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



EVENT: **I4103**

**SYLLABUS NOTES:**

Emphasis for I4103 is Localizer and Localizer Back-Course.

c. Minimum of 4 approaches per event and include at least 2 procedure turn approaches. Normal two-engine approaches should be emphasized in this block, but may introduce minor malfunctions.

d. Each event shall include a minimum of one approach with the FD and one without.

e. Holding should be accomplished and graded on at least two events, one of which should be GPS holding.

f. All events shall include a missed approach and should include at least two circling missed approaches in the block.

g. One approach per event with IP as PF and SMA as PM, emphasizing CRM callouts and radio communications.

h. SMAs shall bring one DD 175 flight plan per SMA and one DD 175-1 per aircraft for their planned profile to every brief. SMAs shall draft a flight plan that will execute the required maneuvers for the events.

**SPECIAL SYLLABUS REQUIREMENTS:** None for I4103.

**DISCUSS ITEMS:** Types of Procedure Turns, LOC Approach, LOC-BC approach, reverse sensing, LOC/LOC-BC configuration point, use of VOR or NDB on ILS/LOC approach and DPs (ODP/SID/VCOA/Vectors), VDP, VDA and Landing Transition.

**Types of Procedure Turns –**

Procedure turns are low altitude course reversals. Depicted as a barb symbol indicating direction or side of the outbound course on which the PT or maneuvering is to be accomplished.

45/180 Maneuver – Intercept and maintain the PT course outbound as soon as possible after passing the PT fix. The remain within distance is calculated from the PT fix unless the IAP specifies otherwise.

Timing outbound is technique only; the goal is to remain within the mandatory distance depicted. Begin timing when outbound abeam the fix. 1 minute is used for standardization, but consider your winds and realize you have to comply with “remain within” distances.

Descent Outbound – Accomplished when outbound/abeam and a parallel or intercept heading. Don’t start descending immediately after passing the PT fix, wait until you are parallel or on an intercept heading with the outbound course.

Course Reversal Maneuver - ICAO and USAF start timing from the start of the 45° turn for categories A and B, and 1 minute 15 seconds for C,D, and E aircraft.

Descent Inbound – Descend once established on the inbound section. This means within half scale deflection (1 dot) or within 5 bearings if on an NDB approach.

80/260 Maneuver – Everything is identical except you don’t use timing on your course reversal maneuver. Turn 80° on the maneuvering side and immediately start a turn 260° in the opposite direction to intercept the inbound course.

**LOC Approach, LOC-BC approach –**

FTI Info -

Localizer approaches are non-precision approaches that use the localizer from the ILS for azimuth guidance, but without the ILS glide slope.

Typically has a usable range of 18 miles with 10° of course centerline unless otherwise stated. Within 10 NM usable range of 35° of course centerline.

Always wise to use another NAVAID if one is available. Use an NDB/OM and watch the tail rise to the selected radial to keep SA on when your CDI should become alive.

11-217 Info –

14.2.2.1.3.6.1. CAUTION: The ILS/LOC approach must be discontinued if the localizer course becomes unreliable, or any time full-scale deflection of the CDI occurs on final approach. **Do not descend below localizer minimums if the aircraft is more than one dot (half scale) below or two dots (full scale) above the glide slope. If the glide slope is recaptured to within the above tolerance, descent may be continued to DH.**

14.2.2.1.3.6.2. NOTE: If making an autopilot coupled approach or landing, use the aircraft flight manual procedures for the category of ILS approach being conducted. When the weather is below 800 foot ceiling and/or 2 miles visibility, vehicles and aircraft are not authorized in or over the ILS critical area when an arriving aircraft is between the ILS final approach fix and the airport (except for aircraft that land, exit a runway, depart or miss approach). However, **when autopilot coupled or auto land operations are to be conducted, and the weather is above ceiling 800 feet and/or visibility 2 miles, advise the ATC approach or tower controller as soon as practical but not later than the FAF**. This will allow time for the appropriate ILS critical area to be cleared or an advisory issued. The advisory used by controllers will be: "Localizer/glide slope signal not protected." In this case be alert for unstable or fluctuating ILS indications that may prevent an autopilot-coupled approach. When aircraft equipment and crew qualification permit, the localizer and glide slope may be used for autopilot operations to the points specified in FLIP for each category of ILS approach, unless a restriction is published on the approach procedure.

