VT-6 Expanded NATOPS Briefing Guide

1) **Aircrew**
   a) **EP / Question / Quote of the Day**
   b) **IMSAFE / Human Factors / Crew Day and Rest / Work Week limits**
   c) **Form Specific:** Designated Section Lead / Formation Lead
   d) **Seat Position** (INAV or IP/IP only)
   e) **Current read and initial**
   f) **Current NATOPS / Pubs / Charts/ EKB packed & charged**
   g) **SNA EKB use and restrictions** SNA should brief the acceptable use according to COMTRAWINGFIVEINST 3710.19F and enclosure (4) of same instruction.
   h) **Review ATJ to include:**
      i) Airsickness history
      ii) Below MIF / incomplete items in block / SSRs
      iii) Previous hop complete or incomplete
      iv) Mandatory or optional warm up window
      v) Review green/blue card
   i) **DOR/TTO Policy**
   j) **JPPT Discussion Items** (May be moved to end of brief at IP's discretion)

2) **Mission Conduct**
   a) **Side Number / Callsign**
   b) **Walk / Takeoff / Land times**
   c) **Weather / NOTAMS / AHAS / TFRs**
   d) **TOLD** (student calculates own TOLD data) For KNSE, plan worst case scenario: 6,000 ft runway, 0 winds, RWY14 at .7% downhill grade.
   e) **Flight Plan**
   f) **Profile** – Origin / Departure / Stage Maneuvers / Destination / Alternate
   g) **Fuel management**
      i) Joker / Bingo / Divert – Discuss reasoning for Joker / Bingo / Divert values and when to change them.
      ii) Minimum / Emergency Fuel – Declare minimum or emergency fuel if calculated to land below 200lbs or 120lbs respectively.
   h) **Frequencies / NAVAIDS**
      -Presets / As Assigned / Tactical Frequencies
      -At a minimum IP shall monitor UHF at all times for GUARD transmissions. NAVAID set to 112.3 or as required. Review VHF/UHF Tactical Frequencies (Form events only).
   i) **Radio procedures and discipline**
      -Pilot at the controls will make all radio calls unless otherwise briefed using standard clear and concise COMMS. The non-flying pilot will back up the flying pilot listening for own aircraft's callsign.
   j) **Change of aircraft controls**
      -Execute a positive three way change of controls to include the UFCP with emphasis on the word "controls." i.e. "I have the controls," "You have the controls," "I have the controls." The flying pilot may request UFCP inputs from the non-flying pilot. The non-flying pilot will inform the flying pilot of any changes to the FMS/UFCP to avoid entry errors. If in doubt as to who has the controls, maintain control and verify who has the controls. In the event of ICS failure "shake to take, pump to pass."

k) Non flying pilot duties for IMC flight and instrument approaches

-Call out deviations of:

- +/- 10 KIAS, +/-10° of heading, +/- 100' of altitude, greater than 30° angle of bank (AoB), pitch attitudes greater than 15° nose up and 10° nose down.

-Less than a minute to live (VSI rate greater than RADALT altitude)

-Vertigo or Spatial-D

-Runway in sight

-Use the two-challenge rule, if the other crewmember doesn't respond after two calls, assume the controls.

-Brief any additional assigned duties for flight.

l) Clearing / Lookout procedures

-Call out traffic using the clock system (e.g. 1 o'clock, 2 o'clock, 3 o'clock), approximate range, high/level/low, factor/no factor.

-Be directive vice descriptive to avoid a collision (e.g. BREAK RIGHT, BREAK LEFT, etc.).

-Any crewmember can assume controls to avoid a collision.

- If directed by ATC to find traffic or follow traffic, coordinate internally before communicating externally.

3) <u>Emergencies / Crew Coordination</u>

a) Aircraft Emergencies and System Failures

i) Actual:

-Treat all emergencies as actual unless prefaced by the word "simulated."

- No fast hands in the cockpit.

-Maintain aircraft control, analyze the situation, take appropriate actions, and land as soon as conditions permit.

