



ATP Knowledge Test Prep

www.HelicopterTrainingVideos.com

Introduction

Rough notes/memory aids for some of the harder questions in the ATP Helicopter Knowledge Test as of September 2016. I didn't proof-read the notes before sharing, so let me know of any issues/errors etc. Good luck!

W&B

- Change in CG = (weight shifted X distance) / total weight

ADM/CRM

- Experienced pilots make automatic decisions = leading to classic behavior traps
- Human error in air carrier accidents = **60 - 80%**
- Stress is dangerous because = difficulties elsewhere interfere with thought process

Oxygen

- **35,000'** at least one pilot wearing oxygen mask
- Pilot requires oxygen all the time above **12,000'**
- **30** min above **10,000** MSL **10%** passengers oxygen
- Brief passengers on oxygen use = flight over **12,000** (for any time)

Traffic Avoidance

- Most concern of aircraft reference to horizon = on horizon, increasing in size
- Scanning for traffic = **15** sec outside & **5** inside
- Unmanned aircraft may be found = all airspace
- TCAS II = traffic and resolution advisories
- TCAS-II = traffic advisories & resolution advisories in vertical plane
- Report midair near miss = **500** feet or less separation
- NTSB immediate notification for ACAS advisory when = on IFR flight plan and action required to avoid collision

Hazmat

- Max hazmat on passenger aircraft (disregard flammable gas) = **55** lbs
- Hazmat replacement label be determined = shipping papers
- Dry ice requires = proper ventilation
- Liquid oxygen = equipment used to store it must be covered by certificate holder's approved Mx program
- Handling of hazmat requires = training every **24** months
- Max flammable fuel in cabin of small, non-schedule flight in remote area = **20** gals
- Hazmat loaded with no contact with corrosive material = oxidizing agents



ATP Knowledge Test Prep

www.HelicopterTrainingVideos.com

Illusions & Aeromedical

- Narrow runway = approach is actually lower than it appears (appears high)
- Dark/snow/featureless terrain = approach appears too high
- Haze = appear further away from objects
- Rain on windshield = appear higher than actual
- Prevent spatial disorientation = rely entirely on instruments
- Prolonged constant turn, abrupt head movement = Coriolis illusion
- 1 beer detected = **3** hours

DPs

- SID plan view = vectors or navigation the pilot is responsible to follow
- Difference between ODP & SID = ODP does not include ATC climb requirements for traffic separation
- IFR takeoff mins = **1SM** (talking about airplanes, but 1/2 SM for Heli)
- Standard IFR takeoff mins helicopter = **1/2** SM
- Military airport may not take off IFR unless = vis **1SM**
- VTOSS = takeoff safety speed (CAT A helicopter)
- To use RNAV (not GPS) for departure must ensure = position confirmed within **1000** feet at start of takeoff roll

Aerodynamics

- Rotor RPM limited by = centrifugal stresses
- Rotor blade velocity varies = linearly hub to tip
- Velocity of airfoil = linear hub to tip
- Main rotor lift = sum of pressures over various sections of rotor system
- Lift = pressure difference sum along blade
- Parasite drag = drag X velocity squared
- Load factor in constant rate turn = constant
- Load factor = lift divided by total weight
- Steady state constant rate turn = higher stall speed
- Aircraft remains in new attitude after controls neutralized = neutral longitudinal static stability
- Control of helicopter impossible when **15%** disc stalled
- Unanticipated rapid yaw towards advancing blade = main rotor interference LTE

Airport/Nav Aids

- TDZL = symmetrically disposed
- Runway remaining lights = alternating red & white **3000** to **1000** and red after that
- Advantage of HIRL or MIRL = amber lights last **2000**