14.2.2.1.4. LOC Procedures Without Glide Path Guidance.

14.2.2.1.4.1. **The middle marker may never be used as the sole means of identifying the MAP.** The middle marker may assist you in identifying the MAP on certain localizer approaches provided it is coincident with the published localizer MAP. To determine the location of the MAP, compare the distance from the FAF to MAP adjacent to the timing block. It may not be the same point as depicted in the profile view. If the MM is received while executing such an approach, and your primary indications (DME and/or timing) agree, you may consider yourself at the MAP and take appropriate action. **If the middle marker is the only way to identify the MAP (i.e., timing is not published), then the approach is not authorized**.

14.2.2.1.4.2. CAUTION: Approach procedures without glide path guidance (i.e. LOC) published in conjunction with an ILS cannot always clearly depict the FAF crossing altitude. Careful review of the IAP using the following guidance is required. **The minimum altitude to be maintained until crossing the fix following the glide slope intercept point (normally the FAF will be the next fix) is the published glide slope intercept altitude, altitude published at that fix, or ATC assigned altitude.** For most approaches without glide path guidance the glide slope intercept altitude will be the minimum FAF crossing altitude.

14.2.2.1.4.3 . “Back Course” Localizer. In order to fly a back course localizer approach, **set the published front course in the course selector window.** The term "front course" refers to the inbound course depicted on the ILS/localizer approach for the opposite runway. On the back course approach plate, the published front course is depicted in the feather as an outbound localizer course.

**Reverse Sensing –**

LOC-BC is just an extension of the localizer signal in the opposite direction. Seeing as localizers are positioned on the DEPARTURE end of the runway for which they are intended, if you are flying the BC to the LOC you will be much closer to the localizer and, therefore, the sensitivity will be much greater.

Remember to ALWAYS dial in the front course even when flying the back course to a localizer. Think about it like this, on approach plates, localizer signals are depicted as a shaded half (the right side if you visualize yourself inbound on the front course), and a non-shaded half (the left side). The way localizers work is they use two different frequencies to give your CDI appropriate input. One frequency is transmitted on the shaded portion and one is transmitted on the non-shaded portion. If you move away from the shaded half of the localizer, the CDI will always deflect to the right of the *head of the CDI*, showing you needing to move the aircraft to the right. This is true even on backcourses. If you have the front course dialed in and move away from the shaded portion the CDI will deflect to the right of the *head of the CDI*, showing you to move the aircraft to your left as you are now driving the backcourse.

**LOC/LOC-BC configuration point –**

Configure approximately 3 NM prior to the FAF for a normal approach and when you are in a safe position to land for an emergency approach.

**Use of VOR or NDB on ILS/LOC approach –**

It is always advisable to back up your ILS/LOC approach with any other NAVAID available to you for SA. An NDB/OM along the approach will give you SA on when to expect your CDI to come alive. If the NDB has a DME depicted it can be used to back up the distance from your airfield.

**DPs (ODP/SID/VCOA/Vectors) –**

**Types of IFR Departures - DRVOSS (D**iverse Departure, **R**adar Vectors, **V**isual Climb Over the Airport, **O**bstacle Departure

 Procedure, **S**tandard Instrument Departure, **S**pecific ATC Departure Instructions)

(1) **D**iverse Departures.

What is a “Diverse Departure?” If the airport has at least one instrument approach procedure

(IAP), and there are no published IFR departure procedures (because there were no penetrations to the 40:1 OIS), then an aircraft departing can ensure obstacle clearance by executing a “diverse departure.” In order to fly a diverse departure, fly runway heading until 400' above the field elevation before executing any turns while maintaining a minimum climb gradient of 200 ft/nm (unless a higher gradient is published) until reaching a minimum IFR altitude.

