The complexity of success and failure: the story of the Gimli Glider

@ThaiWoodHere

Pursue second stories beneath the surface to discover multiple contributors.

- David Woods and Richard Cook in Nine Steps to Move Forward from Error

Initial Flight

- July 22, 1983

- Conrad Yaremko notices an issue with the FQIS during checks of the 767.

- Fixes it writes in log book.

Initial Flight

- July 23, 1983, Air Canada Flight 143
    - Tells John Weir.
    - They get a dripstick reading and convert from centimeters to liters to kilograms correctly.
    - John Weir and Donal Johnson fly to Toronto then on to Montreal without issue.

Handoffs

- Captain Pearson and First Officer Quintal take over for the flight to Ottawa.

- Weir, Johnson, and Pearson have a brief hand-off conversation.

Logbook

- Avionics tech Jean Ouellet heads into the cockpit and finds:
    - I001 - @ SERVICE CHK - FOUND FUEL QTY IND. BLANK - CH 2 @ FAULT - FUEL QTY 2 C/B PULLED & TAGGED - FUEL DRIP REQ'D PRIOR TO DEP. SEE MEL 28-41-2
- So he proceeds with the FQIS self test.

Redundancy can create complexity

- Air Canada had procured a spare processor before.
    - But then sent it to France.
- They actually had a spare processor previously loaned by United for the Toronto flight.
- It had been sent around, but had returned to Canada on July 13th.
    - But... it was also faulty.

Redundancy can create complexity

- What about failover?
- Ouellet had actually had recent training that told him that if one channel of the FQIS failed, the other should take over.

Checklists and Documentation

- Minimum Equipment List (MEL):
    - Lists all things that must be working in order to fly.
        - Sometimes understood to be overridable by maintenance.
- "the flight data recorder (FOR) and the cockpit voice recorder (CVR) stopped functioning when they were deprived of electrical power."

You cannot document your way to safety

Investigation

- The "Board, counsel and representatives of the parties" toured the Air Canada training facilities.
- They also toured Boeing's plant in Seattle.
- Also, Honeywell in Minneapolis because they made the FQIS.
- "The witness was being examined from what everyone assumed to be an accurate transcript of the tape. It was nothing of the kind."

Expertise

- Pearson was also a glider pilot:
    - Learned ways of flying that were not taught or used in jetliners
    - Especially a "forward slip"
- Quintal had served in the Royal Canadian Air Force.

This happens every day

- Backups fail
- Emergency operations are not often used
- Documentation is misunderstood

Blame

- "It is, on the basis of all the surrounding circumstances outlined in the evidence, to a certain extent understandable. It was not, nor could it be, justifiable in any circumstances"
- Pearson was demoted for 6 months.
- Quintal suspended for 2 weeks.

Blame

- They would later receive the very first "Diploma for Outstanding Airmanship." from Fédération Aéronautique Internationale (World Air Sports Federation).

Landing

- Ram air turbine controls hydraulic power.
- Landing gear relies on gravity to deploy and lock into place.
    - There is no other control available.
    - The nose wheel does not lock after being dropped.


CANADA