??? ENGINE FAILURE AFTER V2

OBJECTIVES

- To develop the pilot's ability to fly the airplane safely when an engine failure occurs while the aircraft is at low speed, at a high pitch attitude and near the ground such as immediately after takeoff or during a go-around.
- This maneuver is specifically designed to be simple and easy to remember preparing the pilot for the surprise encounter of the engine failure in a challenging regime of flight.
- The design of this maneuver counters the two most dangerous occurrences that can result from a surprise engine failure while the aircraft is in a very low-energy state; (1) the loss of airspeed and subsequent loss of flight control authority, and (2) the application of the incorrect rudder for the asymmetric thrust condition.

STANDARDS

- This is a training, not a checking, maneuver.
- The pilot should be able to put the aircraft in a pitch attitude that keeps the airspeed from falling below VMC for the asymmetric thrust condition with wings level without descending back into the ground.
- The pilot should be able to unerringly apply the correct rudder to bring the aircraft into coordinated flight. Heading is not an immediate primary concern in this maneuver.

PREPARATION

- Begin this maneuver with visual conditions selected. As the pilot gains experience and confidence, introduce instrument conditions.
- By using IP to return to takeoff position and repeating the maneuver, maximum training benefits can be obtained. (Remember to put the gear down in the B-767 sim before the IP.)

TECHNIQUES

- Teach the pilots to speak up immediately when an engine failure is recognized.
- Be sure the pilot does not hesitate in flying the aircraft to the target pitch attitude using the ADI as the primary instrument not the F/D.
- During the first try with this technique, have the pilot put and hold the wings in a level attitude using only the ailerons. Observe that this may require a large input but is possible if the airspeed is not allowed to decay to VMC. Observe that the yoke indicates which rudder should be applied.
- Make sure that the correct rudder is applied in a smooth, measured motion rather than a random, yelking manner. Point out that the application of the correct rudder is a natural, coordinated control input. Emphasize the importance of not using any artificial means of determining the correct rudder such as looking at the engine instruments.
- Have the pilot use the VSI as the primary reference during the level-off but call for ALTITUDE HOLD so that the F/D does not mislead.
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- Consider giving one of these maneuvers during the V1 practice sessions or during a go around.

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BRIEFING NOTES

- Acknowledge the fact that there are many techniques that can be employed to safely fly the aircraft under the subject conditions. However, the following techniques are considered to be safe and efficient.
- Discuss the fact that this training is designed to prepare the pilot for the surprise event that likely will occur at a time when the pilot is least ready for it. The techniques suggested here are intentionally kept simple for that reason.
- Explain that the following techniques can be used for the engine failure during a go-around as well as immediately after takeoff or at any other low-energy regime of flight.
- Remind the pilot that most of the engine-failure training we have experienced has occurred at V1 on the runway. Although many of the principles used in that training still apply, these techniques differ from that training.
- Explain the danger of failing to put the pitch attitude in a position that will conserve the airspeed without descending back into the ground. Give the pilot a target pitch attitude (somewhere near 12.5 degrees, depending on weight).
- Explain the benefits of putting the wings in a level attitude using only aileron; (1) to provide maximum lift, and (2) to indicate, through the yoke position, which rudder requires application.
- After the correct rudder has been applied, the pilot should level the aircraft at or above 500 feet AGL or the appropriate altitude for the conditions. Since the engine has failed after much inertia has been established, the aircraft will most likely have little difficulty reaching 500 feet AGL and may have already exceeded that altitude. The most accurate flight instrument for the level-off is the VSI rather than the F/D. However, the pilot should call for ALTITUDE HOLD so that the F/D does not mislead.
- After the level-off has been accomplished, the aircraft should be safely flown to the appropriate heading.
- The remainder of the maneuver should be managed in the same way as the traditional ENGINE FAILURE AT V1 maneuver.
- Review the suggested priority of actions used with this technique:

  (1) NOSE TO ABOUT 12.5 DEGREES.
  (2) WINGS LEVEL WITH AILERON.
  (3) CORRECT RUDDER (SEE YOKE).
  (4) LEVEL OFF (VSI).
  (5) TURN TO APPROPRIATE HEADING.
  (6) ACCELERATE AND CLEAN UP.

PROBLEMS

- Failure to recognize the engine failure.
- Failure to fly the pitch to the target attitude.
- Failure to hold the wings level.
- Failure to ascertain and apply the correct rudder.
- Rough or random control inputs.