“Will ATC Clear Me for a Diverse Departure?” ATC will not specifically “clear” you for a diverse departure. If you are “cleared as filed” and ATC does not issue you further instructions (by providing radar vectors or assigning a SID/DP), then ATC expects you to execute a diverse departure. If a diverse departure is not authorized for your runway, you must coordinate another runway or departure method with ATC to depart the airport under IFR.

(2) **R**adar Vectors –

If taking off in the radar environment and no clearance is given to fly a SI, ATC departure instructions are normally issued in the form of a heading to fly on departure followed by radar vectors. Exercise caution with this type of departure instruction if IMC will be encountered. Comply with ODP climb gradients for the appropriate runway. If IMC and there is a “climb to (altitude) before turning (direction)” for the runway, climb to the appropriate altitude before turning to the ATC issued heading. Realize ATC does not share obstacle clearance responsibility until they state “radar contact”. If any doubt exists to whether the instruction will provide obstacle clearance, pilots should fly the ODP instructions for the runway/airfield and advise ATC of their intentions.

(3) **V**isual Climb Over the Airfield (VCOA) -

(4) **O**bstacle Departure Procedures (ODP)

Published instrument departure procedures assist pilots conducting IFR flight in avoiding obstacles during climbout to minimum enroute altitude (MEA). Airports having penetrations to the 40:1 OIS will normally have non-standard takeoff weather minimums as well as an IFR Departure Procedure. This information is located in the front of DoD approach plates in the section titled, “IFR Takeoff Minimums and (Obstacle) Departure Procedures.” Every approach chart and SID chart for an airport where takeoff minimums are not standard and/or departure procedures are published is annotated with the symbool  The use of this symbol indicates the separate listing in the front of the approach book must be consulted.

***NOTE:*** *The non-standard weather minimums and minimum climb gradients found in the front of the approach book also apply to SIDs/DPs and radar vector departures unless different minimums are specified on the SID.*

Designing an IFR Departure Procedure. When designing an IFR departure procedure, the four most commonly used methods by the TERPs specialist are listed below. Don’t forget; in some cases, an IFR departure may not be authorized (see figure 402-1).

• Non-Standard Takeoff Weather Minimums. When obstacles penetrate the 40:1 OIS, non-standard takeoff weather minimums are normally provided for some civil pilots to “see-and-avoid” obstacles during departure. “See-and-avoid” is a type of “home field advantage” for pilots who are familiar with the airport’s obstacle environment and who are flying light aircraft usually not capable of meeting the minimum climb gradient. The non-standard takeoff weather minimums do not apply to USN aircraft (OPNAV 3710.7 establishes weather minimums). It is not advisable to use any departure procedure using these non-standard takeoff weather minimums to “see-and-avoid” obstacles. In fact, USAF aircraft are prohibited from IFR takeoff if “see-and-avoid” is required.

• Minimum Climb Gradient. The TERPs specialist may also provide a minimum climb gradient for use with the FAA’s “standard” takeoff weather minimums. This is the type of IFR departure procedure most commonly used. Typically, the non-standard takeoff weather minimums will have an asterisk (\*) leading you to a note which will say something like, “Or standard with minimum climb gradient of 300 ft/NM to 700'.” When using this type of IFR departure, just substitute OPNAV 3710.7 takeoff weather minimums where you see the word “standard.” You must always meet or exceed the published climb gradient for the runway used. Refer to Section 412 (G) Summary of 60-to-1 Rules to convert climb gradients to cockpit VSI equivalents.

• Specific Routing. A third method used by the TERPs specialist is to provide a specific route of flight taking the aircraft away from the obstacle. You have to be careful when using this type of IFR departure. Make sure there is no requirement to use a non-standard takeoff weather minimum in order to execute the procedure.

• Combination of All Three Methods. Some IFR departure procedures use a combination of all three methods. Once again, make sure the procedure does not require the use of non-standard takeoff weather minimums.

Low Close-In Obstacles. The TERPs specialist is not allowed to publish climb gradients to heights 200' less. These are typically obstacles very close to the runway and would create a very large climb gradient.

