

 CAAT สำนักงานการบินพลเรือนแห่งประเทศไทย The Civil Aviation Authority of Thailand		THE CIVIL AVIATION AUTHORITY OF THAILAND FSTD (H) EVALUATION AND CERTIFICATION CHECKLIST/REPORT		FSTD Certification No.	
NAME OF SIMULATOR OPERATOR		TYPE / VARIANT OF AIRCRAFT		TYPE OF FSTD ☐ FFS Level ☐ FTD Level ☐ FNPT Level	
SIMULATOR LOCATION		SERIAL NUMBER		TYPE OF REQUESTED ☐ INITIAL ☐ RENEWAL ☐ MAJOR MODIFICATION For	
DOCUMENT for INITIAL and RENEWAL ☐ หนังสือรับรองหรือหลักฐานการเป็นนิติบุคคลซึ่งแสดงรายการเกี่ยวกับชื่อ วัตถุประสงค์ที่ตั้งสำนักงาน และรายชื่อผู้เป็นกรรมการ ผู้จัดการ หรือผู้มีอำนาจลงนามผูกพันนิติบุคคลที่เป็นปัจจุบัน ☐ หนังสือมอบอำนาจให้ดำเนินการจากนิติบุคคล แสดงการมอบอำนาจให้ผู้ระบุชื่อในหนังสือมอบอำนาจเป็นผู้ยื่นคำขอ ☐ สำเนาเอกสารแสดงกรรมสิทธิ์ หรือสิทธิครอบครองในเครื่องช่วยฝึกบินที่จะขอใบรับรอง ☐ รายชื่อการแต่งตั้งผู้รับผิดชอบสูงสุด (Accountable Manager) ซึ่งทำหน้าที่ควบคุมการดำเนินงานเครื่องช่วยฝึกบินให้มีคุณภาพและคงมาตรฐานที่ได้รับการรับรอง ☐ รายชื่อและคุณสมบัติของบุคลากรซึ่งทำหน้าที่ควบคุมดูแลบำรุงรักษาเครื่องช่วยฝึกบิน ☐ แผนผัง (Layout) สถานที่ติดตั้งเครื่องช่วยฝึกบิน โดยต้องมีขนาดพื้นที่ และสภาพแวดล้อมที่เหมาะสม ☐ เอกสารต้นฉบับคำแนะนำการทดสอบคุณสมบัติเครื่องช่วยฝึกบิน (Master Qualification Test Guide: MQTG) สำหรับเครื่องบิน ☐ เอกสารการทดสอบคุณสมบัติเครื่องช่วยฝึกบิน (Qualification Test Guide: QTG) โดยมี รายละเอียดตามที่กำหนดในคู่มือการรับรองคุณสมบัติเครื่องช่วยฝึกบินสำหรับเครื่องบิน ☐ คู่มือการใช้งานเครื่องช่วยฝึกบินและรายการตรวจสอบ (User guide manual and checklist) ☐ เอกสารหรือหลักฐานอื่นที่พนักงานเจ้าหน้าที่กำหนด (ถ้ามี) DOCUMENT for RENEWAL (เอกสารเพิ่มเติม) ☐ เอกสารรายการตรวจก่อนทำการฝึกบินประจำวัน (Daily function pre-flight check) ☐ สมุดข้มข้อขัดข้องและข้อแก้ไข (Daily discrepancy log and corrections) ☐ ผลดำเนินการประเมินผลการทดสอบเครื่องช่วยฝึกบิน (QTG) รายปี					
RESULT ☐ SATISFACTORY ☐ UNSATISFACTORY				RECOMMENDATION / RESTRICTION / LIMITATION / MEMORANDUM BY INSPECTOR (IF ANY)	
SIGNATURE:					
INSPECTOR NAME					
DATE					

For FNPT use in multi-crew cooperation (MCC) training the general technical requirements are expressed in the MCC column with additional systems, instrumentation and indicators as required for MCC training and operation.

