***T-44A Briefing Guides***



EVENT: **I4601**

**SYLLABUS NOTES:**

1. Each flight should consist of a mix of approaches flown in the I4100 block.
2. Events should have a minimum of four approaches per event and include at least two procedure turn approaches. Emergency procedures should be emphasized in this block.
3. Each event shall include a minimum of one approach with the flight director and one approach without the flight director.
4. Holding should be accomplished and graded on at least two events, one of which should be GPS holding.
5. All events shall include a missed approach and should include at least two circling missed approaches in the block.
6. One approach per event with IP as PF and SMA as PM, emphasizing CRM callouts, radio communications, and emergency procedures.
7. SMAs shall bring one DD 175 per flight plan per SMA and one DD 175-1 per aircraft for their planned profile to every brief. SMAs shall draft a flight plan than will execute the required maneuvers for the events.

**DISCUSS ITEMS:** Vmca, Vmcg, PIC Decision Making, WW vs. Convective Sigmet, Wake Turbulence, Other Discussion Items at discretion of the IP.

**Vmca –**

NATOPs 24.2.1 - Air minimum control speed is the minimum flight speed at which the aircraft is directionally controllable as determined in accordance with Federal aviation regulations. The aircraft certification conditions include the critical (left) engine becoming inoperative and windmilling, a 5° bank towards the operative engine, full rudder deflection, takeoff power on the operative engine, landing gear up, flaps in takeoff position, and most rearward CG. For some conditions of weight and altitude, stall can be encountered at speeds above VMCA as established by the certification procedure described above, in which event shall speed must be regarded as the limit of effective directional control.

**Vmcg –**

NATOPs 24.2.1 - This is the minimum speed at which the aircraft can maintain runway centerline using rudder/ aileron inputs alone (no brakes/loss of nosewheel steering) if an engine fails during the takeoff run. This airspeed is approximately 63 knots.

**PIC Decision Making –**

**WW vs. Convective Sigmet –**

 OPNAVINST 3710.7U -

4.8.4.5 Severe Weather Watch Bulletins

The Service Storm Prediction Center (SPC), Norman, OK, issues severe WW bulletins in CONUS. They are responsible for issuing these threats in text as well as graphical formats. WW bulletins are issued for areas where conditions are favorable for development of severe weather and warnings are issued by local National Weather Service forecast offices where these conditions are actually occurring. Severe thunderstorm and tornado warnings should be treated similar to WW bulletins when flight planning. Except for operational necessity, emergencies, and flights involving all-weather research projects or weather reconnaissance, pilots shall not file into or through areas for which the SPC has issued a WW unless one of the following exceptions apply:

a. Storm development has not progressed as forecast. For air operations originating/terminating at naval installations, local installation commanding officers and/or wing commanders may continue operations in areas under a WW based on a determination that storm development has not progressed as forecast for the planned route of flight. Normally, such determination should include verification by a DoD forecaster or an FSS. For naval aviators contemplating flight operations from other DoD or commercial airfields, flight operations through WW are authorized only if storm development has not progressed as forecast for the planned route as verified by DoD forecasters or an FSS. In either situation:

(1) VFR filing is permitted if existing and forecast weather for the planned route permits such flights.

(2) IFR flight may be permitted if aircraft radar is installed and operative, thus permitting detection and avoidance of isolated thunderstorms.

(3) IFR flight is permissible in controlled airspace if VMC can be maintained, thus enabling aircraft to detect and avoid isolated thunderstorms.

b. Performance characteristics of the aircraft permit an en route flight altitude above existing or developing severe storms.

**Note -** It is not the intent to restrict flights within areas encompassed by or adjacent to a WW area unless storms have actually developed as forecast.

Weather Study Guide –

 Para. 801. – WW are issued for two types of expected severe weather conditions:

1. Funnel clouds or tornadoes.
2. Severe thunderstorms, defined by frequent lightning and one or more of the following:
	1. 50 knots of wind or greater;
	2. ¾ inch diameter hail or greater.

