instrument procedures
- 3 Programming Garmin 430/530 for instrument flight

**Introduce:**

- 1 Auto Pilot uncoupling
- 2 Failure of DU
- 3 Failure of instruments required for IFR flight
- 4 Cross Country IFR flight
- 5 Inadvertent flight into IMC

**Completion Standards:** Customer pilot should demonstrate improvement in all practiced maneuvers. Flight training will be complete when the pilot demonstrates the ability to perform IFR flight with the appropriate degree of proficiency for his/her experience level.

APPENDIX 5  
Aircraft Regulatory Compliance Checklist

**AIRCRAFT REGULATORY COMPLIANCE CHECKLIST**

**Manufacturer Instructions for filling out Compliance Checklist.**

The compliance checklist documents applicable part 91 and 135 regulatory requirements to assist the FAA ASIs in the expedited approval of that aircraft for a proposed operation. This list pertains specifically to a representative production aircraft, and not an aircraft that might be used during FSB or other certification activities.

**COLUMN DEFINITIONS:**

**14 CFR Section** - defines the specific regulatory section that is to be considered.

**Title** - represents the approximate title of the specific regulation cited in 14 CFR.

**Compliance** - the only annotation choices for this column include the following:

- a. *Compliant* (means the aircraft complies fully with this regulatory requirement.)
- b. *Not Compliant* (means the aircraft does not comply with the regulatory requirement. A comment must be included.)
- c. *Optionally Compliant* (means the equipment is optional and is not part of required equipment. A comment should be included.)
- d. *Not Applicable* (means the regulatory requirement does not pertain to the aircraft.)
- e. *Operator Responsibility* (means that compliance with the regulation is exclusively Operator's responsibility; the manufacture must verify.)