For MCC, the minimum technical requirements are as for FNPT level II or III, with the following additions or amendments:

1	Multi-engine and multi-pilot helicopter
2	Performance reserves, in case of an engine failure, to be in accordance with Category A criteria
3	Anti-icing or de-icing systems
4	Fire detection / suppression system
5	Dual controls
6	Autopilot with upper modes
7	2 VHF transceivers
8	2 VHF NAV receivers (VOR, ILS, DME)
9	1 ADF receiver
10	1 Marker receiver
11	1 transponder
12	Weather radar

The following indicators shall be located in the same positions on the instrument panels of both pilots:

1	Airspeed
2	Flight attitude
3	Altimeter and radio altimeter
4	HSI
5	Vertical speed
6	ADF
7	VOR, ILS, DME
8	Marker indication
9	Stop watch

FLIGHT SIMULATION TRAINING DEVICE STANDARDS		FFS				FTD			FNPT				COMPLIANCE	
		LEVEL				LEVEL			LEVEL					
		A	B	C	D	1	2	3	I	II	III	MCC		
1.1 General														
a.1	A cockpit that is a full-scale replica of the helicopter simulated. Additional required crew member duty stations and those required bulkheads aft of the pilot seats are also considered part of the cockpit and shall replicate the helicopter.													
	A cockpit that replicates the helicopter.													
a.2	The cockpit, including the instructor's station is fully enclosed.													
	A cockpit, including the instructor's station that is sufficiently closed off to exclude distractions.													
b.1	Full size panels with functional controls, switches, instruments and primary and secondary flight controls, which shall be operating in the correct direction and with the correct range of movement.												For FTD level 1 as appropriate for the replicated system. The use of electronically displayed images with physical overlay or masking for FSTD instruments and/or instrument panels incorporating instrument controls and switches that replicate those of the helicopter and operate with the same technique, effort, travel and in the same direction may be acceptable.	
	Functional controls, switches, instruments and primary and secondary flight controls sufficient for the training events to be accomplished, shall be located in a spatially correct area of the cockpit.													
c.1	Lighting for panels and instruments shall be as per the helicopter.													
	Lighting for panels and instruments shall be sufficient for the training events													

FLIGHT SIMULATION TRAINING DEVICE STANDARDS		FFS				FTD			FNPT				COMPLIANCE
		LEVEL				LEVEL			LEVEL				
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c.2	Cockpit ambient lighting environment shall be dynamically consistent with the visual display and sufficient for the training event.												
	The ambient lighting should provide an even level of illumination which is not distracting to the pilot.												
d.1	Relevant cockpit circuit breakers shall be located as per the helicopter and shall function accurately when involved in operating procedures or malfunctions requiring or involving flight crew response.												
e.1	Effect of aerodynamic changes for various combinations of airspeed and power normally encountered in flight, including the effect of change in helicopter attitude, aerodynamic and propulsive forces and moments, altitude, temperature, mass, centre of gravity location and configuration.												Effects of C _g mass and configuration changes are not required for FNPT level I.
	Aerodynamic and environment modelling shall be sufficient to permit accurate systems operation and indication.												
e.2	Aerodynamic modelling which includes ground effect, effects of airframe and rotor icing (if applicable), aerodynamic interference effects between the rotor wake and fuselage, influence of the rotor on control and stabilisation systems, and representations of nonlinearities due to sideslip, vortex ring and retreating blade stall.												
f.1	Validation flight test data shall be used as the basis for flight and performance and systems characteristics.												Aerodynamic data need not be necessarily based on flight test data.
	Representative generic aerodynamic data tailored to the helicopter with fidelity sufficient to meet the objective tests and sufficient to permit accurate system operation and indication.												