Convective SIGMETs are issued in the conterminous U.S. for any of the following:

1. Severe thunderstorm due to:

a. surface winds greater than or equal to 50 knots
b. hail at the surface greater than or equal 3/4 inches in diameter
c. tornadoes.

2. Embedded thunderstorms.
3. A line of thunderstorms.
4. Thunderstorms greater than or equal to VIP level 4 affecting 40% or more of an area at least 3000 square miles.

Any Convective SIGMET implies severe or greater turbulence, severe icing and low level wind shear. A Convective SIGMET may be issued for any convective situation which the forecaster feels is hazardous to all categories of aircraft.

Convective SIGMET bulletins are issued for the Eastern (E), Central (C) and Western (W) United States (Convective SIGMETs are not issued for Alaska or Hawaii). The areas are separated at 87 and 107 degrees west longitude with sufficient overlap to cover most cases when the phenomenon crosses the boundaries. Thus, a bulletin will usually be issued only for the area where the bulk of observations and forecast conditions are located. Bulletins are issued hourly at H+55. Special bulletins are issued at any time as required and updated at H+55. If no criteria meeting a Convective SIGMET are observed or forecast, the message "CONVECTIVE SIGMET ... NONE" will be issued for each area at H+55. Individual Convective SIGMETs for each area are numbered sequentially (01 - 99) each day, beginning at 00Z. A continuing Convective SIGMET phenomenon will be reissued every hour at H+55 with a new number. The text of the bulletin consists of either an observation and a forecast or just a forecast. The forecast is valid for up to 2 hours.

**Wake Turbulence –**

 AIM –

Page PCG-6 - AIRCRAFT CLASSES− For the purposes of Wake Turbulence Separation Minima, ATC classifies aircraft as Heavy, Large, and Small as follows:

**a.** Heavy− Aircraft capable of takeoff weights of more than 255,000 pounds whether or not they are operating at this weight during a particular phase of flight.

**b.** Large− Aircraft of more than 41,000 pounds, maximum certificated takeoff weight, up to 255,000 pounds.

**c.** Small− Aircraft of 41,000 pounds or less maximum certificated takeoff weight.

7-3-2 Vortex Generation–

(Talks about how vortices are created. When viewed from a trailing position, left wing vortex rotates clockwise and right wing vortex rotates counterclockwise.) Most of the energy is within a few feet of the center of each vortex, but pilots should avoid a region within about 100 feet of the vortex core.

 7−3−3 Vortex Strength -

a. The strength of the vortex is governed by the weight, speed, and shape of the wing of the generating

aircraft. The vortex characteristics of any given aircraft can also be changed by extension of flaps or other wing configuring devices as well as by change in speed. However, as the basic factor is weight, the vortex strength increases proportionately. Peak vortex tangential speeds exceeding 300 feet per second have been recorded. The greatest vortex strength occurs when the generating aircraft is HEAVY, CLEAN, and SLOW.

b. Induced Roll 2. It is more difficult for aircraft with short wingspan (relative to the generating aircraft) to counter the imposed roll induced by vortex flow. Pilots of short span aircraft, even of the high performance type, must be especially alert to vortex encounters.

 7-3-4 Vortex Behavior –

 3. Flight tests have shown that the vortices from larger (transport category) aircraft sink at a rate of

several hundred feet per minute, slowing their descent and diminishing in strength with time and distance behind the generating aircraft. Atmospheric turbulence hastens breakup. Pilots should fly at or above the preceding aircraft’s flight path, altering course as necessary to avoid the area behind and below the generating aircraft. (See FIG 7−3−3.) However, vertical separation of 1,000 feet may be considered safe.

4. When the vortices of larger aircraft sink close to the ground (within 100 to 200 feet), they tend to move laterally over the ground at a speed of 2 or 3 knots. (See FIG 7−3−5.)

