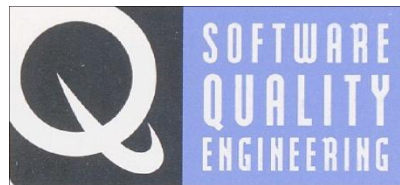


Decision Making Under Extreme Pressure

Lessons Learned From Pilots In Crisis

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My Approach



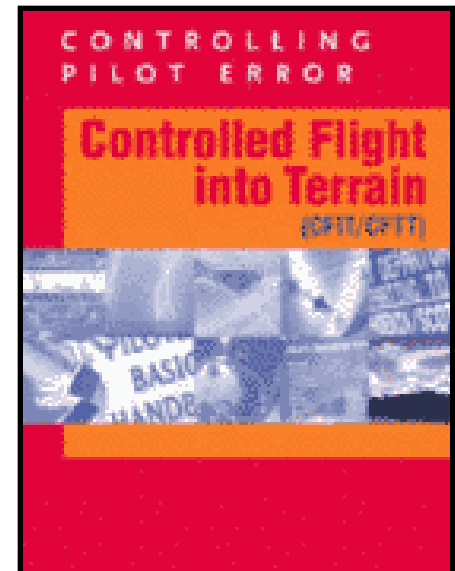
- 1. Gather examples of poor decisions made under extreme pressure.**
- 2. Analyze those decisions to learn how to avoid equivalent mistakes in our own decision making process.**
- 3. Add cute pictures to make the presentation entertaining.**



Controlled Flight Into Terrain



- A marvelous book containing case studies of poor decisions made under extreme pressure.
- Definition: “CFIT is an accident in which an otherwise serviceable aircraft, under the control of the crew, is flown (unintentionally) into terrain, obstacles, or water, with no prior awareness on the part of the crew of the impending collision.”



Case Studies

CFIT: Example 1



We were preparing for the approach at Belize City. Small thunderstorms were in the area as we flew our Boeing 727. There was no moon, no approach lighting system, and no visual approach slope indicator. There were no surrounding lights and it was very dark. Winds were variable at 18 knots gusting to 25. At 5 mi inbound rain started falling heavily.



We had the runway in sight. ... We were at 350 ft. Suddenly we were at 240 ft. We saw that we were low and pushed to go around. Both the captain and I pushed the power up to max. As the aircraft accelerated we felt an impact and a loud thump somewhere on the aircraft.

CFIT: Example 1



The lighting was so poor at Belize that we decided not to make another approach so we diverted to Merida.

Immediately after our landing and parking at the gate, we conducted a postflight inspection. We saw a leading edge wing slat dented from a tree strike and tree branches stuck in the landing gear.

CFIT: Questions



- **What poor decision(s) did this crew make?**
- **Why did these decision(s) seem right at the time?**
- **What forces were pushing for these decisions? Forces against?**
- **What were their effects?**
- **What did they do right?**
- **What generalized learnings can we draw from this example?**

CFIT: Example 1 Learnings



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CFIT: Example 1 Learnings



- **Sometimes, you can enter a holding pattern. Often just waiting a few minutes can allow uncertainties to clear. Don't feel you must immediately press to your destination (or your decision).**
- **Anyone can create a plan; only good leaders think far enough ahead to create a backup. Generally, executing Plan A is not more important than your personal safety and success.**

CFIT: Example 1 Learnings



- **Take a moment to do a cost/benefit analysis. What's the cost if you fail? What's the benefit of pressing on?**

CFIT: Example 2



It was Tuesday evening. It had been a good flight and the crew was almost in Denver. Frank was the first officer of the 727 with about 5000 hours. Ed was the captain with even more flight hours and experience. They were cleared for a visual approach on runway 35L. The captain was flying, descending at a normal airspeed and rate. Everything seemed fine but both the captain and first officer were fixated on runway 35R thinking it was 35L. As they continued the approach they found they had no localizer intercept and realized what had happened. They immediately corrected their heading for 35L. They were at about 6000 feet MSL at the time.



