AIRLINE TRANSPORT PILOTS LICENSE HELICOPTER

(030 00 00 00 - FLIGHT PERFORMANCE AND PLANNING)

JAR-FCL REF NO	LEARNING OBJECTIVES	REMARKS
034 00 00 00	**PERFORMANCE HELICOPTERS**	
034 01 00 00	**AIRWORTHINESS REQUIREMENTS**	
034 01 01 00	**Definition of terms and speeds used in:**	
	JAR FAR 27.1 - Discuss the applicability to small rotorcraft - State weight limitations - Explain the need to meet Appendix C requirements to operate in Category A JAR FAR 29.1 - Discuss the applicability to large rotorcraft with 10 Passengers or more - State weight and passenger numbers limitations - Explain that large rotorcraft may be operated in both Category A and B with different limitations - Discuss the operation of large rotorcraft with 9 Passengers or less - Discuss the operation of large rotorcraft with 10 Passengers or more to operate under Category A	
034 02 00 00	**DEFINITIONS OF TERMS**	
	Define the following terms - Masses - Density altitude - Climb gradient - Unaccelerated flight - V_{LE} - V_{LO} - V_x - V_y - V_{TOSS} - V_{NE} - V_{NO}	

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	- V_{min} Define $V_{maxRange}$ (speed for maximum range) and V_{maxEnd} (speed for maximum endurance) Discuss where they are to be found on a power required or fuel flow chart Define and understand the following terms: - AEO - OEI - Altitude: Discuss that maximum operating altitudes must be defined and shown in the Helicopter Flight Manual - Performance Class 1, 2, and 3 operation: Discuss that these are defined in ICAO Annex 6 Part III and JAR-OPS 3 Subpart F, G, H, & I	
034 03 00 00	**TAKE-OFF, CRUISE – LANDING PERFORMANCE**	
	- Use and interpretation of diagrams and tables associated with CAT A, CAT B, procedures in order to select and develop class 1, 2, 3 performance profiles according to available heliport size and location (surface or elevated). See JAR–OPS 3 Subpart F, G , H , I - Interpret charts showing minimum clearances associated with Category A & B procedures as defined in JAR-OPS 3 Subpart F, G, H & I.	Given relevant charts
034 04 00 00	**PERFORMANCE OF HELICOPTERS JAR OPS 3, SUBPARTS F;G;H;I**	
034 04 01 00	**Applicability_ Performance class1,2 and 3**	
	Define in which class helicopters must be operated and understand why	
034 04 02 00	**General**	
	State the rules regarding helicopter mass - at the start off take-off - in the event of re-planning the operational flight plan Explain the factors likely to affect the mass - effect of altitude	

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	- temperature - humidity and density Subpart G, H,& I - State the location of the approved performance data in the Helicopter Flight Manual	
034 04 03 00	**<u>Terminology</u>**	
	Define the following terms used in JAR-OPS 3, Subparts F, G, H, & I that are not defined in JAR 1 - Category A - Category B - Committal Point - Congested Area - Defined Point After Take-off (DPATO) Class 2 only - Defined Point Before Landing (DPBL) Class 2 only - Distance DR - Elevated Heliport - Exposure Time –Class 2 - Helideck - Heliport - Hostile Environment - Landing Decision Point - Landing Distance Available - Maximum Approved Passenger Seating Configuration - Maximum Permitted Exposure Time - Non –hostile Environment - Obstacle - Performance Class 1, 2, 3 - Rejected Take-off Distance Required (RTODR) - Reported Headwind Component - Rotation Point - R.	

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	- Safe Forced Landing - Take-off Decision Point (TDP) - Take-off Distance Required - Take-off Mass - Touchdown and Lift-off Area	
034 05 00 00	**PERFORMANCE CLASS 1 SUBPART G**	
034 05 01 00	**General and Applicability**	
	State in which category Performance Class 1 helicopters are certified Define operator responsibilities regarding: - Take-off mass with reference to: • Pressure altitude • Ambient temperature - Surface level heliports: • rejected take-off distance • take-off distance required - Elevated heliports/helidecks: • critical power unit failure at or before TDP • critical power unit failure at or after TDP • obstacle clearance margins in general and local additional clearances	
034 05 02 00	**Take-off** (This paragraph line is missing in the syllabus)	
034 05 02 01	**Account of affecting parameters** Show take-off mass compliance taking account of: - pressure altitude - ambient temperature - take-off technique to be used - percentage of head/tail wind that may be used	

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JAR-FCL REF NO	LEARNING OBJECTIVES	REMARKS
	- remaining visual up to TDP	
034 05 02 02	**Take-off Flight Path**	
	Explain the effect of the failure of one power unit (OEI) on: - the reduction in acceleration and vertical performance - the rate of climb required - obstacle clearances both lateral and vertical Use charts to asses vertical and horizontal clearances Use charts for both surface level and elevated heliports and helidecks	Given relevant charts Given relevant charts
034 05 03 00	**<u>En-route Critical Power Unit Inoperative</u>**	
	Discuss how helicopter performance is affected generally by the critical power unit being inoperative when enroute Reference Helicopter Flight Manual - for helicopter limitations - required performance for Category A operations	
034 05 03 01	**En-route Flight Path**	
	Learn the rates of climb and lateral clearances required: - when not visual with the surface - when visual with the surface Learn the descent flight path clearances when not visual with the surface Learn the flight path clearance required in the descent when visual with the surface Discuss: - the effect of wind on the flight path at single engine speed in relation to high ground - the necessity to jettison fuel to reduce helicopter mass - the minimum fuel to which jettison can be made with regard to onshore and offshore alternate heliports / helidecks	