Instead of publishing a climb gradient, the TERPs specialist will publish a NOTE informing you of the height and location of the obstacles. In addition to complying with the published climb gradient, you must also ensure you can clear any obstacles published in this type of NOTE.

“Will ATC Clear Me for an IFR Departure Procedure?” In most situations, ATC will not specifically clear you for an IFR departure procedure. If you are “cleared as filed” and ATC does not issue you further instructions (by providing radar vectors or assigning a SID/DP), then you are expected to fly the published instrument departure procedure for the runway used.

SIDs/DPs Instead of IFR Departure Procedures. There are some airports that will provide obstacle clearance via a SID/DP instead of establishing an IFR departure procedure. You will be notified via

NOTAM or by a statement in the front of the book under the section titled, “IFR Takeoff Minimums and (Obstacle) Departure Procedures.” The statement will say, “RWY XX, use published DP for obstacle avoidance.”

(5) **S**tandard Instrument Departures (SIDs).

A SID is an ATC coded departure procedure established at certain airports to simplify clearance delivery procedures. SIDs are preplanned IFR departure procedures printed for pilot use in graphic and/or textual form. SIDs are supposed to be simple, easy to understand, and (if possible) limited to one page. The actual SID is depicted by a heavy black line; thin black lines represent transition routings. The departure route description should be complete enough that the pilot can fly the SID with only the textual description. Pilots operating from locations where SIDs exist can expect an ATC clearance containing a SID.

Military SIDs. Generally speaking, military SIDs provide you with more information than civil SIDs. The phrase “military SIDs” applies mainly to USAF/USN SIDs in the CONUS (Army SIDs are produced by the FAA in the CONUS and should be treated as civil SIDs). An example of a military SID is the BOOMERFIVE DEPARTURE at Corpus Christi NAS.

Obstacles Are Charted. On a military SID, “prominent” obstacles (not all obstacles) which might create a hazard if departure procedures are not executed precisely, shall be shown in their exact geographic location. When portrayal of several obstacles would create clutter, only the highest of the group must be shown. The distance to the controlling obstacle, upon which the minimum climb rate is predicated, shall be depicted.

ATC Climb Gradients Identified. Military SIDs identify and publish ATC climb gradients exceeding 200 ft/nm. ATC climb gradients are for crossing restrictions or other airspace considerations.

Obstacle Climb Gradients. Military SIDs identify and publish minimum climb gradients exceeding 200 ft/nm which will ensure proper obstacle clearance.

Civil SIDs. Although civil SIDs (FAA and CONUS Army procedures) in the United States are constructed using the same TERPs criteria as military SIDs, the information presented is significantly different. It is important to be aware of the differences. An example of a civilian SID is the BORDER FOUR DEPARTURE at San Diego International Lindbergh Field.

No Obstacles Are Identified or Depicted. Although many obstacles may be present, civil SIDs do not

provide any obstacle information to the pilot.

ATC Climb Gradients. Civil SIDs also do not normally identify ATC climb gradients in any way; it is up to the pilot to recognize and compute any ATC climb gradients.

Obstacle Climb Gradients. On civil SIDs, minimum climb gradients required for obstacle clearance will be depicted in one of two ways: depicted on the SID or included in the IFR departure procedure.

• Climb Gradient Depicted On the SID. At some airports, the minimum climb gradient will be published on the SID. In such cases, although a “trouble T” is depicted on the SID, the climb gradient published on the SID itself takes precedence over the climb gradient contained in the IFR Departure Procedure.

• Climb Gradient Included in the IFR Departure Procedure. In other situations, there will be no climb gradient published on the SID; however, the SID chart will depict a “Trouble T.” In these cases, you must refer to the IFR Departure Procedures in the front of the approach book to determine the minimum climb gradient for the runway used.

“Will ATC Clear Me To Fly a SID?” If ATC wants you to fly a SID, it will normally be included in your clearance. The controller will state the SID name, the current number and the SID transition name after the phrase "Cleared to (destination) airport" and prior to the phrase, "then as filed," for ALL departure clearances when the SID or SID transition is to be flown. Controllers may omit the departure control frequency if a SID has or will be assigned and the departure control frequency is published on the SID.

