

Sometimes You Do, Sometimes You Don't...

On June 11, 2002, a Piper PA-31-350 Chieftain was on an instrument flight rules (IFR) flight from Gunisao Lake, Manitoba, to Winnipeg. One pilot and six passengers were on board. At 09:13 central daylight time (CDT), the aircraft began an instrument landing system (ILS) approach to Runway 13 at Winnipeg International Airport. The captain flew the approach at a higher-than-normal approach airspeed, well above the glide path. When the aircraft broke out of the cloud layer, it was not in position to land safely on the remaining runway. The captain executed a missed approach at 09:16, and shortly thereafter, at 09:18, the captain declared a 'Mayday' for an engine failure. Less than 20 seconds later the captain transmitted that the aircraft had experienced a double engine failure. The aircraft crashed at a major traffic intersection at 09:20, striking traffic signals and several vehicles. All seven of the aircraft passengers and several of the vehicle occupants were seriously injured; one passenger subsequently died of his injuries. The aircraft experienced extensive structural damage, with the wings and engines tearing off along the wreckage trail. There was a small post-crash fire in the right wing and engine area. This synopsis is based on the Transportation Safety Board of Canada (TSB) Final Report A02C0124.

The aircraft was fuelled to its maximum capacity at the company's base in Swan River, Manitoba, the night before the accident. The aircraft was then positioned in Winnipeg to fly a group to Gunisao Lake and return with another group. The positioning flight, which was flown by another company pilot, took 1 hr 38 min, and the aircraft was not refuelled after arrival in Winnipeg.

The pilot had about 3 000 hr of flight time, and had been a flying instructor prior to joining the company 16 months before the occurrence. He had flown many similar flights into Gunisao Lake and was aware that 100 LL aviation gasoline was



not available at that location. On the morning of the accident, he reported for duty at 04:20 and checked the weather; he noted that instrument meteorological conditions (IMC) existed at Winnipeg and for part of his route. He filed IFR flight plans from Winnipeg to Gunisao Lake and back. The alternate aerodrome that he filed for both flights was Island Lake, located about 258 NM north of Winnipeg.

During his pre-flight checks, he noted that the total fuel was approximately $\frac{3}{4}$ of the total capacity of the aircraft. He took seven passengers with baggage for the flight to Gunisao Lake, and did not complete weight and balance or fuel calculations on the operational flight plan and load control form provided in his company's Operations Manual (OM). Based on his belief that a full load of fuel would provide approximately five hours of flight time, he made a mental estimate that there was sufficient fuel to complete the round trip to Gunisao Lake. He estimated that the $\frac{3}{4}$ full tanks would allow him to return to Winnipeg with a fuel reserve of 50 min, and he did not refuel. *(These mathematical gymnastics on fuel calculations ultimately proved fatal for one passenger, and this practice is unfortunately too common in the air taxi industry...keep reading)*

AVIATION SAFETY LETTER

The pilot estimated the flight time from Winnipeg to Gunisao Lake on his operational flight plan as 1 hr 20 min. The actual aircraft flight time was approximately 1 hr 31 min. At Gunisao Lake, the seven passengers disembarked with their baggage and the pilot accepted six passengers and 450 lbs of baggage for the return flight. He once again failed to make any weight and balance or fuel calculations on the operational flight plan and load control form. The pilot estimated the flight time from Gunisao Lake to Winnipeg on his operational flight plan as 1 hr 20 min. The actual aircraft flight time from Gunisao Lake until the overshoot at Winnipeg was 1 hr 30 min.

When the pilot began the approach at Winnipeg, the reported weather for Winnipeg was as follows: winds 200° at 8 kt; ceiling overcast at 300 ft; visibility 1 SM in light drizzle and mist; altimeter setting 29.81 inches.

For flight planning purposes, the company used a fuel consumption figure of 240 pounds per hour (pph) for the first hour. This figure included a 30 pph allowance for taxi, takeoff and climb. For subsequent hours of flight the company used a consumption figure of 210 pph. The pilot had also noted that flight time to dry tanks was 4 hr 45 min. A review of the aircraft journey log and available refuelling records for five days prior to the accident permitted the determination of an average fuel usage of 225 pph for the occurrence aircraft.