ATP Knowledge Test Prep

www.HelicopterTrainingVideos.com

- Tri color VASI high = amber
- Taxiway Centerline Lead-off lights = within runway environment or ILS critical area
- After landing at towered airport = exit runway at nearest taxiway & stay on tower freq until told to switch
- ATC hover taxi = under **25'**
- Cleared 'at pilot's discretion' = non movement area
- Pinnacle approach to rooftop heliport = rate of closure (ground speed) is difficult to judge
- Localizer frequency range **108.10** to **111.95**
- Max speed in Class B = **250** (because under 10,000 MSL)

Systems

- Defective transmission is **high** or **medium** frequency vibrations
- Frequency vibration for transmission = high
- Turbine highest temp = turbine inlet
- High humidity = negligible loss of power in modern turbines
- Steady roar and EGT redline = steady state compressor stall - retard power
- Type of compressor stall highest damage potential = steady state stall
- Transient compressor stall = loud bang (flow reversal)
- Inform NTSB when internal turbine part departs through cowling
- Ram & drain hole blocked = no change in airspeed despite large power changes OR may act as altimeter
- Horizontal stabilizer = levels airframe

OpSpec, MEL & Certificate Holder's Manual

- MEL also needs OpSpec from FAA district office
- To use MEL = must also have OpSpec authorizing its use
- What document is approved change to type without recertification = MEL
- Operational control list must be in certificate holder's manual
- Name & title of persons with operational control = certificate holder's manual
- Someone else does Mx = according to certificate holder's manual & FARs 43, 91 & 135
- Procedures for servicing a/c = certificate holder's manual (not Mx manual)
- Procedures for keeping copies of a/c Mx log in a/c and available to personnel set forth in = certificate holder's manual
- Mechanical Reliability Report = each certificate holder
- Who responsible for keeping company manual updated = person furnished with manual
- Passenger transport for compensation or hire = drug & alcohol testing program under **14 CFR 20**
- Exclusive use of = one aircraft capable of at least one operation listed in OpSpecs
- Airport approved to serve community when primary is unavailable = provisional
- Pilot may depart IFR from airport with no IAP = if FAA authorized in OpSpec



ATP Knowledge Test Prep

www.HelicopterTrainingVideos.com

- Authorizations for IFR GPS must include = procedures for loss of RAIM. & air carrier / commercial ops must meet provisions in OpSpecs
- Air carrier flying RNAV to LPV = needs OpSpec authorization
- To conduct IFR at airport with no weather reporting = OpSpec must permit
- Operations over foreign country must comply with = regulations of that foreign country
- Cockpit voice & flight data kept after accident = **60** days
- Carry deadly weapons = crew or others authorized by certificate holder
- Notify air carrier of person authorized to carry deadly weapon (except in emergency) = minimum **1** hour

Pilot Currency, Requirements & Limitations

- **Initial** training when not qualified or served in that aircraft
- Training if not qualified and served in same capacity on aircraft = **initial**
- If SIC wants to be PIC of same aircraft = upgrade training
- Training required for crew who have served in same capacity but in different aircraft = transition training
- Line check for IFR air taxi = civil airway or off published route or part of, in at least one a/c used and takeoff/landings at one or more representative airports
- Pilot authorized to use autopilot in place of SIC may take autopilot check = concurrently with IPC but at **12** month intervals
- PIC IFR line check required = past **12** months flight over civil airway or off route (or part of) in at least one aircraft used
- No IFR unless = passed instrument proficiency check in past **6** months
- IFR on A & B = instrument proficiency check in last **12** months A & **6** months B
- To take ILS CAT II test = **6** ILS in past **6** months (**3** of which can be CAT I with coupler)
- If not 100 hrs PIC in type, add **100'** and **1/2** mile to ILS minimums
- Need to fly **3** Cat II approaches to **150** DH & **1600** RVR before allowed to go lower
- ILS CAT II new pilot limited to = **1600** RVR & **150** DH
- ILS CAT II limitation removed = **3** ILS to **150** DH
- Flight instruction limit by ATP in air carrier = **36** hrs in **7** consecutive days
- Commuter airline pilot Max hours in 7 days = **34**
- Max hours in calendar month = **120**
- Minimum rest for HEMS crew **47** hr duty = **12** hrs
- Fax replacement of medical valid for = **60** days