**Remark** - is used to explain the response in the Compliance Column, if warranted; otherwise it may be left blank.

**FSB Finding** - is left blank; it is for FSB use only.

**APPENDIX 5**  
**AIRCRAFT REGULATORY COMPLIANCE CHECKLIST**

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
91.9(a)	Compliance with Flight Manual, Markings, and Placard Markings	Operator Responsibility	The helicopter meets §§ 27.1503 through 27.1525 and 27.1541 through 27.1589 for Approved RFM.	Concur
91.9(b)(1)	Availability of Current Rotorcraft Flight Manual in Aircraft	Operator Responsibility	The helicopter meets the § 27.1581. A current, approved RFM and revisions of RFM are distributed to the operator.	Concur
91.9(c)	Identification of Aircraft in Accordance with part 45	Operator Responsibility	The helicopter is identified in accordance with part 45.	Concur
91.103(a)	IFR Flight Planning and Fuel Requirements	Operator Responsibility	Helicopter fuel consumption and speed / range information is contained in Section 4 of the RFM.	Concur
91.103(b)(1)	Preflight Planning Runway Performance Data	Operator Responsibility	Flight planning data for category A performance contained in RFM Supplement Number 1, Appendix A.	Concur
91.203 (a)(b)	Valid Airworthiness Certificate, Flight Permit, Registration Certificate.	Operator Responsibility	Manufacturer has no remarks.	Concur
91.203(c)	Fuel Tanks in the Passenger/Baggage Compartment	Operator Responsibility	Auxiliary Fuel Tank in Baggage compartment certified IAW part 27 and 43.	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
91.203(d)	Fuel Venting and Exhaust Emissions Requirements	The aircraft meets part 34 as amended IAW the certification basis of the aircraft	Helicopter is certified IAW part 27 and 34.	Concur
91.205(a)	Powered Civil Aircraft with Standard Category U.S. Airworthiness Certificates: Instrument and Equipment Requirements: General	Operator Responsibility	The helicopter may operate in any operation described § 91.205 (b) through (f). RFM Section 1, Limitations, Operations Authorized	Concur
91.205(b)	Day VFR	Complies	The helicopter may operate in any operation described in § 91.205 (b) through (f). RFM Section 1, Limitations, Operations Authorized	Concur
91.205(c)	Night VFR	Complies	The helicopter may operate in any operation described in § 91.205 (b) through (f). RFM Section 1, Limitations, Operations Authorized	Concur
91.205(d)	IFR	Complies	The helicopter may operate in any operation described in § 91.205 (b) through (f). RFM Section 1, Limitations, Operations Authorized	Concur
91.205(h)	Night Vision Goggle Operations	Installation Variable	STC available as optional installation.	Night Vision Device compatibility not evaluated by FSB.
91.209(b)	Operate an aircraft equipped with an anti-collision light system.	Operator Responsibility	Aircraft is equipped with anti-collision light in compliance with 14 CFR.	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
91.211 (a)	Supplemental Oxygen: General	Operator Responsibility	Not Applicable	Concur
91.213	Inoperative Instruments and Equipment	Operator Responsibility	An FAA approved MMEL is available on the internet from the FAA FSIMS.	Concur
91.215 (a)	ATC Transponder and Altitude Reporting Equipment and Use	Operator Responsibility	Current production aircraft are equipped with Enhanced Mode S Transponders	Concur
91.215 (b),(c)(d)	Transponder Operation	Operator Responsibility	Current production aircraft are equipped with Enhanced Mode S Transponders	Concur
91.217 (a)(1)	Deactivation of equipment.	Operator Responsibility	An FAA approved MMEL is available on the internet from the FAA FSIMS.	Concur
91.217 (a)(2)	Tests and calibration.	Operator Responsibility	Complies with 14 CFR	Concur
91.217 (a)(3)	Altimeters and digitizers standards.	Operator Responsibility	Complies with 14 CFR	Concur
91.217 (b)	Same Source	Operator Responsibility	Complies with 14 CFR	Concur
91.221 (a)(b)	Traffic Alert and Collision Avoidance System Equipment and Use	Operator Responsibility	Complies with 14 CFR	Concur
91.225 (a)	Automatic Dependent Surveillance-Broadcast Out Equipment	Not Installed	Not Applicable	Concur
91.227 (b)	1090 MHz ES and UAT Broadcast Links and Power Requirements	Not Installed	Not Applicable	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
91.227 (c)	ADS-B Out Performance Requirements	Not Installed	Not Applicable	Concur
91.227 (d)	Minimum Broadcast Message Element Set	Not Installed	Not Applicable	Concur
91.227 (e)	ADS-B Latency Requirements	Not Installed	Not Applicable	Concur
91.227 (g)	Incorporation by Reference	Not Installed	Not Applicable	Concur
91.409	Inspections	Operator Responsibility	Manufacturer has no remarks.	Concur
91.411	Altimeter System and Altitude Reporting Equipment Tests and Inspections	Operator Responsibility	The tests required by § 91.411(c) were conducted by the manufacturer for issuance for airworthiness certificate.	Concur
91.413	ATC Transponder Tests and Inspections	Operator Responsibility	Manufacturer has no remarks.	Concur
91.507	Equipment Requirement: Over the Top, or Night VFR Operations	Operator Responsibility	Manufacturer has no remarks.	Concur
91.527	Operating in Icing Conditions	Not Applicable	RFM section 1 limitations prohibit operating in icing conditions.	Concur
91.535	Stowage of Food, Beverages and Passenger Service Equipment.	Operator Responsibility	Manufacturer has no remarks.	Concur
91.609 (a)	Operation with Inactive Flight Data Recorder or Cockpit Voice Recorder	Operator Responsibility	Helicopter complies with the pertinent 14 CFR and RFM Supplement Number 7.	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
91.609 (b)	Operation by Other than Holder of Air Carrier or Commercial Certificate	Operator Responsibility	Helicopter complies with the pertinent 14 CFR and RFM Supplement Number 7.	Concur
91.609 (c)	Requirements for Flight Data Recorder - 10+ passengers	Not Applicable	Manufacturer has no remarks.	Concur
91.609 (d)	FDR Operations	Operator Responsibility	Helicopter complies with the pertinent 14 CFR and RFM Supplement Number 7.	Concur
91.609 (e)(f)	Requirement for Cockpit Voice Recorder	Not Applicable	Manufacturer has no remarks.	Concur
91.609 (g)	Accident Reporting	Operator Responsibility	Manufacturer has no remarks.	Concur
91.609 (i)	Cockpit Voice Recorder	Operator Responsibility	Manufacturer has no remarks.	Concur
91.609 (j)	Datalink Recording	Operator Responsibility	Manufacturer has no remarks.	Concur
91.1023 & .1025	Program Operating Manual Requirements and Contents	Operator Responsibility	Manufacturer has no remarks.	Concur
91.1033 (a)(1) & (b)	Cockpit Checklist	Operator Responsibility	Recommended procedures provided RFM in section 2.	Concur
91.1033 (a)(2) & (c)	Emergency Cockpit Checklist	Operator Responsibility	Recommended procedures provided in section 3 RFM.	Concur
91.1033 (a)(3)	Aeronautical Charts	Operator Responsibility	Manufacturer has no remarks.	Concur
91.1033(a)(4)	IFR Navigation/Approach Charts	Operator Responsibility	Manufacturer has no remarks.	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
91.1035 (e)	Automated Briefing Recording	Operator Responsibility	Not Installed	Concur
91.1035(f)	Passenger Briefing Cards	Operator Responsibility	Manufacturer has no remarks.	Concur
91.1109(b)(1)	Manufacturer Aircraft Maintenance Inspection Program	Operator Responsibility	Manufacturer has no remarks.	Concur