CFIT: Questions



- **What poor decision(s) did this crew make?**
- **Why did these decision(s) seem right at the time?**
- **What were their effects?**
- **What did they do right?**
- **What generalized learnings can we draw from this example?**

CFIT: Example 2 Learnings



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CFIT: Example 2 Learnings



- **Complacency due to familiarity caused a loss of situational awareness.**
- **Trusting, rather than questioning, your experienced co-workers may lead to difficulties.**

CFIT: Example 3



On December 28, 1978, United Airlines Flight 173 departed Denver for Portland, Oregon at 1447 PST with 189 persons on board. The fuel required for the flight was 31,900 lbs. There were 46,700 lbs of fuel on board when it departed.



At 1709:40 as Flight 173 was approaching Portland, the first officer who was flying the aircraft requested the wing flaps be extended to 15 and the landing gear lowered. The captain complied with both requests.

As the landing gear was lowered, both pilots heard a loud noise and felt a severe jolt. The aircraft yawed to the right. The nose gear down light was green.

CFIT: Example 3



0 min At 1712 Portland Approach requested United 173 contact the tower. The captain responded, “Negative, we have a gear problem. We’ll let you know.” Approach responded, “United 173 heavy, roger, maintain 5000 ft, turn left heading 200. I’ll orbit you out there until you get your problem fixed.”

23 min For the next 23 minutes the flightcrew discussed and accomplished all the emergency and precautionary actions available to assure that all landing gear were locked in the full down position.

26 min About 1738 Flight 173 contacted United Control Center, explained their problem and what they had done, reported 7000 lbs fuel on board, and their intention to hold for 15 to 20 more minutes.

CFIT: Example 3



The aircraft continued to circle under the direction of Portland Approach at 5000 ft within 20 miles of the airport.

34 min

At 1746:52 the first officer asked the flight engineer “How much fuel we got?” He responded, “Five thousand.” The first officer acknowledged his response.

36 min

At 1748:54 the fuel pump lights begin to blink indicating 5000 pounds of fuel remaining. The aircraft is 13 mi from the airport moving away to the south.

The flight crew continued to have discussions about the landing gear.

CFIT: Example 3



- 38 min** At 1750:20 the captain asked how much fuel they would have left after 15 more minutes of holding. The flight engineer responded, “Not enough, – fifteen minutes is gonna – really run us low on fuel here.”
- 43 min** At 1755:04 the flight engineer indicated that 4000 lbs of fuel remained, 1000 in each of four tanks.
- 45 min** At 1757:30 the captain and first officer discussed emergency landing preparations for the passengers and crew.
- 50 min** At 1802:22 the flight engineer advised, “We’ve got about 3 on the fuel and that’s it.”

CFIT: Example 3



54 min At 1806:46 the first officer told the captain, “Were going to lose an engine.” The captain replied, “Why?” the first officer replied, “Fuel.” The captain repeated his question and the first officer repeated his answer.

At 1813:21 the flight engineer stated, “We’ve lost two engines, guys.”

61 min At 1813:38 the captain said, “They’re all going. We can’t make Troutdale” (a small airport on the approach route). The first officer said, “We can’t make anything.”

At 1813:50 the first officer called Portland Tower, “United 173 heavy, Mayday. We’re – the engines are flaming out. We’re going down. We’re not going to be able to make the airport.”

CFIT: Questions



- **What poor decision(s) did this crew make?**
- **Why did these decision(s) seem right at the time?**
- **What were their effects?**
- **What did they do right?**
- **What generalized learnings can we draw from this example?**

CFIT: Example 3 Learnings



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CFIT: Example 3 Learnings



- **Beware of channelized attention that pushes all other concerns aside.**
- **Time seems to lengthen – we have plenty of it.**
- **At no time did any of the crew translate ‘pounds of fuel remaining’ into ‘minutes of flying remaining.’ Make someone responsible to call out the vital signs.**
- **We don’t want data – we want useful information.**