Aircraft Requirements

- Ground proximity warning turbine-powered airplane **10** passenger seats or more
- Min seating configuration requiring second in command = **10**
- Shoulder harness installed for crew = **10** pax seats or more
- **19** seats (excluding pilots), how many first aid kits = none
- **20** or more seats = **1** first aid kit



ATP Knowledge Test Prep

www.HelicopterTrainingVideos.com

- Autopilot may not be used instead of second in command if = seats (other than pilot) **10** or greater
- Commuter Air Carrier for autopilot & no second in command = autopilot able to move controls & maneuver **3** axis
- Coupled autopilot **50'**AGL or malfunction whichever higher
- Critical engine out airplane **50 fpm** at MEA or **5000**
- Load manifest required for = any aircraft with more than 1 engine
- Aircraft operated extended overwater operations = life preserver for each occupant
- Extended overwater operations = life raft with survival ELT
- Carry on baggage or cargo must not block exits
- Cargo on scheduled passenger flight = if not stowed in approved bin, must be secured using safety belting approved tie down device
- Airborne WX radar required on large transport category engaged in = passenger-carrying operations
- Oral passenger briefing = conducted by crew/pilot & supplemented by **printed** card

IAPs

- IAP may not be started unless authorized wx reporting station indicates wx = at or above authorized landing minimums for that procedure
- LDA vs ILS = ILS aligned to runway
- Copter SID/DP = **70** kts and **20:1** OCS
- Copter approach vs normal approach = copter approach may require climb gradient twice that of normal
- Lowest Cat **IIIA** ILS = RVR **700**
- CAT I ILS middle marker inop = no effect
- ILS CAT II below 150 DH = TDZL, RCLS & RVR
- How can pilot tell if ILS (MALSR) has penetration of OIS = vis required no lower than **3/4** SM
- **GQS** = limits obstruction between **DA** & runway threshold
- GBAS (LAAS) = precision navigation (align & descent) to runway
- GBAS = precision approach with vertical guidance
- PRM = radar for close parallel runways
- PRM approach may require = monitoring two frequencies at once
- Stabilized approach method, max descent on final = **1000** fpm for both precision and non precision
- Procedure turn max speed **200** IAS
- Pilots responsible for knowing = if they can make an RNAV arc at designated speed
- WAAS LPV AND LNAV/VNAV MNM UNREL = may not support LPV
- Override of automatic sensitivity on GPS approach = cancels approach mode annunciation
- If VDP on GPS IAP = will not be in sequence of waypoints



ATP Knowledge Test Prep

www.HelicopterTrainingVideos.com

- FAF on RNAV approach = flag change TO to FROM
- GPS overlay not authorized for = **SDF**, LOC & LDA
- “VOR or GPS” in IAP title = phase **3**
- GPS IAP outside USA must be authorized by= sovereign country or governmental unit
- If GPS missed approach not activated, will display = extension of inbound final approach course
- If GPS missed approach first leg = course (not waypoint) = require additional operator action to set course
- GPS missed approach pilot must sequence the receiver = after MAWP
- Missed approach first track is a course (not waypoint) = additional action by operator to set course
- If flying database loaded GPS departure = check terminal CDI sensitivity