FLIGHT SIMULATION TRAINING DEVICE STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
g.1	All relevant cockpit instrument indications automatically respond to control movement by a crew member, helicopter performance, or external simulated environmental effects upon the helicopter.												
h.1	All relevant communications, navigation, caution and warning equipment shall correspond to that installed in the helicopter. All simulated navigation aids within range shall be usable without restriction. Navigational data shall be capable of being updated.												For FTD 1 applies where the appropriate systems are replicated.
h.2	Navigation equipment corresponding to that of a helicopter, with operation within the tolerances typically applied to the airborne equipment. This shall include communication equipment (interphone and airground communications systems).												
h.3	Navigational data with the corresponding approach facilities. Navigation aids should be usable within range without restriction.												For FFSs and FTDs the navigation database should be updated within 28 days. For FNPTs complete navigational data for at least five different European airports with corresponding precision and non-precision approach procedures including current updating within a period of three months.
i.1	In addition to the flight crew member stations, at least two suitable seats for the instructor and an additional observer shall be provided permitting adequate vision to the crew members' panel and forward windows. Observer and instructor seats need not represent those found in the helicopter but shall be adequately secured to the floor of the FFS, fitted with positive restraint devices and be of sufficient integrity to safely restrain the occupant during any known or predicted motion system excursion.												The competent authority shall consider options to this standard based on unique cockpit configurations. Any additional seats installed shall be equipped with similar safety provisions.

FLIGHT SIMULATION TRAINING DEVICE STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
j.2	Crew member seats shall afford the capability for the occupants to be able to achieve the design eye reference position. In addition to the flight crew member stations, at least two suitable seats for the instructor and an additional observer shall be provided permitting adequate vision to the crew members' panel and forward windows.												The instructor's and observer's seats need not represent those found in the helicopter.
j.1	FFS systems shall simulate the applicable helicopter system operation, both on the ground and in flight. Systems shall be operative to the extent that normal, abnormal, and emergency operating procedures appropriate to the simulator application can be accomplished. Once activated, proper system operation shall result from system management by the flight crew and not require input from instructor controls.												
j.2	FTD systems represented shall be fully operative to the extent that normal, abnormal and emergency operating procedures can be accomplished. Once activated, proper system operation shall result from system management by the flight crew and not require input from instructor controls.												
j.3	The systems should be operative to the extent that it should be possible to perform normal, abnormal, and emergency operations appropriate to a helicopter as required for training. Once activated, proper systems operations should result from the system management by the crew member and not require any further input from the instructor's controls.												
k.1	The instructor shall be able to control system variables and insert abnormal or emergency conditions into the helicopter systems. Independent freeze and reset facilities shall be provided.												FNPT I: applicable only to enable the instructor to carry out selective failure of basic flight instruments and navigation equipment. For FNPT level I: ability to set the FNPT to minimum IMC speed or above.

FLIGHT SIMULATION TRAINING DEVICE STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
I.1	Control forces and control travel which correspond to that of the replicated helicopter. Control forces shall react in the same manner as in the helicopter under the same flight conditions.												For level A only static control force characteristics need to be tested.
	Control forces and control travel shall be representative of the replicated helicopter under the same flight conditions as in the helicopter.												For FTD level 1 as appropriate for the system training required.
	Control forces and control travel shall broadly correspond to that of a helicopter.												Only static control force characteristics need to be tested.
	Control forces and control travels shall respond in the same manner under the same flight conditions as in a helicopter.												Only static control force characteristics need to be tested.
I.2	Cockpit control dynamics, which replicate the helicopter simulated. Free response of the controls shall match that of the helicopter within the given tolerance. Initial and upgrade evaluation shall include control free response (cyclic, collective, and pedal) measurements recorded at the controls. The measured responses shall correspond to those of the helicopter in ground operations, hover, climb, cruise, and auto-rotation.												For helicopters with irreversible control systems, measurements may be obtained on the ground. Engineering validation or helicopter manufacturer rationale shall be submitted as justification for ground test or to omit a configuration. For FFS requiring static and dynamic tests at the controls, special test fixtures shall not be required during the initial evaluations if the FSTD operators QTG shows both test fixture results and alternate test method results, such as computer data plots, which were obtained concurrently. Use of the alternate method during initial evaluation may then satisfy this test requirement. FTD level 2 aerodynamic data can be representative generic and need not necessarily be based on flight test data.

