



Sunny Swift

“Impossible turn”

SUNNY AND MOHAMMED, A STUDENT, ARE WAITING AT THE HOLDING POINT, READY TO LINE UP FOR TAKE-OFF

IT IS ESSENTIAL TO ALWAYS CARRY OUT A SHORT BRIEFING BEFORE TAKE-OFF, TO RECALL THE NORMAL DEPARTURE PROCEDURES AND TO REVIEW THE DECISION MAKING PROCESS IN CASE OF AN ENGINE FAILURE.

IF THERE'S A LOSS OF POWER DURING THE TAKE-OFF RUN, REDUCE POWER AND APPLY THE BRAKES

SCREEEECH

DURING THE INITIAL CLIMB, YOU HAVE VERY LITTLE TIME! IMMEDIATELY REDUCE THE ANGLE OF ATTACK BY PUSHING THE STICK FORWARD, GO STRAIGHT AHEAD MAINTAINING SPEED AND TRYING TO AVOID OBSTACLES. IF POSSIBLE, USE THE REMAINING PART OF THE RUNWAY.

NEVER TRY TO FLY BACK TO THE AIRFIELD! REMEMBER THAT YOUR REACTION TIME AFTER AN ENGINE OUT IS CRITICAL. YOU COULD EASILY LOSE SPEED AND STALL! THE CONDITION OF THE ENGINE AND SPEED AWARENESS ARE THE MAIN THINGS!

IF THE ENGINE CUTS OUT BETWEEN 2 000 AND 3 000 FT, YOU HAVE A BIT MORE TIME, BUT NOT ENOUGH HEIGHT AND ENERGY TO RETURN TO THE AIRFIELD.

AS BEFORE, FIRST REDUCE THE ANGLE OF ATTACK: GENTLY BUT FIRMLY PUSH THE STICK FORWARD. LOOK IN FRONT OF YOU FOR THE MOST APPROPRIATE SURFACE, AVOID MORE THAN 15° OF DEVIATION TO THE RIGHT OR TO THE LEFT.

YOU HAVE TO BE PREPARED AND KNOW IN ADVANCE THE EMERGENCY FIELD OPTIONS RIGHT IN FRONT OF THE RUNWAY.

ABOVE A MINIMUM OF 2/3 000 FT AGL, YOU COULD CONSIDER RETURNING TO THE AIRFIELD. BUT IS THAT A GOOD IDEA? SEVERAL FACTORS MIGHT BECOME CRITICAL AND LEAD TO THE “IMPOSSIBLE TURN” CASE!

MAINTAINING SPEED WHILE TURNING BACK WOULD BE VERY DEMANDING, AND THE TIME SHOULD BE SPENT CHECKING THE FUEL VALVE IS OPEN, THE BOOSTER PUMP IS ON, SWITCHING FUEL TANKS AND ... TRYING A RESTART IF POSSIBLE!

LET'S CLIMB TO A WORKING HEIGHT OF 5 000 FT AGL

ALTITUDE 5 000 FT AGL. THIS GIVES A SAFE MARGIN TO SET THE ENGINE TO IDLE, AND SIMULATE A SHUTDOWN.

WE LOWER THE NOSE TO THE PROPER GLIDE ATTITUDE AND MAINTAIN THE AIRSPEED.

THE AIRSPEED HAS PLUMMETED!

PUT THE NOSE DOWN BY 25°, KEEP 80 KTS!

90° TURNED, ALTITUDE LOSS: 570 FT.

180° TURNED. 1 070 FT LOSS

225° TURNED AND HEADING FOR THE RUNWAY. 1 320 FT LOSS

WOULD YOU LIKE TO CLIMB AND TRY AGAIN WITH A HIGHER TURN RATE?

OK, LET'S GO FOR IT

THIS SHOWS THAT YOU SHOULDN'T ATTEMPT A TURN UNLESS THERE'S AN AMPLE HEIGHT MARGIN

-WITH A STANDARD TURN RATE (3°/S, RATE 1*) WE LOST 1 320 FT. WITH A BANK ANGLE OF 45° (RATE 3*) AND IMMEDIATE REACTION, WE LOST 350 FT. THIS 1.4 G MANOEUVRE WAS REALLY STEEP AND DYNAMIC!

-A REAL STOPPED ENGINE WOULD CREATE MORE DRAG THAN OUR SIMULATION IN IDLE. ALSO, TODAY, THERE WAS NO WIND OR ONCOMING TRAFFIC. TYPICALLY, WE'D HAVE TO ADD 4 SEC FOR A PILOT TO REALISE HE'S LOST THE ENGINE. SO THE REAL HEIGHT LOSSES COULD BE A LOT HIGHER.

-WARNING: INCREASING THE BANK ANGLE AT LOW SPEED ALSO INCREASES THE RISK OF STALLING!

Bank Angle	Stall Speed	Increase (%)
0 deg.	49 knots	0%
35 deg.	53 knots	8%
45 deg.	59 knots	20%
60 deg.	71 knots	43%
75 deg.	97 knots	97%

TYPICAL STALL SPEED TABLE
From FAA-P-8740-44

PLEASE FIND MORE INFORMATION AT:

PILOT THOUGHTS:
http://www.maxtrescott.com/max_trescott_on_general_a/2009/05/engine-failure-after-takeoff-turn-back-to-the-runway-or-land-straight-ahead.html

PLEASE SEND US YOUR COMMENTS AND IDEAS:

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