5. Talks about the theory of vortex “bounce”. Whatever. Read it if you want.

b**.** A crosswind will decrease the lateral movement of the upwind vortex and increase the movement of the downwind vortex (there is a good graphic of this Fig. 7-3-6). Similarly, a tailwind condition can move the vortices of the preceding aircraft forward into the touchdown zone. THE LIGHT QUARTERING TAILWIND REQUIRES MAXIMUM CAUTION.

 7-3-5 Operations Problem Areas –

b. AVOID THE AREA BELOW AND BEHIND THE GENERATING AIRCRAFT, ESPECIALLY AT LOW ALTITUDE WHERE EVEN A MOMENTARY WAKE ENCOUNTER COULD BE HAZARDOUS.

 7-3-6 Vortex Avoidance Procedures –

 b. The following vortex avoidance procedures are recommended for the various situations:

**1. Landing behind a larger aircraft− same runway**. Stay at or above the larger aircraft’s final approach flight path-note its touchdown point-land beyond it.

**2. Landing behind a larger aircraft− when parallel runway is closer than 2,500 feet**. Consider possible drift to your runway. Stay at or above the larger aircraft’s final approach flight path− note its touchdown point.

**3. Landing behind a larger aircraft− crossing runway**. Cross above the larger aircraft’s flight path.

**4. Landing behind a departing larger aircraft− same runway**. Note the larger aircraft’s

rotation point− land well prior to rotation point.

**5. Landing behind a departing larger aircraft− crossing runway**. Note the larger aircraft’s rotation point− if past the intersection− continue the approach− land prior to the intersection. If larger aircraft rotates prior to the intersection, avoid flight below the larger aircraft’s flight path. Abandon the approach unless a landing is ensured well before reaching the intersection.

**6. Departing behind a larger aircraft.** Note the larger aircraft’s rotation point and rotate prior to the larger aircraft’s rotation point. Continue climbing above the larger aircraft’s climb path until turning clear of the larger aircraft’s wake. Avoid subsequent headings which will cross below and behind a larger aircraft. Be alert for any critical takeoff situation which could lead to a vortex encounter.

**7. Intersection takeoffs− same runway.** Be alert to adjacent larger aircraft operations, particularly upwind of your runway. If intersection takeoff clearance is received, avoid subsequent heading which will cross below a larger aircraft’s path.

**8. Departing or landing after a larger aircraft executing a low approach, missed**

**approach, or touch-and-go landing.** Because vortices settle and move laterally near the ground, the vortex hazard may exist along the runway and in your flight path after a larger aircraft has executed a low approach, missed approach, or a touch-and-go landing, particular in light quartering wind conditions. You should ensure that an interval of at least

2 minutes has elapsed before your takeoff or landing.

**9. En route VFR (thousand-foot altitude plus 500 feet).** Avoid flight below and behind a large aircraft’s path. If a larger aircraft is observed above on the same track (meeting or overtaking) adjust your position laterally, preferably upwind.

 **7-**3-8 Pilot Responsibility –

**c.** Pilots are reminded that in operations conducted behind all aircraft, acceptance of instructions from ATC in the following situations is an acknowledgment that the pilot will ensure safe takeoff and landing intervals and accepts the responsibility for providing wake turbulence separation.

**1.** Traffic information.

**2.** Instructions to follow an aircraft; and

**3.** The acceptance of a visual approach clearance.

e. Heavy and Large Aircraft (summary)

1. Fly on but NOT ABOVE the established glidepath using ILS, Approach lights, or height above for guidance (eg, 3,000 ft at 10 miles, 1500 ft at 5 miles, etc…)

 2. Fly as close to approach course or runway centerline as possible.

 f. Lighter aircraft (summary)

 1. Fly on OR ABOVE glidepath.

 2. If you have visual with preceding heavier aircraft and the runway:

(a) Pick a point of landing no less than 1,000 feet from the arrival end of the runway.