FLIGHT SIMULATION TRAINING DEVICE STANDARDS		FFS				FTD			FNPT				COMPLIANCE
		LEVEL				LEVEL			LEVEL				
		A	B	C	D	1	2	3	I	II	III	MCC	
m.1	Ground handling and aerodynamic programming to include the following: Ground effect - hover and transition IGE. (Ground reaction - reaction of the helicopter upon contact with the landing surface during landing to include strut deflections, tire or skid friction, side forces, and other appropriate data, such as weight and speed, necessary to identify the flight condition and configuration. Ground handling characteristics - control inputs to include braking, deceleration turning radius and the effects of crosswind.												Level A can utilise generic simulation of ground effect and ground handling.
	Ground handling and aerodynamic ground effects models should be provided to enable lift-off, hover, and touch down effects to be simulated and harmonised with the sound and visual system. Generic ground handling and aerodynamic ground effects models should be provided to enable lift-off, hover, and touch down effects to be simulated and harmonised with the sound and visual system.												
n.1	Instructor controls for:												Examples: generic atmospheric models of local wind patterns around mountains and structures.
	(i) wind speed and direction												
	(ii) turbulence												
	(iii) other atmospheric models to support the required training												
	(iv) adjustment of cloud base and visibility												
	(v) temperature and barometric pressure.												

FLIGHT SIMULATION TRAINING DEVICE STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
o.1	Representative stopping and directional control forces for at least the following landing surface conditions based on helicopter related data, for a running landing: (i) dry (ii) wet (soft surface and hard surface) (iii) icy (iv) patchy wet (v) patchy icy												
p.1	Representative brake and tire failure dynamics.												
q.1	(1) Transport delay. Transport delay is the time between control input and the individual hardware (systems) responses. As an alternative, a latency test may be used to demonstrate that the FSTD system does not exceed the permissible delay.												For FTD level 1, only instrument response is required within a maximum permissible delay of 200 ms. For level 'A' & 'B' FFS and level 2 FTD the maximum permissible delay is 150 ms. For level 'C' & 'D' FFS and level 3 FTD the maximum permissible delay is 100 ms.
	(2) Latency. Relative response of the visual system, cockpit instruments and initial motion system response shall be coupled closely to provide integrated sensory cues. These systems shall respond to abrupt pitch, roll, and yaw inputs at the pilot's position within the permissible delay, but not before the time, when the helicopter would respond under the same conditions. Visual scene changes from steady state disturbance shall occur within the system dynamic response limit but not before the resultant motion onset.												For FTD level 1 and FNPT level I, only instrument response is required within a maximum permissible delay of 200ms. For level 'A' & 'B' FFS, level 2 FTD and FNPT level II and III the maximum permissible delay is 150 ms. For level 'C' & 'D' FFS and level 3 FTD the maximum permissible delay is 100 ms. (See Appendix 5 to AMC1 FSTD(H).300.)

FLIGHT SIMULATION TRAINING DEVICE STANDARDS		FFS LEVEL				FTD LEVEL			FNPT LEVEL				COMPLIANCE
		A	B	C	D	1	2	3	I	II	III	MCC	
r.1	A means for quickly and effectively testing FSTD programming and hardware. This may include an automated system, which could be used for conducting at least a portion of the tests in the QTG.												Recommended for FTD Level 1, FNPT level I and II. Automatic flagging of out-of-tolerance tests results is encouraged.
	Self-testing for FSTD hardware and programming to determine compliance with the FSTD performance tests. Evidence of testing shall include FSTD number, date, time, conditions, tolerances, and the appropriate dependent variables portrayed in comparison with the helicopter standard.												
s.1	A system allowing for timely continuous updating of FSTD hardware and programming consistent with helicopter modifications.												
t.1	The FSTD operator shall submit a QTG in a form and manner acceptable to the competent authority. A recording system shall be provided that will enable the FSTD performance to be compared with QTG criteria.												
u.1	FSTD computer capacity, accuracy, resolution and dynamic response sufficient for the qualification level sought.												
v.1	Daily preflight documentation either in the daily log or in a location easily accessible for review.												