-Pilot at the controls will execute all CAMIs or any other actions appropriate to the malfunction (as dictated by the PIC).

-Consult the PCL when safe to do so confirming all CAMIs and non-critical action memory items with full consideration of all notes, warnings, and cautions. Consider having the rear cockpit occupant fly while the front cockpit occupant runs complex or non-CAMI EPs as they have access to most CB's and all switches.

-Determine the landing criteria and land as required.

ii) Simulated:

-All simulated EPs will be prefaced with "Simulated."

-SNA will analyze the situation as provided by the IP, determine the appropriate EP, state the Critical Actions Memory Items (CAMIs) over the ICS and WILL NOT move any switches or pull any circuit breakers.

-DO NOT PULL THE PCL OFF DURING A SIMULATED EP!

(1) PCL control- simulated PEL vs. simulated forced landing

-The IP will initiate a simulated power loss/engine failure scenario by setting the PCL to idle and stating "simulated."

-Once the SNA has determined it would be appropriate to move the PCL to OFF based on simulated EICAS indications and energy state, he/she will state SIMULATED- PCL OFF. The IP will then set 4-6% Tq when SNA states "SIMULATED- PCL OFF."

-The SNA will retain control of the PCL for safety of flight, low energy state, or if wave-off is required. The intent is to complete the simulated forced landing to a touch and go with the PCL set at 4-6% Tq to simulate a touch down with a feathered prop.

b) Aborted Takeoff

-Abort for any master warning, unsafe aircraft state, or runway hazard at or below max abort speed for the respective runway condition (dry/wet). Master cautions will be considered on a case by case basis to mitigate a high speed abort.

-The command will be "**ABORT, ABORT, ABORT**," maintain aircraft control: PCL IDLE, BRAKES AS REQUIRED.
-Do not sacrifice directional control for braking action.

c) Engine Failure / Un-commanded Power Change

-Maintain aircraft control, trading airspeed for altitude, while analyzing engine operation using primarily N1 and ITT to avoid shutting down a potentially good engine. If N1 reads 0% w/in 5 seconds with ITT rapidly decreasing, execute engine failure during flight procedure.
-State CAMIs for the brief.
-Do not descend below 2000' AGL with a failed engine unless on profile, runway in sight, maneuvering capability, 300' AGL final decision to eject, 200' gear down, 100' on centerline (ORM 321).
-If N1 reads 50% or more and ITT is not decreasing, use Np, Torque, etc to determine if uncommanded prop feather or other malfunction exists (e.g. compressor stall).
-State uncommanded power change / loss of power / uncommanded prop feather CAMIs for the brief.

d) Damaged Aircraft / Midair / Birdstrike

-If both aircrew are so injured they cannot control the aircraft or the aircraft is unable to remain airborne – conduct immediate or time critical ejection based on urgency and remaining altitude.
-If the aircraft is controllable – Determine the nature of the damage and perform a Controllability Check in VMC above 6,500' AGL (minimum) IAW NATOPS, recommend 8,000 to 10,000' AGL.
-Birdstrike Within Prop Arc – Consider a PEL to the nearest suitable field.
-Birdstrike Outside Prop Arc – If controllability is in question, perform a Controllability Check.

e) Stall / Out of Control Flight (spin, spiral, etc) Recognition & Recovery

-Stalls, not properly recovered, will lead to out of control flight (OCF). Un-intentional OCF is avoided through proper stall recognition, prevention, and recovery. Stall indications include stick shaker, aerodynamic buffet, un-commanded pitch up, nose drop, and wing roll-off, or up and down pitch oscillations with increasing airspeed and G's known as pitch "bucking." The T-6B AOA PFD display indications may lag the actual AOA value depending on how rapidly a stall is entered; however, if the stick shaker (no lag) is active, the AOA is at or above 15.5 units. Anytime stall indications are inadvertently encountered, the immediate response should be:

1. **Relax** back stick to reduce angle of attack
2. Select **Max** power
3. **Level** the wings
4. Center the **ball**