Before the aircraft was on approach into Winnipeg, the right engine low fuel pressure light illuminated and the right engine sputtered. Fuel cross feed was selected. The right low fuel pressure light then went out and the engine returned to normal operation. The pilot did not declare an emergency or ask for assistance during the return flight to Winnipeg before executing the missed approach. *(It is unfortunately common practice for some pilots to delay declaring a fuel emergency until it is too late; while it may save their lives, pilots would rather risk death than*

face self-exposure to reckless planning and all the paperwork associated with declaring an emergency...keep reading)

The pilot flew the ILS Runway 13 at Winnipeg, recognizing that the fuel situation was critical and that engine power loss was imminent. He intentionally flew the aircraft well above the glide path for the ILS and at speeds significantly faster than normal, in order to have more time to respond to an engine power loss. The aircraft crossed the missed approach point well above the glide path. The pilot continued to descend past the missed approach point and was observed by tower controllers after breaking out of the cloud layer at about 200 ft AGL, with about 3 200 ft of runway remaining. *(The pilot knew he was in serious trouble at the missed approach point and that a successful missed approach was not in the cards; yet he did not declare an emergency because he still thought, at that moment, that he would actually get away with it...keep reading)*

The pilot was not in a position to safely land on the remaining runway and executed a missed approach, about 4 min prior to the crash. The pilot finally attempted to inform the controller during the missed approach that he had an urgent fuel problem; however, this critical information was not received by the controller. During the missed approach, the pilot switched the fuel selector from cross feed back to the main tanks in order to conserve the remaining fuel in the left tank for the left engine. The right engine then lost power and he feathered it. Approximately 3 min before the crash, the pilot advised the approach controller that he would like to expedite and return to the airport as soon as possible. Approximately 30 seconds later, the left engine lost power and the pilot transmitted a "Mayday" call. The aircraft was not in a position to return to any runway and the pilot executed the forced landing at the city intersection.

There were no pre-existing mechanical problems with the aircraft, and no indication of fuel leaking or venting. The operator's OM required that the

pilot-in-command of a Navajo aircraft on an IFR flight ensure that there is sufficient fuel to fly to the destination, execute an approach and a missed approach, and then fly to the alternate aerodrome and land with a reserve of 45 min. It also stated that all flights must be authorized by the Operations Manager or Chief Pilot and that a flight release will not be given until the pilot-in-command has completed an operational flight plan. However, company supervisory personnel indicate that, in practice, a flight release is not required and that a pilot self-dispatch system is used. The OM also requires that a weight and balance form be completed for each flight and signed by the pilot-in-command.

The *Canadian Aviation Regulations* (CARs) require that the aircraft be equipped with an autopilot for single-pilot IMC operations, but technical records indicated that the autopilot had been removed from the aircraft in April 2002, while the appropriate journey log entries to that effect had not been made. Company supervisory personnel were present and aware, as was the occurrence pilot, that the aircraft was not equipped with an autopilot and that one was required for single-pilot operations in the conditions of that morning.

Analysis—The pilot's pre-flight fuel estimate, which led to his conclusion that he would have 50 min of fuel on arrival in Winnipeg, was incorrect. The total flight time from Swan River to Winnipeg plus the flight plan estimates for the flight to Gunisao Lake and return was 4 hr and 18 min. These flights would have used 993 lbs of fuel using the company's guidance of 240 pph and 210 pph for the first and second hours respectively. This would have left a reserve of

99 lbs or 28 min of fuel, which was not sufficient for the flight to the filed alternate of Island Lake and the required hold time of 45 min.

The total actual flight time from the refuelling in Swan River until the pilot began the missed approach at Winnipeg was 4 hr 38 min. Since this included three separate flights, the calculation of the expected amount of fuel remaining on arrival at Winnipeg would be approximately 25 lbs or 6 min of fuel. The aircraft experienced a complete engine power loss 4 min later and, therefore, it is concluded that the power loss was a result of fuel exhaustion.

The pilot's decision to fly the ILS well above the glide path and at a higher-than-normal airspeed resulted in an ineffective approach from which a landing could not be made, although the reported weather at the time of the approach was better than the landing minima for the ILS to Runway 13. The pilot's decision to continue the approach well beyond the ILS missed approach point did not assure obstacle clearance while in proximity to the ground in cloud. His decision to modify the approach reduced, rather than increased, flight safety.

Although supervisory personnel were present when the pilot began his flight, none took any action when the pilot began his flight into IMC without an autopilot. The level of supervision that the company should have provided was not achieved on this series of flights, and company practices did not conform to the company OM regarding flight release.

Improper fuel management: sometimes you get away with it, sometimes you don't. —Ed