Functions and subjective tests

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
a	PREPARATION FOR FLIGHT											
	Preflight: accomplish a functions check of all switches, indicators, systems and equipment at crew members and instructors stations and determine that the cockpit design and functions are identical to that of the helicopter within the scope of simulation.											
	Preflight: accomplish a functions check of all switches, indicators, systems, and equipment at all crew members and instructor's stations and determine that the cockpit design and functions represents those of a helicopter.											
b	SURFACE OPERATIONS											
	(1) Engine start											
	(a) Normal start											
	(b) Alternate start procedures											
	(c) Abnormal starts and shutdowns (hot start, hung start, fire, etc.)											
	(2) Rotor start engagement and acceleration											
	(a) Rotor start engagement and acceleration											
	(b) Ground resonance (if applicable on type)											
	(3) Ground taxi (wheeled aircraft only)											
	(a) Power/cyclic input	*										
	(b) Collective lever/cyclic friction	*										
	(c) Ground handling	*										
	(d) Brake operation	*										
	(e) Tail-nosewheel lock operation	*										
	(f) Other	*										
c	HOVER											
	(1) Lift off	*										
	(2) Hover	*										
	(3) Instrument response											
	(a) Engine instruments	*										
	(b) Flight instruments	*										
	(4) Hovering turns	*	*									

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
	(5) Hover power checks											
	(a) In ground effect (IGE)	*										
	(b) Out of ground effect (OGE)	*										
	(6) Anti-torque effect	*										
	(7) Abnormal/emergency procedures:											
	(a) Engine failure(s)	*										
	(b) Fuel governing system failure	*										
	(c) Hydraulic system failure	*										
	(d) Stability system failure	*										
	(e) Directional control malfunctions	*										
	(f) Other	*										
	(8) Crosswind/tailwind hover	*										
d	AIR TAXI/TRANSIT											
	(1) Forward	*										
	(2) Sideways	*										
	(3) Rearward	*										
e	TAKE-OFF											
	(1) Cat B or single engine helicopters											
	(a) Normal											
	(i) From hover	*										
	(ii) Crosswind/tailwind	*										
	(iii) MTOM	*										
	(iv) Confined area	*										
	(v) Slope	*										
	(vi) Elevated FATO/helideck	*										
	(vii) Vertical	*										
	(b) Abnormal/emergency procedures:											
	(i) Engine failure during take-off (if single engine, up to initiation of the flare)	*					1			1		
	(ii) Forced landing (if single engine, up to initiation of the flare)	*								1		
	(2) Cat A operation for all certified profiles	*					1			1		
	Take-off with engine failure:											
	(i) Engine failure prior to TDP	*					1					
	(ii) Engine failure at or after TDP						1			1		1

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
f	CLIMB											
	(1) Cat B or single engine helicopters:											
	(a) Clear area											
	(b) Obstacle clearance											
	(c) Vertical	*										
	(d) Engine failure											
	(e) Other											
	(2) Cat A operation for all certified profiles											
	with engine failure up to 300 m (1 000 ft) above the level of the aerodrome/operating site											
g	CRUISE											
	(1) Performance characteristics											
	(2) Flying qualities (including turns at rate 1 and 2)											
	(3) Turns:											
	(a) Turns at rate 1 and 2											
	(b) Steep turns											
	(4) Acceleration and decelerations											
	(5) High airspeed vibration cues											
	(6) Abnormal/emergency procedures:											
	(a) Engine fire											
	(b) Engine failure											
	(c) In flight engine shutdown and restart											
	(d) Fuel governing system failures											
	(e) Hydraulic failure											
	(f) Stability system failure											
	(g) Directional control malfunction											
	(h) Rotor vibration cues											
	(i) Other											
h	DESCENT											
	(1) Normal											
	(2) Maximum rate											
	(3) Autorotative (until flare initiation):											
	(a) Straight in	*										
	(b) With turn	*										