91.1115(a)	Minimum Equipment List	Operator Responsibility	An FAA approved MMEL is available on the internet from the FAA FSIMS.	Concur
91.1411	Continuous Airworthiness Maintenance Program	Operator Responsibility	Manufacturer has no remarks.	Concur
135. 21	Manual Requirements	Operator Responsibility	Manufacturer has no remarks.	Concur
135.75 (b)	Inspector's Credential: Admission to pilot's compartment: Forward observer's seat.	Operator Responsibility	Manufacturer has no remarks.	Concur
135.76 (b)	DOD Commercial Air Carrier Evaluator's Credentials: Admission to Pilots Compartment: Forward Observer's Seat	Operator Responsibility	Manufacturer has no remarks.	Concur
135.81 (c)	Aircraft Equipment Manuals and Aircraft Flight Manual	Operator Responsibility	Manufacturer has no remarks.	Concur
135.83 (a)(1) & (b)	Cockpit Checklist	Operator Responsibility	Recommended procedures provided RFM in section 2.	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
135.83 (a)(2) & (c)	Emergency Procedures Checklist	Operator Responsibility	Recommended procedures provided RFM in section 3.	Concur
135.83 (a)(3)	Aeronautical Charts	Operator Responsibility	Manufacturer has no remarks.	Concur
135.83 (a)(4)	IFR Navigation/Approach Charts	Operator Responsibility	Manufacturer has no remarks.	Concur
135.83 (a)(5)	Multiengine Aircraft One-Engine Climb Data	Operator Responsibility	Climb performance charts contained in RFM Section 4B	Concur
135.93	Autopilot: Minimum Altitudes for Use	Operator Responsibility	Manufacturer has no remarks.	Concur
135.99 (a)	Composition of Flight Crew – AFM Limitations	Operator Responsibility	RFM Specifies flight crew in Section 1 limitations.	Concur
135.99 (b)	Second in Command required for 10 or more passenger seating configuration.	Not Applicable	TCDS specifies maximum occupants as 8.	Concur
135.113	Passenger Occupancy of Pilot Seat	Operator Responsibility	Manufacturer has no remarks.	Concur
135.117	Briefing of Passengers before Flight	Operator Responsibility	Manufacturer has no remarks.	Concur
135.122	Stowage of Food, Beverages and Passenger Service Equipment.	Operator Responsibility	Manufacturer has no remarks.	Concur
135.123	Emergency and Emergency Evacuation Duties	Operator Responsibility	Manufacturer has no remarks.	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
135.127	Passenger Information	Operator Responsibility	Manufacturer has no remarks.	Concur
135.128	Safety Belts and Child Restraint Systems	Operator Responsibility	Manufacturer has no remarks.	Concur
135.129(d)(e)	Exit Seating Passenger Information Cards	Operator Responsibility	Manufacturer has no remarks.	Concur
135.143(b)	Approved/Operable Instruments and Equipment	Operator Responsibility	An FAA approved MMEL is available on the internet from the FAA FSIMS.	Concur
135.143(c)	ATC Transponder	Operator Responsibility	Complies	Concur
135.145(d)(1)	Validation Testing	Operator Responsibility	Manufacturer has no remarks.	Concur
135.147	Dual Controls Required	Operator Responsibility	Helicopter is certified IAW part 27 with dual controls.	Concur
135.149(a)	Altimeter Adjustable for Barometric Pressure	Operator Responsibility	Helicopter is certified IAW part 27 with sensitive altimeter.	Concur
135.149(e)	Heating or Deicing Equipment	Operator Responsibility	Helicopter is certified IAW part 27 with heated pitot static system.	Concur
135.149(e)	Additional Equipment Administrator Requires	Not Applicable	Manufacturer has no remarks.	Concur
135.150 (a)	Public Address System	Not Applicable	Manufacturer has no remarks.	Concur
135.150 (b)	Crew Interphone System	Not Applicable	Manufacturer has no remarks.	Concur
135.151(a)	Requirement and Installation of CVR	Not Applicable	Manufacturer has no remarks.	Concur
135.151(b)	Requirement and Installation of CVR	Not Applicable	Manufacturer has no remarks.	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
135.151(d)	Boom and Mask Microphone	Not Applicable	Manufacturer has no remarks.	Concur
135.151(c)(e)	CVR - Recorded Data	Not Applicable	Manufacturer has no remarks.	Concur
135.151(f)	Additional CVR Requirements	Not Applicable	Manufacturer has no remarks.	Concur
135.151(g)	Additional CVR Requirements	Not Applicable	Manufacturer has no remarks.	Concur
135.151(h)	Recording Datalink messages	Not Applicable	Manufacturer has no remarks.	Concur
135.152(a)	Requirement for FDR	Not Applicable	Manufacturer has no remarks.	Concur
135.152(b)	Requirement for Flight Data Recorder	Not Applicable	Manufacturer has no remarks.	Concur
135.152(c)	FDR Operations	Not Applicable	Manufacturer has no remarks.	Concur
135.152(d)(e)	FDR – Recorded Data	Not Applicable	Manufacturer has no remarks.	Concur
135.152(f)	Installation Requirements	Not Applicable	Manufacturer has no remarks.	Concur
135.152(g)	Underwater Locator Device	Not Applicable	Manufacturer has no remarks.	Concur
135.152(h)	Operational Parameters Required to be Recorded	Not Applicable	Manufacturer has no remarks.	Concur
135.152(m)	FDR Requirements	Not Applicable	Manufacturer has no remarks.	Concur
135.155(a)	Fire Extinguishers: Type and Suitability of Agent		Complies	Concur
135.155 (b)	Fire Extinguisher on Flight Deck		Complies	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
135.155(c)	Fire Extinguisher in Passenger Compartment		Complies	Concur
135.156	Flight data Recorders: Filtered Data	Not Applicable	Manufacturer has no remarks.	Concur
135.157(a)	Oxygen Equipment Requirements Unpressurized aircraft.	Not Applicable	Manufacturer has no remarks.	Concur
135.157(c)	Equipment requirement	Not Applicable	Manufacturer has no remarks.	Concur
135.159 (a)-(g)	Equipment Requirements: Carrying Passengers under VFR at Night or under VFR Over The Top Conditions		Complies	Concur
135.161	Radio and Navigational Equipment: Aircraft Carrying Passengers Under VFR at Night or under VFR Over The Top		Complies	Concur
135.163	Equipment Requirements: Aircraft Carrying Passengers Under IFR		Complies	Concur
135.165	Radio and Navigational Equipment: Extended Overwater or IFR Operations	Operator Responsibility	Manufacturer has no remarks.	Concur
135.167	Emergency Equipment: Extended Overwater Operations	Operator Responsibility	Manufacturer has no remarks.	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
135.171(a)	Shoulder Harness Installation at Flight Crewmember Stations		Complies	Concur
135.173(a)	Airborne Thunderstorm Detection Equipment	Not Applicable	Manufacturer has no remarks.	Concur
135.173(f)	Power Supply	Not Applicable	Manufacturer has no remarks.	Concur
135.175(e)	Power Supply	Not Applicable	Manufacturer has no remarks.	Concur
135.177	Emergency Equipment Requirements for more than 19 Passengers	Not Applicable	Manufacturer has no remarks.	Concur
135.179(a)	Inoperable Instruments and Equipment	Operator Responsibility	An FAA approved MMEL is available on the internet from the FAA FSIMS.	Concur
135.179(b)	Instruments and Equipment NOT included in MEL	Operator Responsibility	An FAA approved MMEL is available on the internet from the FAA FSIMS.	Concur
135.181(a)(2)	Performance Requirements: Multi Engine Aircraft Operated Over The Top or in IFR Conditions	Operator Responsibility	Manufacturer has no remarks.	Concur
135.183(a)	Performance Requirements: Land Aircraft Operated Over Water	Operator Responsibility	Manufacturer has no remarks.	Concur
135.183(c)	Performance Requirements: Multi Engine Land Aircraft Operated Over Water	Operator Responsibility	Manufacturer has no remarks.	Concur