-Once the aircraft is flying again, avoid obstacles by climbing between 14 and 17.9 units AOA. In the landing pattern, ground track should be abandoned to get the wings level and produce the most lift away from the ground. Failure to properly recover from a stall can lead to OCF.
-OCF is indicated by random, un-commanded oscillations in pitch, roll, and yaw and/or when the aircraft is not responding normally to control inputs. A key OCF indicator (evidenced by 2 class A mishaps) is incorrect application of back stick in an attempt to recover without the nose rising regardless of increasing airspeed or AOA less than 18 units. Unusual attitude recovery procedures have no effect if the aircraft is stalled or in OCF. OCF can be extremely disorienting, do not wait to determine the difference between erect spin, spiral, progressive spin, etc. Any time OCF is encountered, the immediate response is:

1. PCL – Idle
2. Controls – Neutral
3. Altitude – Check
4. Recover from unusual attitude

-*The single most important factor in recovering from an inadvertent Out-of-Control situation is patience.* If the aircraft is not recovering, re-check altitude for ejection decision. If sufficient altitude remains, push through the trim while visually verifying the stick is in the physical neutral position vice the trimmed position (i.e. try more centered and forward stick) and wait for the aircraft to recover.

Note

Landing gear and flap position has no effect on T-6 recovery characteristics. Retracting the gear and flaps in an inadvertent Out-of-Control encounter may exacerbate the condition.

f) Radio Failure / ICS Failure: Begin troubleshooting by swapping COMM plugs, verifying helmet/mask connections, checking audio panel settings and verifying correct frequency or attempting COMMS on previously assigned frequency or different radio. If these methods do not work, try bypassing the audio management unit (AMU) with the NATOPS loss of ICS procedure.

If all troubleshooting attempts fail:

-Squawk 7600.

-Make all calls and announce intentions "in the blind".

-If attempting to return to NSE, adhere to the FWOP/IFG procedures. If outside the local area, follow the Flight Information Handbook (FIH) procedures. *(SNAs should be prepared to discuss the FWOP and FIH procedures in depth upon IP request. [Contact SNAs not responsible for IMC procedures])*

Loss of ICS:

Keep the mask on, if able, and use a discrete frequency on the radio not in use (246.8 or 123.45) for internal communication. If a discrete frequency does not work, drop the mask and shout (consider cockpit altitude and coordinate a descent if necessary). Consult the PCL for *Loss of ICS procedure* remembering that if fully followed, UHF will be unavailable and VHF un-amplified.

-If unable to restore ICS, use pump to pass/shake to take to transfer control to the PIC. All training will be terminated and the IP will RTB or land as required.

g) Inadvertent IMC

VFR flight plan:

-Maintain aircraft control.

-Establish an instrument scan and check altitude.

-If altitude below Maximum Elevation Figure (MEF) + 1000' or (OROCA), execute immediate climb to safe altitude turning away from known obstacles. Do not attempt to regain VMC below the calculated or published safe altitude!

-If altitude above MEF+1000 or OROCA, with smooth coordinated controls, get out of IMC the way it was entered if climbing descend (etc.)

-If unable to regain VMC, IP will contact nearest ATC facility and coordinate an IFR clearance. If swift contact cannot be made, Squawk 7700, declare an emergency, and use guard as appropriate.

IFR flight plan:

-During any VMC transition on an approach (i.e. Circling) and IMC is encountered, execute missed approach turning towards the airport and climb via the published missed or climb out instructions.

-Reference MSA as required.

h) Downed Pilot / Aircraft:

-PIC will assume on scene commander duties

-Follow procedure in TW-5 In-Flight Guide

-Set bingo to the nearest suitable field

-Establish a max endurance profile and stay on scene until:

-Bingo fuel.