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
i	VISUAL APPROACHES											
	(1) Cat B or single engine helicopters:											
	(a) Approach											
	(i) Normal											
	(ii) Steep											
	(iii) Shallow											
	(iv) Vertical											
	(b) Abnormal and emergency procedures:											
	(i) One engine inoperative											
	(ii) Fuel governing failure											
	(iii) Hydraulics failure											
	(iv) Stability system failure											
	(v) Directional control failure											
	(vi) Autorotation											
	(vii) Other											
	(c) Balked landing:											
	(i) All engines operating											
	(ii) One or more engines inoperative											
	(2) Cat A operation for all certified profiles:											
	(a) from 300 m (1 000 ft) above the level of the aerodrome operating site to or after LDP											
j	INSTRUMENT APPROACHES											
	Only those instrument approach tests relevant to the simulated helicopter type or system(s) and MCC training should be selected from the following list.											
	(1) Non-precision:											
	(a) All engines operating											
	(b) One or more engines inoperative											
	(c) Approach procedures:											
	(i) NDB											
	(ii) VOR/DME, RNAV											
	(iii) ARA (Airborne radar approach)											
	(iv) GPS											
	(v) Other											

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
	(d) Missed approach:											
	(i) All engines operating											
	(ii) One or more engines inoperative											
	(iii) Auto-pilot failure											
	(2) Precision:											
	(a) All engines operating											
	(b) One or more engines inoperative											
	(c) Approach procedures:											
	(i) DGPS											
	(ii) ILS:											
	- Manual without flight director,											
	- Manual with flight director											
	- Autopilot coupled											
	- CAT I											
	- CAT II											
	(iii) Other											
	(d) Missed approach:											
	(i) All engines operating											
	(ii) One or more engines inoperative											
	(iii) Auto pilot failure											
k	APPROACH TO LANDING AND TOUCH DOWN											
	(1) Cat B or single engine helicopters											
	(a) Normal approach											
	(i) To a hover	*					1			1		
	(ii) Elevated FATO/helideck											
	(iii) Confined area	*										
	(iv) Crosswind/tailwind	*					1			1		
	(v) Other	*					1			1		
	(b) Touch down:											
	(i) From a hover	*					1			1		
	(ii) Running	*					1			1		
	(iii) Slope	*	*									

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
	(c) Abnormal and emergency procedures during approach to landing and touch down:											
	(i) OEI						1			1		
	(ii) Fuel governing failure						1			1		
	(iii) Hydraulics failure						1			1		
	(iv) Stability system failure						1			1		
	(v) Directional control failure						1			1		
	(vi) Autorotation	*					1			1		
	(vii) Other						1			1		
	(2) Cat A operation for all certified profiles											
	(a) Landing with engine failure:											
	(i) Engine failure prior to or at LDP	*					1			1		
	(ii) Engine failure at or after LDP	*					1			1		
I.	ANY FLIGHT PHASE											
	(1) Helicopter and powerplant systems operation (as applicable)											
	(a) Air conditioning											
	(b) Anti-icing/de-icing											
	(c) Auxiliary powerplant											
	(d) Communications											
	(e) Electrical											
	(f) Lighting systems (internal and external)											
	(g) Fire and smoke detection and suppression											
	(h) Stabiliser											
	(i) Flight controls/antitorque systems											
	(j) Fuel and oil											
	(k) Hydraulic											
	(l) Landing gear											
	(m) Power plant											
	(n) Transmission systems											
	(o) Rotor systems											
	(p) Flight control computers											
	(q) Stability and control augmentation systems (SAS)											
	(r) Voice activated systems											
	(s) Other											