(b) Establish a line−of−sight to that landing point that is above and in front of the heavier preceding aircraft.

(c) When possible, note the point of landing of the heavier preceding aircraft and adjust point of intended landing as necessary.

*EXAMPLE−*

*A puff of smoke may appear at the 1,000−foot markings of the runway, showing that touchdown was that point; therefore, adjust point of intended landing to the 1,500−foot markings.*

(d) Maintain the line−of−sight to the point of intended landing above and ahead of the heavier preceding aircraft; maintain it to touchdown.

(e) Land beyond the point of landing of the preceding heavier aircraft.

 3. If in doubt of separation on visual approaches, query the controller.

 7-3-9 Air Traffic Wake Turbulence Separations

 a. Controllers are required to apply no less than specified minimum separation for aircraft

operating behind a heavy jet and, in certain instances, behind large nonheavy aircraft (i.e., B757 aircraft).

1. Separation is applied to aircraft operating directly behind a heavy/B757 jet at the same altitude or less than 1,000 feet below:

(a) Heavy jet behind heavy jet−4 miles.

(b) Large/heavy behind B757 − 4 miles.

(c) Small behind B757 − 5 miles.

(d) Small/large aircraft behind heavy jet − 5 miles.

2. Also, separation, measured at the time the preceding aircraft is over the landing threshold, is provided to small aircraft:

(a) Small aircraft landing behind heavy jet − 6 miles.

(b) Small aircraft landing behind B757 − 5 miles.

(c) Small aircraft landing behind large aircraft− 4 miles.

 3. Additionally, appropriate time or distance intervals are provided to departing aircraft:

(a) Two minutes or the appropriate 4 or 5 mile radar separation when takeoff behind a heavy/B757 jet will be:

(1) From the same threshold.

(2) On a crossing runway and projected flight paths will cross.

(3) From the threshold of a parallel runway when staggered ahead of that of the adjacent runway by less than 500 feet and when the runways are separated by less than 2,500 feet.

 *NOTE – Controllers may not reduce or waive these intervals.*

 b. A 3−minute interval will be provided when a small aircraft will takeoff:

1. From an intersection on the same runway (same or opposite direction) behind a departing large aircraft,

2. In the opposite direction on the same runway behind a large aircraft takeoff or low/missed approach.

*NOTE− This 3−minute interval may be waived upon specific pilot request.*

c. A 3−minute interval will be provided for all aircraft taking off when the operations are as

described in subparagraph b1 and 2 above, the preceding aircraft is a heavy/B757 jet, and the

operations are on either the same runway or parallel runways separated by less than 2,500 feet.

Controllers may not reduce or waive this interval.

d. Pilots may request additional separation i.e., 2 minutes instead of 4 or 5 miles for wake turbulence avoidance. This request should be made as soon as practical on ground control and at least before taxiing onto the runway.

**Homework: Study 3 things in the FAR/AIM. My choice, but things I haven’t studied before to expand knowledge.**

1. **Section 4-1-20 Transponder Page 4-4-15 –**

If operating at an airport with Airport Surface Detection Equipment − Model X (ASDE−X), transponders should be transmitting “on” with altitude reporting continuously while moving on the airport surface if so equipped.

Some transponders are equipped with a Mode C automatic altitude reporting capability. This system converts aircraft altitude in 100 foot increments to coded digital information which is transmitted together with Mode C framing pulses to the interrogating radar facility.

When making routine code changes, pilots should avoid inadvertent selection of Codes 7500(hijack), 7600(lost comm.) or 7700 (emergency) thereby causing momentary false alarms at automated ground facilities.