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JAR-FCL REF NO	LEARNING OBJECTIVES	REMARKS
	Explain drift down techniques (JAR-OPS AMC 3295.d) Learn the reduction in flight path width when navigational accuracy can be achieved	
034 05 04 00	**Landing: to surface level heliports; to elevated heliports/helidecks; with critical power failure prior LDP and after LDP**	
	Use charts to establish parameters for selection of surface heliports and elevated heliports / helidecks. Discuss critical power unit failure prior to and after Landing Decision Point	Given relevant charts
034 05 04 01	**Account off affecting parameters**	
	Discuss the affect of the following on the helicopter performance during landing and why they are important to ensure compliance with the regulations: - pressure altitude of the heliport - the expected ambient temperature - the landing technique to be used - the wind components - the landing mass Explain that the portion of flight after LDP must be carried out visually.	
034 06 00 00	**PERFORMANCE CLASS 2 SUBPART H**	
034 06 01 00	**General and Applicability**	
	Discuss: - that it is not always possible to reject or ensure a continued take-off with a critical power unit failure - the approval to operate with exposure time Explain: - who may grant the approval - under what circumstances the approval may be granted - the current validity of the approvals (JAR-OPS3, Subpart H, 3.517)	

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JAR-FCL REF NO	LEARNING OBJECTIVES	REMARKS
	Re-state the definitions of - NON hostile environment - NON congested hostile environment Introduce the following Class 2 definitions: - Defined Point After Take-off (DPATO) - Defined Point Before Landing (DPBL)	
034 06 02 00	**Take-off**	
	Explain rates of climb and compare with Class 1	
	Surface level heliports – operations without exposure time	
	In the event of a critical power unit failure state action: - up to and including DPATO - after DPATO Operations with exposure time JAR-OPS 3 3.520(a)(3 & 4): Elevated heliports or helidecks in a NON hostile environment - Explain the requirements after exposure time up to the DPATO - Explain the requirements after DPATO - Explain the possibilities during exposure time Elevated heliports or helidecks in a NON congested hostile environment Explain that: - the helicopter must be able to continue flight at the end of exposure time - during exposure time a safe forced landing may not be possible Show take-off mass compliance taking account of: - pressure altitude - ambient temperature - take-off procedure to be used - percentage of head/tail wind that may be used - remaining visual up to DPATO	
034 06 02 01	**Take-off Flight Path**	

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	Explain that the distance clearance parameters are the same as Class 1 State that the factors to be considered are the same as in 034 06 02 00	
034 06 03 00	**<u>En-route</u>**	
	Learn the minimum rate of climb in the case of a power unit failure Learn the lateral zone of obstacles to be considered Consider: - Drift down techniques - Fuel jettison - Navigational accuracy	
034 06 04 00	**<u>Landing</u>**	
034 06 04 01	**Landing mass**	
	Explain that the landing mass must be adjusted to achieve 150 ft/ min at 300 m (1000 ft) with a critical power unit inoperative (OEI). Taking into account: - pressure altitude of the heliport - the expected ambient temperature - the landing technique to be used - the wind component - changes in the mass of the helicopter in flight the flight must be carried out visually from DPBL to touchdown Explain that landing techniques vary depending on the location as follows: • **Surface Level Heliports (without exposure time)** State that landing must permit: - OEI before DPBL, continue the flight - OEI at or after DPBL, a safe forced landing on the heliport or surface • **Helidecks or Elevated Heliports in a NON hostile environment** State that landing mass must permit: - OEI before DPBL, continue the flight - OEI between the DPBL and exposure time, carryout a safe forced landing on the heliport or surface	

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JAR-FCL REF NO	LEARNING OBJECTIVES	REMARKS
	- OEI during exposure time, a safe forced landing may not be possible • **Helidecks and Elevated Heliports in a non-congested Hostile Environment** State that landing mass must permit: - OEI up to the beginning of exposure time, continue the flight clearing all obstacles - OEI during the exposure time, a safe forced landing may not be possible Factors to be taken into account: - pressure altitude of the heliport - the expected ambient temperature - the landing technique to be used - the wind component - the landing mass	
034 07 00 00	**PERFORMANCE CLASS 3 SUBPART I**	
034 07 01 00	**General**	
	Explain that helicopters are certified in either Category A or B Explain that operations are only from/to heliports and over such routes, areas and diversions contained in a NON hostile environment where a safe forced landing can be carried out. (Consider exception: operations may be conducted in a hostile environment when approved under JAR-OPS 30005(e))	
034 07 01 01	**Operations – ceiling and visibility limits**	
	Explain that operations may be conducted over water in a hostile environment beyond safe forced landing distance from land but not for more than 10 minutes in any one flight State Minimum Limits for Operation: - ceiling 600 feet - visibility 800 m - operations always conducted in sight of the surface - night operations not permitted - operations not permitted from/to helidecks	
034 07 01 02	**Operations with exposure time**	
	Explain that approval is required to operate to/from elevated heliports in a non-hostile environment with	

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	exposure time to a power unit failure Explain the time frame of the clearance and the purpose of the review scheduled	
034 07 02 00	**Take-off**	
	Discuss the mass restrictions to hover IGE with AEO at take-off power Take into account: - pressure altitude - ambient temperature Discuss if HIGE cannot be established then restrict mass to HOGE	
034 07 03 00	**En-route**	
	State that the helicopter must be capable of flying its intended track without flying below the appropriate minimum flight altitude and the performing a safe forced landing	
034 07 04 00	**Landing**	
	Explain that mass has to be restricted to HIGE Explain that if HIGE is unlikely to be achieved then restrict mass to HOGE	