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
	(2) Flight management and guidance systems (as applicable)											
	(a) Airborne radar											
	(b) Automatic landing aids											
	(c) Autopilot											
	(d) Collision avoidance systems (GPWS, ACAS,)											
	(e) Flight data displays											
	(f) Flight management computers											
	(g) Head-up displays											
	(h) Navigation system											
	(i) NVG											
	(j) Other											
	(3) Airborne procedures											
	(a) Quickstop	*	*									
	(b) Holding pattern											
	(c) Hazard avoidance (GPWS, TCAS, Weather radar). As applicable, except for weather radar required for MCC training in FNPT.	*	*									
	(d) Retreating blade stall recovery (as applicable)	*										
	(e) Rotor mast bumping (as applicable)											
	(f) Vortex ring	*										
m	ENGINE SHUTDOWN AND PARKING											
	(1) Engine and systems operation											
	(2) Parking brake operation											
	(3) Rotor brake operation											
	(4) Abnormal and emergency procedures											
	(5) Other											
n	MOTION EFFECTS											
	(1) Runway rumble, oleo deflections, effects of ground speed and uneven surface characteristics	*										
	(2) Buffet due to translational lift	*										
	(3) Buffet during extension and retraction of landing gear	*										
	(4) Buffet due to high speed and retreating blade stall	*										
	(5) Buffet due to vortex ring	*										
	(6) Representative cues resulting from touch down	*										
	(7) Rotor(s) vibrations (motion cues)											

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
	(8) Translational lift	*										
	(9) Loss of anti-torque device effectiveness	*										
o	SOUND SYSTEM											
	Significant helicopter noises should include:											
	(1) Engine, rotor and transmission to a comparable level found in the helicopter.											
	(2) Sounds of a crash should be related to a logical manner to landing in an unusual attitude or in excess of structural limitations of the helicopter.											
	(3) Significant cockpit sounds and those which result from pilot's actions.											
p	SPECIAL EFFECTS											
	(1) Effects of icing:											
	(a) Airframe	*	*				2	2		2	2	2
	(b) Rotors	*	*				2	2		2	2	2
	(2) Effects of rotor contamination.											
q	VISUAL SYSTEM											
	(1) Accurate portrayal of environment relating to simulator attitudes and position.											
	(2) Aerodromes operating sites:											
	(a) The distances at which aerodrome operating site features are visible should not be less than those listed below. Distances are measured from the FATO centre to a helicopter aligned with the FATO approach direction on an extended 3-degree glideslope.											
	(i) Aerodrome definition, strobe lights, approach lights from 8 km											
	(ii) Visual approach aids and FATO/LOF edge lights should be visible from 5km through approach angles up to 12 degrees											
	(iii) FATO/LOF edge lights and taxiway definition from 3 km											
	(iv) FATO and TLOF markings within range of landing lights for night scenes											
	(v) FATO and TLOF markings as required by surface resolution on day scenes											
	(b) At least three different aerodrome operating site scenes which should be:											
	(i) an airport											
	(ii) a surface level confined area and											
	(iii) an elevated FATO											

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
	(c) Representative aerodrome/operating site scene content including the following:											
	(i) Surfaces and markings on runways, operating sites, taxiways and ramps											
	(ii) Lighting for the FATO/TLOF, visual approach aids and approach lighting of appropriate colours											
	(iii) Aerodrome/operating site perimeter and taxiway lighting											
	(iv) Ramps and terminal buildings and vertical objects which correspond to the operational requirements of an operator's LOFT scenario.											
	(v) The directionality of strobe lights, approach lights, runway edge lights, visual landing aids, runway centre line lights, threshold lights, and touch down zone lights on the runway of intended landing should be realistically replicated											
	(3) Representative visual effect of helicopter external lighting in reduced visibility, such as reflected glare, to include landing lights, strobes, and beacons											
	(4) Instructor controls of the following:											
	(a) Cloud base/cloud tops;											
	(b) Visibility in kilometres or nautical miles and RVR in meters or feet;											
	(c) Aerodrome/operating site selection;											
	(d) Aerodrome/operating site lighting;											
	(e) Ground and flight traffic.											
	(5) Visual system compatibility with aerodynamic programming											
	(6) Visual cues to assess sink rate displacements, rates and height AGL during landings (e.g. runways/operating sites, taxiways, ramps and terrain features).	*										
	(7) Visual scene capability:											
	(a) Twilight and night											
	(b) Twilight, night and day											
	(8) General terrain characteristics Below 5 000 ft present realistic visual scene permitting navigation by sole reference to visual landmarks. Terrain contouring should be suitably represented.	*										