Code 7777 (military interceptor operations)

In general, the CFRs require aircraft to be equipped with Mode C transponders when operating:

1. At or above 10,000 feet MSL over the 48 contiguous states or the District of Columbia, excluding that airspace below 2,500 feet AGL;
2. Within 30 miles of a Class B airspace primary airport, below 10,000 feet MSL.
3. Within and above all Class C airspace, up to 10,000 feet MSL;
4. Within 10 miles of certain designated airports, excluding that airspace which is both outside the Class D surface area and below 1,200 feet AGL.

VFR - Code 1200 regardless of altitude unless otherwise instructed.

Military pilots operating VFR or IFR within restricted/warning areas should adjust their transponders

to Code 4000 unless another code has been assigned by ATC.

1. **Section 5−2−6. Departure Restrictions, Clearance Void Times, Hold for Release, and Release Times Page 5-2-4 -**

Clearance Void Times. A pilot may receive a clearance, when operating from an airport without a control tower, which contains a provision for the clearance to be void if not airborne by a specific time. A pilot who does not depart prior to the clearance void time must advise ATC as soon as possible of their intentions. ATC will normally advise the pilot of the time allotted to notify ATC that the aircraft did not depart prior to the clearance void time. This time cannot exceed 30 minutes. Failure of an aircraft to contact ATC within 30 minutes after the clearance void time will result in the aircraft being considered overdue and search and rescue procedures initiated.

*Pilots who depart at or after their clearance void time are not afforded IFR separation and may be in violation of 14 CFR Section 91.173 which requires that pilots receive an appropriate ATC clearance before operating IFR in controlled airspace.*

Hold for Release. When ATC states in the clearance, “hold for release,” the pilot may not depart utilizing that IFR clearance until a release time or additional instructions are issued by ATC. In addition, ATC will include departure delay information in conjunction with “hold for release” instructions. The ATC instruction, “hold for release,” applies to the IFR clearance and does not prevent the pilot from departing under VFR. However, prior to takeoff the pilot should cancel the IFR flight plan and operate the transponder on the appropriate VFR code. An IFR clearance may not be available after departure.

Release Times. A “release time” is a departure restriction issued to a pilot by ATC, specifying the earliest time an aircraft may depart.

Expect Departure Clearance Time (EDCT). The EDCT is the runway release time assigned to an aircraft included in traffic management programs. Aircraft are expected to depart no earlier than 5 minutes before, and no later than 5 minutes after the EDCT.

1. **Section 7-2-2 Altimeter Setting Procedures Page 7-2-1 –**
2. Below 18,000 feet MSL.
3. When the barometric pressure is 31.00 inches Hg. or less. To the current reported altimeter setting of a station along the route and within 100 NM of the aircraft, or if there is no station within this area, the current reported altimeter setting of an appropriate available station.
4. When the barometric pressure exceeds 31.00 inches Hg.
5. For all aircraft. Set 31.00 inches for en route operations below 18,000 feet MSL. Maintain this setting until beyond the affected area or until reaching final approach segment. At the beginning of the final approach segment, the current altimeter setting will be set, if possible.

(b) During preflight, barometric altimeters shall be checked for normal operation to the extent possible.

 (e) Airports unable to accurately measure barometric pressures above 31.00 inches of Hg. will

report the barometric pressure as “missing” or “in excess of 31.00 inches of Hg.” Flight operations to and from those airports are restricted to VFR weather conditions.

(f) For aircraft operating IFR and unable to set the current altimeter setting, the following restrictions apply:

(1) To determine the suitability of departure alternate airports, destination airports, and destination alternate airports, increase ceiling requirements by 100 feet and visibility requirements by 1/4 statute mile for each 1/10 of an inch of Hg., or any portion thereof, over 31.00 inches. These adjusted values are then applied in accordance with the requirements of the applicable operating regulations and operations specifications.

***EXAMPLE−*** *Destination altimeter is 31.28 inches, ILS DH 250 feet (200−1/2 ). When flight planning, add 300−3/4 to the weather requirements which would become 500−11/4.*