Restrictions Not Depicted On the SID. If it is necessary for the controller to assign a crossing altitude that differs from the SID altitude, the controller should repeat the changed altitude for emphasis. If you are radar vectored or cleared off an assigned SID, you may consider the SID canceled unless the controller adds “Expect to resume SID.” If ATC reinstates the SID and wishes any restrictions associated with the SID to still apply, the controller will state: “Comply with restrictions.”

***CAUTION:*** *When pilots and controllers discuss changes to SIDs, the potential for miscommunication is high. If there is any question about your clearance, query the controller.*

(6) **S**pecific ATC Departure Instructions.

Before beginning our discussion of specific ATC departure instructions, it’s important to take note of a few terms. The first thing you need to know about a radar departure is what the term “radar contact” means. In plain English, it means the controller sees your aircraft’s radar return on his/her scope and he/she has positively identified you. It’s also important to understand what “radar contact” does not mean – it does not mean the controller now has responsibility for your terrain/obstacle clearance. Specifically, here’s what the AIM says: “The term ‘radar contact,’ when used by the controller during departure, should not be interpreted as relieving pilots of their responsibility to maintain appropriate terrain and obstruction clearance.” The AIM goes on to say “Terrain/obstruction clearance is not provided by ATC until the controller begins to provide navigational guidance in the form of radar vectors.” Even this statement is a little misleading; ATC is never solely responsible for your terrain/obstruction clearance. A better way to describe this relationship would be to say, “ATC does not begin to share responsibility for terrain/obstacle clearance until the controller begins to provide navigational guidance.”

***CAUTION:*** *All ATC systems are not created equal. While you may trust an FAA controller nearly 100 percent, the pilot is always ultimately responsible for terrain/obstacle clearance; be careful who you trust to help you with that responsibility.*

Explanation of the Term “Specific ATC Departure Instructions”. In most cases, the term “specific ATC departure instructions” refers to radar vectors; however, there are some situations when ATC’s departure instructions do not meet the strict definition of a “radar vector.” For example, prior to departure, tower may issue you the following clearance, “Navy 1G411, on departure, turn right heading 360, climb and maintain 5000'.” In this case, technically, this instruction is not a “radar vector” because it is not “navigational guidance based on the use of radar.” Even so, if you are operating in a radar environment, you are expected to associate departure headings with radar vectors to your planned route of flight. Although not as common as the example above, there are situations when ATC may give you specific departure instructions even when radar is not available.

Determining the Required Climb Gradient. Here are two examples. Prior to departure, you receive the following clearance, “Navy 1G411, on departure, turn right heading 350, climb and maintain 5000'.”

Example 1. Let’s say you are departing from a runway that meets diverse departure criteria. You may depart via radar vectors, and a minimum climb gradient of 200 ft/nm will ensure proper obstacle clearance.

Example 2. If you receive the same clearance, but you are taking off from a runway with an IFR departure procedure published, you may follow the departure instructions; however, you must meet or exceed the published climb gradient specified in the IFR departure procedure.

Lack of Specific ATC Departure Instructions.

It is equally important to understand what you must do when you do not have any specific ATC departure instructions. Unless cleared otherwise by ATC (via a SID or radar vector, for example), you must fly the IFR departure procedure established for the runway you select. If the airport meets diverse departure criteria, you may depart using a diverse departure.

**VDP –**

The point on a non-precision approach where a normal descent to landing (approximately 3°) can be made granted you have the runway in sight and are in a safe position to land. If not depicted you can calculate it by dividing your Height Above Touchdown (HAT) by your glideslope (normally 3° or 300 ft).

Remember “Gus Wears a Hat”. HAT

 GS

**VDA –**

Aids in making a stabilized descent to the MDA on non-precision approaches. This is an FAA published angle on non-precision approaches that will give a constant rate of descent from the FAF to the TCH (threshold crossing height). INFORMATIONAL ONLY.

**Landing Transition –** Land the damn plane.