-Encountering an emergency of our own

-Properly relieved by a more capable SAR platform.

i) Landing Irregularities / Wave-Off

-Wave-offs are free, but once called are mandatory. If the reason for wave-off is not known, discuss with the other aircrew once the aircraft is safely climbing. If contact flight, brief the FWOP 6, 3, 2, 1 rule…Wave-off PPEL/P if gear and/or flaps not down by 600' AGL (base key), 300' AGL safe position to land, 200' AGL gear confirmed down, 100' AGL on centerline, no-flap ELPs shall not be conducted. Wave-off ELP if airspeed less than 110KIAS on final prior to landing transition or stick shakers inside base key. Wave-offs during normal pattern OPS shall comply with FTI criteria (AOB>45 deg, shakers inside the 90, etc).

-If a landing irregularity (e.g. porpoise, high flare, late / rapid flare, floating, ballooning, bouncing, drift / crab, wing rise, hard landing) is encountered or the SNA, IP, RDO, tower, direct a wave-off, advance PCL (up to MAX, as required) while simultaneously setting the takeoff attitude.
-If required, avoid traffic IAW the FWOP OLF procedures or tower directions.
-Once stabilized with two positive rates, raise flaps as appropriate and reset power to 60%-70% to capture 120 KIAS.

j) Loss of Directional Control on Runway / Departing the Prepared Surface

-If the aircraft appears to be departing the runway due to improper control inputs, blown tire, or brake malfunction, attempt to re-gain flight via wave-off procedures if airspeed and obstacles allow.
-If the aircraft is too slow or unsafe to get airborne, conduct the emergency engine shutdown procedure as soon as departure is recognized.
-Priority is securing the PCL.
-Immediate ejection should be considered at high rates of speed, high angle off runway centerline, departing into unfavorable terrain, or if the aircraft may roll over. As a **technique**, immediate ejection criteria is met if the aircraft is traveling with the nose 45° off centerline causing possible roll over **and** more than 45 knots ground speed.

k) CFS: Command and crew coordination

On deck IAW emergency ground egress:

-Call "Standby CFS" and allow time to remove pins. Confirm pins removed in each cockpit.
-Call "**CFS, CFS, CFS**" (locate, rotate, and pull on the third command) for simultaneous detonation.

Airborne: (If required for in flight smoke/fume elimination assuming initial NATOPS procedures of descend below 10,000 MSL, pressurization switch to ram/dump, and bleed air inflow off are not effective.)

-Stow CFS pin in a flight suit pocket prior to detonating the canopy to prevent the pin from possibly interfering with flight controls.
-Detonate the aft transparency IAW NATOPS calling "**CFS, CFS, CFS**" for awareness of the front cockpit occupant.
-At all times, fly with mask on, visor down, collar up, gloves on, and sleeves rolled down to avoid skin injuries.

l) Ejection: 6,000'AGL OCF, 2,000' AGL controlled. Calculate highest field elevation along route of flight to determine BARO ALT reading (e.g. highest field elevation we will encounter today is Evergreen, so ejection readings will be 6,300 and 2,300). Consider use of MOR handle if operating in terrain above 8,000 MSL. Proper body position on the way up, execute I-I-R-O-K on the way down (ADR for a water entry scenario). All ejection criteria assume ISS Mode Selector in BOTH.

i) Immediate:

-Utilized when terrain impact or death is imminent and an ICS call would delay ejection to the point both aircrew are outside the envelope for survivability.
-Either occupant pull the handle. It's better to be injured and alive than dead due to delaying for the call and good body position.

ii) Time Critical:

-Utilized when terrain impact or death is NOT imminent, but landing at a suitable field is not an option.
-If able, aircrew should:
-LOCK (harness), TALK (distress call with position anchored to the nearest NAVAID or airfield), SQUAWK (7700, ELT on) per NATOPS forced landing procedures.
-Point the aircraft toward an unpopulated area
-Roll wings level
-Minimize sink rate
-Initiate ejection: First "EJECT…" call – Assume proper body position, third "EJECT..."call – both aircrew pull their respective handles.

iii) Controlled / Planned:

-Communicate intentions to ATC (and wingman if applicable).
-Proceed toward FWOP provided waypoints (0R1, KNFJ) when in the local area. Locate unpopulated area when outside the local area.
-Each cockpit occupant will complete the controlled ejection checklist up to step 11.