IFR XC Procedures

- File IFR at least **30** mins before flight & request clearance not more than **10** mins prior to taxi
- Pretaxi IFR clearance program = request clearance **10** mins or less prior to taxi
- Hold for release = procedure to delay departures due to traffic volume or wx
- EDCT = depart no more than **5** mins late or early
- Gate hold = contact ground prior start engines for sequencing & turbine powered a/c expected to be ready for takeoff when reach runway/warmup area
- /I = RNAV plus Mode C
- LIFEGUARD in remarks
- US = states, District of Columbia, Puerto Rico & possessions including waters & airspace above
- B646 route = LF/MF Oceanic Route
- Purpose of OROCA= emergencies & situational awareness
- Position reports required = over all compulsory reporting points
- Random RNAV route = must all be in radar environment
- Off-airway IFR route defined = all radio fixes it passes over
- Which IFR fixes must be on composite flight plan = fix where IFR portion terminates
- IFR route defined = simplified route using airways, jet routes & transitions
- Critical phase of flight = ground ops, below **10000** except cruise
- Acknowledge altitude assignments/restrictions except those in DPs (& vectors??)
- VFR-on-top services = traffic advisories only
- VFR-on-top not authorized in Class **A**
- Info publication on NAT Minimum Navigation Performance Specifications Airspace = part **91**
- Minimum fuel status = precludes any undue delay
- Minimum condition suggested for declaring emergency = doubtful of a condition that could adversely affect flight



ATP Knowledge Test Prep

www.HelicopterTrainingVideos.com

- Low fuel = if require priority handling, declare fuel emergency and state minutes of fuel remaining
- Priority given by ATC during emergency = written report if requested to ATC manager within **48** hours
- **3*** per seconds, **30*** bank (**25*** bank if flight director) whichever lower
- ADIZ tolerance over water = **20** miles & **5** Mins
- ADIZ tolerance over land = **10** miles & **5** mins
- Holding at IAF after lost radio comes with ATC (assume no EFC) when start approach? Flight plan **ETA**
- Alternative not required if ETA +/- 1hr ceiling = **1500** above lowest published approach minimum or **2000** above airport, whichever higher
- May not select alternative unless forecast/current WX indicate indicate WX above landing minimums = at ETA
- Airport not suitable as alternative if = GPS IAP & you have TSO-**C129** GPS (non WAAS)
- May not begin IFR operation if intended next airport unless above authorized IFR landing minimums = at ETA

Weather Theory & Weather Reporting

- Upslope fog = extends to high altitudes
- Upslope fog = can be very dense
- Sea fog = advection fog
- WX on lee side of big lake = warm air flowing over cold lake fog
- Minimum temperature after sunset
- Common location for inversion = stratosphere
- Air temp changes by compression or expansion = adiabatic
- Saturated air moves downhill, it's temperature increases = slower than dry air because vaporization uses heat
- Northern Hemisphere WX east to west = Arctic & subtropical
- Coriolis in Southern Hemisphere = clockwise around low
- Wet snow = above freezing at flight altitude
- Freezing drizzle/rain excluded from flight test envelope
- Freezing drizzle = collision-coalescence
- Severe icing when below 0C = rain
- Icing most likely = polar regions spring and fall
- Required for structural icing = visible water
- Stationary front = winds move parallel to frontal zone
- When pass through front to cooler air = pressure increases
- Frontal waves = slow moving or stationary front
- Frontolysis = dissipating
- Non frontal instability band = squall line
- Each side of dry line = dew point difference