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
	(c) Representative aerodrome/operating site scene content including the following:											
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	(7) Visual scene capability:											
	(a) Twilight and night											
	(b) Twilight, night and day											
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TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
	(9) At and below 610 m (2 000 ft) height above the aerodrome operating site and within a radius of 16 km (9 NM) from the aerodrome operating site, weather representations, including the following:											
	(a) Variable cloud density											
	(b) Partial obscuration of ground scenes; the effect of a scattered to broken cloud deck											
	(c) Visual cues of speed through clouds											
	(d) Gradual break out											
	(e) Visibility and RVR measured in terms of distance											
	(f) Patchy fog											
	(g) The effect of fog on aerodrome operating site lighting											
	(10) A capability to present ground and air hazards such as another aircraft crossing the active runway and converging airborne traffic											
	(11) Operational visual scenes which provide a cue rich environment sufficient for precise low airspeed and low altitude manoeuvring and landing											
	(12) Operational visual scenes which portray representative physical relationships known to cause landing illusions such as short runways, landing approaches over water, uphill, downhill and sloping landing areas, rising terrain on the approach path, and unique topographic features.											
	<i>Note - illusions may be demonstrated at a generic aerodrome or specific aerodrome operating site.</i>											
	(13) Special weather representations of light, medium, heavy precipitation and lighting near a thunderstorm on take-off, approach and landing at and below an altitude of 610 m (2 000 ft) above the aerodrome operating site surface and within a radius of 16 km (9 NM) from the aerodrome operating site											
	(14) Wet and snow-covered landing areas including runway operating site lighting reflections for wet, partially obscured lights for snow or suitable alternative effects.											
	(15) The effects of swell and wind on a 3-dimensional ocean model should be simulated.											
	(16) The effects of own helicopter downwash upon various surfaces such as snow, sand, dirt and grass should be simulated including associated effects of reduced visibility.											
	(17) Realistic colour and directionality of aerodrome operating site lighting.											
	(18) The visual scene should correlate with integrated helicopter systems, where fitted (e.g. terrain, traffic and weather avoidance systems and head-up guidance system (HUGS)). (For FTD and FNPT may be restricted to specific geographical areas.) Weather radar presentations in helicopters where radar information is presented on the pilot's navigation instruments. Radar returns should correlate to the visual scene.											
	(19) Dynamic visual representation of rotor tip path plane including effects of rotor start up and shut down as well as orientation of the rotor disc due to pilot control input.											

TABLE OF FUNCTIONS AND SUBJECTIVE TESTS		FFS				FTD			FNPT			
		A	B	C	D	1	2	3	I	II	III	MCC
	(20) To support LOFT, the visual system should provide smooth transition to new operational scenes without flight through clouds.											
	(21) The visual system should provide appropriate height and 3-D object collision detection feedback to support training.											
	(22) Scene quality											
	(a) surfaces and textural cues should be free from distracting quantisation (aliasing)											
	(b) the system lightpoints should be free from distracting jitter, smearing or streaking											
	(c) system capable of six discrete light step controls (0-5)											

Notes: S = Satisfactory; U = Unsatisfactory; N = Not Observed; N/A = Not Applicable

General: Motion and buffet cues should only be applicable to FSTD equipped with an appropriate motion system

(1) Limited to clear area profiles

(2) Limited to performance

An asterisk (*) Check for the absence of negative effect