-PIC will take controls and select PCL OFF.
-PIC will then call "EJECT, EJECT, EJECT!"

iv) Loss of ICS (depending on the nature of the audio management unit failure, these procedures do not necessarily assume a loss of external communications)
-Immediate: Prioritize initiating ejection over signaling to eject.
-Either occupant pull the handle.
-Time Critical:
-LOCK (harness), TALK (distress call with position anchored to the nearest NAVAID or airfield), SQUAWK (7700, ELT on) per NATOPS forced landing procedures.
-Steer the aircraft toward an unpopulated area
-Roll wings level
-Minimize sink rate
-Initiate ejection
-Whoever bangs on the canopy will pull their respective handle (ditty: "whoever does the pounding, does the pulling"). The cadence for the pilot initiating will be "BANG, BANG, BANG…grab handle, PULL." If the other crewmember has not observed initiation of the ejection sequence after 3 seconds, they will pull their respective handle.
-Controlled / Planned:
-Gain the other crewmember's attention with the "face-curtain" signal to show intentions to eject.
-Show the Pocket Checklist to the other crewmember confirming initiation of the controlled ejection checklist.
-When complete with the checklist up to step 11, give a thumbs up signifying "ready for ejection."
-The PIC will take the controls, select PCL OFF, and initiate the ejection sequence with "BANG, BANG, BANG…grab handle, PULL" cadence.

v) Environmental conditions- winds / water temp
-Winds and water temps should be known to make a sound controlled / planned ejection location choice. Example: If winds are strong and water temps acceptable, perhaps water is best. If winds are light and water temps cold, land may be best. Water temps can be found at the National Data Buoy Center website: https://www.ndbc.noaa.gov

vi) Post Ejection Procedures:
-I-I-R-O-K (Cover over land and over water scenarios during IIROK discussion)
-Inspect canopy and risers
-Inflate LPU
-Release raft over water using kit release handle on left side of seat.
-Over land: Do NOT RELEASE RAFT.
-Options (V-O-G-S-L)
Visor, Oxygen mask, Gloves, SSK, LeMoinge slots/steering toggles
-Over land
-Mask - On
-Visor - Down
-Gloves - On
-SSK
-Night or over trees - Retain SSK for injury prevention.
-Day time and safe cleared landing site - Below 200' AGL, release SSK using lower fittings to facilitate PLF.
-LeMoinge slots/toggles – Steer into the wind.
-Over water
-Mask - Remove
-Visor - Up
-Gloves - Stow in survival vest
-SSK - Raft already released
-Koch fittings (upper)
-Over land
-Release after Parachute Landing Fall

-Over water
-Release after feet touch the water
-A-D-R over water
-Avoid - Parachute
-Disentangle - Disentangle from risers using hands, avoid kicking with feet
-Retrieve - Retrieve life raft and survival items. Release right lap strap only to board the raft.
- Locate the AN/URT-140 seat beacon and set it to BLADE, UNTIMED, 406.
- Attempt to establish communication with the other crewmember via cellphone and/or 282.8 on the PRC-648 survival radio.
- Once the seat beacon is set, attempt to contact SAR assets using the PRC-648 on 243.0.
- Once in communication with a SAR asset, be prepared to switch to 282.8 if directed.

4) <u>Mission Specific ORM</u>

a) Contact

i) G-warm: Discuss procedure.

ii) Energy Management: Discuss efficient execution of maneuvers (i.e. energy gainer followed by loser)

iii) Area Management: Minimum altitude for aerobatics, wind effects, how to intercept course rules without OLF operations.

iv) Clearing Procedures: Minimum 45° AoB, max 60° AoB clean, Max AoB 45° dirty, for a total of 180° turn or two turns of 90°. If aerobatics in Pelican/Wahoo, TCAS shall be set to ABOVE.

b) Formation

i) Blind: IAW FTI/VT-6 Formation Supplemental. Lead will relay the rendezvous position (Point 1) via TAC frequency.

ii) Lost Sight: Discuss procedures IAW the FTI (straight and level, turns into wing man, turns away from wingman, climbs/descents, and section approach).