ATP Knowledge Test Prep

www.HelicopterTrainingVideos.com

- Atmospheric factor causes rapid movement of surface fronts = upper winds blowing across front
- WX after fast moving cold front = clearer skies, turbulent winds & colder temps
- Squall lines most often form = ahead of cold front
- Max wind shear hazard zone in TS = all sides and under TS
- Summer TSs in arctic region move = **NE** to **SW** in polar easterlies
- Atmospheric Pressure is lowest = when TS approaching
- Why TS down drafts so dangerous = rain cools & accelerates
- Water vapor to liquid when lifted in TS = latent heat released to atmosphere
- Airmass vs steady state TS = airmass TS precip & downdrafts retard & reverse up drafts
- Violent turbulence & funnel clouds = cumulus mammatus
- Strongest turbulence = cumulonimbus mamma
- Turbulence due to sharp pressure trough = establish course across trough
- Get out of jet stream turbulence = descend if temp falling
- Greatest turbulence jet stream type = curving jet stream associated with deep low pressure trough
- WX feature near tropopause = max winds & narrow wind shear zones
- NOTAMs on scheduled basis = appended to hourly WX (ATIS)
- Data added to AWOS report limited to = TS, precip & obstructions to visibility
- LAWRS = WX like AWOS with pertinent remarks
- Station pressure = actual pressure at field elevation
- Set altimeter disregard = effects of nonstandard temp/pressure
- A02 = ASOS with precip discrimination
- RAE44 = rain of unknown intensity ended **16** minutes before the hour
- 6//// = indeterminable precip past **3** hours
- SNINCR 1/10 = snow 10" & increase of 1" in last hour
- PROB40 = chance of TS or other precip
- FISDL ground precip map = not appropriate to find path through WX hazard area
- FISDL = 5,000 **AGL** to 17500 **MSL**
- FISDL provides = METAR, SIGMET, PIREP & AIRMET
- Constant Pressure Analysis Chart contours = ridges, lows, troughs and highs aloft
- Isobars on surface analysis chart = reference to sea level
- Isobars on surface WX chart are equal pressure reduced to sea level
- Forecast winds and temp aloft Pacific flight = NCEP
- CST = Zulu **-6** hrs
- SIGMET alert contact nearest AFSS
- SIGMET = **3000** sq miles
- Convective SIGMETS for severe TS = occurring for more than **30** mins of forecast period
- Convective SIGMET issued for line of TS = **60** miles long with TS **40%**
- Convective SIGMET most severe storm = **MEM** (TOP ABV 450)
- Time period Convective SIGMET outlook period = **4** hrs after **WST** valid until



ATP Knowledge Test Prep

www.HelicopterTrainingVideos.com

- Convective Outlook (AC) = probability of convective activity next **3** days
- Convective Outlook chart may develop severe intensity TS = SLGT
- Public severe TS = **58** mph and/or **1"** hail
- Constant pressure chart satellite observation = star
- Constant pressure chart aircraft observation = flag indicating wind direction
- WX depiction chart = actual WX at reporting station
- ATC radar weather = light, moderate, heavy & extreme
- NATP = D and FDC NOTAMs
- Oklahoma to west Tennessee 1200Z = mod turb, freezing over **10,000**
- Convective Outlook (AC) = general & severe TA next **24** hrs
- Radar Summary **C** = north east **20** kts, tops **28,000**
- Radar Summary **B** = rain shower increasing (RW+)
- Interpret jet stream = Alaska, Canada to Great Lakes
- WX inferred by LOW in Canada = slow-moving storm
- Relative moisture of airmass approaching CA = dry
- 12hr SIG WX chart West Virginia = continuous/ showery precip for more than half the area
- 12hr SIG WX chart East Tennessee and east Kentucky = less 1000 foot ceilings and or less 3 SM vis
- SIGMET issued 1600Z is valid to = **2000Z** (4 hrs)
- Precip static problems = up to **30** degree compass errors
- Airframe ice accumulated max = not far below 0C
- Clear & rime mix = **-10** to **-15**
- Fog forms = **5F** and decreasing
- Shear turbulence = with **20** miles of severe TS
- Downdrafts in TS = **2500** fpm
- Slight erratic turbulence 1/3 to 2/3 of the time = intermittent light turbulence
- Vertical wind shear critical for turbulence = **6+** kts per **1000** feet
- Horizontal wind shear (moderate turbulence) per 150 miles = **18+** knots
- Storm gust front moves = **15** miles ahead of precip
- Severe wind shear = IAS change **15** kts
- Wind speed change through peak microburst = **45** kts
- Microburst duration = **10-20** mins from hitting ground to dissipated
- Strong wind shear = pressure side of **100** kt jet stream core
- Squall = increase **15+** knots to **20+** sustained **1+** minute
- Hurricane = sustained **65** kts
- CAT most likely = **20** kt isotachs less than **150** NM apart
- CAT mountain wave = **5000** above tropopause && upper trough polar side jet stream
- Minimum cloud thickness for light or greater precip = **4000** feet
- Low clouds = surface to **6500**