<b>14 CFR Section</b>	<b>Title</b>	<b>Compliance</b>	<b>Remark</b>	<b>FSB Finding</b>
135.183(d)	Helicopter flotation devices	Operator Responsibility	RFM Supplement Number 2.	Concur
135.185(a)	Empty Weight and Center of Gravity: Currency Requirement	Operator Responsibility	Manufacturer has no remarks.	Concur
135.185(b)	Aircraft Original Airworthiness Certificate	Operator Responsibility	Manufacturer has no remarks.	Concur
135.227 (a),(b) (c),(e), (f)	Icing Conditions: Operating Limitations	Operator Responsibility	Manufacturer has no remarks.	Concur
135.411(a)(2)	Maintenance Applicability	Operator Responsibility	Manufacturer has no remarks.	Concur
135.419	Approved Aircraft Inspection Program	Operator Responsibility	Manufacturer has no remarks.	Concur
135.421 (b) (c) (d) (e)	Manufacturer's Maintenance Program	Operator Responsibility	Manufacturer has no remarks.	Concur
135.425	Maintenance, Preventive Maintenance and Alteration Programs	Operator Responsibility	Manufacturer has no remarks.	Concur
135.427 (b)	Manual for Maintenance, Preventive Maintenance and Alterations	Operator Responsibility	Manufacturer has no remarks.	Concur