iii) G-warm / Tail Chase: Discuss procedure and limits IAW FTI.

iv) Knock it Off / Terminate: Brief definition, proper procedures, and safety parameters.

c) INAV

i) Spatial Disorientation: Discuss VMC into IMC and vice versa. Additionally, discuss how abrupt corrections can induce vertigo and spatial-D. Discuss recognized vs. unrecognized spatial-D and how to combat using two challenge rule. In certain cases, the affected pilot may choose to recover by continuing to remain at the controls and focus on the instruments. In severe cases, the un-affected pilot will take the controls.

ii) Missed Approach Criteria:
-Runway environment not in sight at Decision Altitude/Missed Approach Point.
-Full scale CDI deflection at any point on the approach.
-Faulty RAIM for RNAV approach.
-Inability to safely land from the MAP.

iii) Missed Approach vs. Climb-out Instructions:
-Missed approaches shall be conducted IAW FTI procedures when the above criteria are met, and a full stop landing is intended.
-Set full power, set attitude 10-15° nose up, raise gear and flaps, and comply w/published missed or climb out instructions.
-Climb out instructions are for practice approaches and should be received from the approach controller prior to being switched to the tower controller.

d) Night

i) Sunset/Moonrise:
-Discuss night vision adaptation.
-Check illumination levels vs cloud cover.
-Sunset/moonrise considerations
-Takeoff no earlier than 30 minutes after sunset for night contact.

ii) Personal equipment: Clear visor, flashlight etc.

iii) Aircraft / Cockpit lighting:

-Check all lights prior to start.
-Day into night, all lighting starts bright and is dimmed as it gets darker.
-Starting at night, lighting set to lowest readable level.
-Anti-collision lights off in the line area to prevent blinding line personnel.

iv) Spatial-D:
- **(1)** - Spatial Disorientation: Discuss VMC into IMC and vice versa. Additionally, discuss how abrupt corrections can induce vertigo and spatial-D. Discuss recognized vs. unrecognized spatial-D and how to combat using two challenge rule. In certain cases, the affected pilot may choose to recover by continuing to remain at the controls and focus on the instruments. In severe cases, the un-affected pilot will take the controls.
- **(2)** Minimize abrupt corrections that may worsen or re-introduce spatial-D.

v) Night landings/Fixation:
-Understand how runway characteristics and lighting can alter visual perception of the landing transition.
-Don't spot the deck, look long for line up to obtain peripheral cues.

vi) Lookout/Obstacle avoidance:
-Utilize good VFR scan.
-Focal blind spot
-VMC night specific illusions (false horizons, autokenesis, flicker vertigo, false glide slopes [No VGSI available], etc).

e) VNAV

i) Route brief:
-Route entry (the first checkpoint)
-Leg timing
-Turns
-Route exit (last checkpoint).

ii) Route restrictions:
-Obstacles
-Altitude restrictions
-Restricted/prohibited areas.

iii) Planned Altitudes/Airspeeds

iv) RADALT Settings

v) MSA/ESA: Ensure it is thoroughly understood and accurate for the entire route

vi) Deteriorating WX: Especially applicable at night when WX conditions are hard to see. Obscuration of the sky, cultural lighting, increase flashing from anti-collision lights, etc. will be indicators of deteriorating weather. When it is unsafe to continue, climb to or above the safe altitude and obtain an instrument clearance. Do not become a controlled flight into terrain (CFIT) statistic!

vii) Loss of Situational Awareness

f) CCX / Off Station OPS

i) PPR/Fuel Packet

ii) Contract Fuel/FBO

iii) Suitable runway at destination

iv) Airfield familiarity/review: layout, NOTAMS, parking location

v) Oil/Parking brake status sign (available at FDO desk)

vi) Orders/tax exempt forms/lodging/transportation

vii) Government Travel Card/Review Admin Department's CCX Student Information Guide (provided by Admin attached to SNA orders)

g) IP / IP

i) Test completed within 60 days

ii) Complacency

iii) Student Trends