Summary

Forces Working Against Us



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Forces Working Against Us



- **It's our job – we've made a commitment.**
- **We have a schedule to keep – we've made a commitment.**
- **We will look foolish.**



Key Learnings



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Key Learnings



- **You could consider a holding pattern.**
- **Always have a Plan B (and C) ready.**
- **Perform a quick cost/benefit study. Is this course of action worth your project? Your sanity? Your life?**
- **Beware of the loss of situational awareness.**
- **Overly trusting your expert co-workers can cause difficulties.**



Key Learnings



- **Make sure you have enough resources to commit to a holding pattern.**
- **Beware of channelized attention.**
- **Beware of time dilation.**
- **We want useful information, not just data.**
- **You have the ethical responsibility to speak up. Vague hints don't always get the job done.**



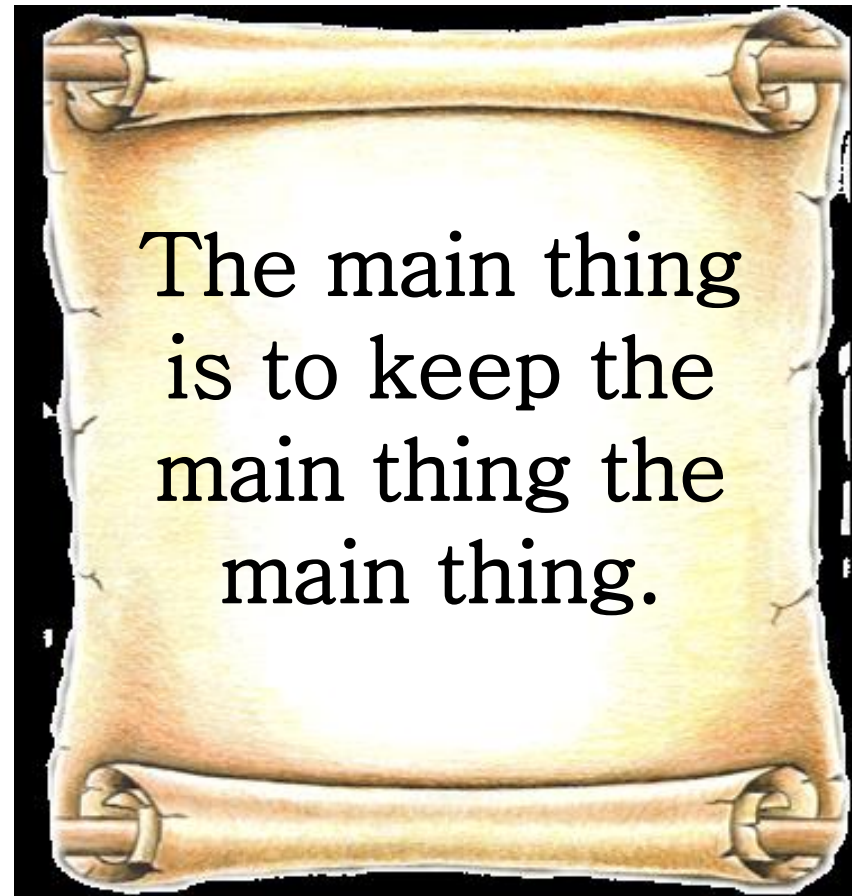
Key Learnings



- **Aircraft: (1) Maintain control, (2) Analyze the situation and take proper action, (3) Land as soon as possible.**

- **Your project: (1) Maintain control, (2) Analyze the situation and take proper action, (3) Finish as soon as possible.**

THE Key Learning



Thanks



- **Thanks for your participation today.**
- **If I can be of assistance, or if you'd just like to chat, please contact me at**

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References



- **Friend, John. *Planning Under Pressure: The Strategic Choice Approach*. Elsevier Butterworth-Heinemann, 2005.**
- **O'Connor, Rochelle. *Planning Under Uncertainty: Multiple Scenarios and Contingency Planning*. The Board, 1978**
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