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NTSB Order No. EA-4696

UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD
at its office in Washington, D.C.
on the 28th day of August, 1998

JANE F. GARVEY, Administrator, Federal Aviation Administration, Complainant, v. GARY L. KNAPP, Respondent.	Docket SE-14980

OPINION AND ORDER

The respondent has appealed the initial decision and order of Chief Administrative Law Judge William E. Fowler, Jr., issued on February 3, 1998, at the conclusion of an evidentiary hearing. By that decision, the law judge affirmed, in part, the Administrator's amended order, suspending respondent's airline transport pilot (ATP) certificate on allegations of violations of Sections 91.103(a), 91.13(a), and 91.167(a) of the Federal Aviation Regulations (FAR), as a result of his taking off on a

flight with insufficient fuel, that resulted in a forced landing.[1] The law judge modified the sanction from 90 days to 30 days. The Administrator, who has filed a brief in reply urging the Board to affirm the law judge's initial decision, did not appeal the sanction modification. For the reasons that follow, respondent's appeal is denied.

On November 29, 1996, respondent rented a Piper PA-28-181

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[1]FAR §§ 91.103(a), 91.13(a), and 91.167(a) provide in pertinent part as follows:

> **§ 91.103 Preflight action.**
>
> Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include -
>
> (a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC....
>
> **§ 91.13 Careless or reckless operation.**
>
> (a) *Aircraft operations for the purpose of air navigation.* No person may operate an aircraft in a careless or reckless manner so as to endanger the life or property of another.
>
> **§ 91.167 Fuel requirements for flight in IFR conditions.**
>
> (a) Except as provided in paragraph (b) of this section, no person may operate a civil aircraft in IFR conditions unless it carries enough fuel (considering weather reports and forecasts and weather conditions) to-
> (1) Complete the flight to the first airport of intended landing;
> (2) Fly from that airport to the alternate airport; and
> (3) Fly after that for 45 minutes at normal cruising speed....

aircraft in order to transport himself, his wife, and his two children from Pittstown, New Jersey, to Turner Falls, Massachusetts.[2] The aircraft is equipped with two fuel tanks, each of which holds 25 gallons of fuel, or 50 gallons total, 48 of which are useable. The evidence shows that prior to departure respondent "topped off" the fuel tanks by adding 8.4 gallons of fuel. He visually checked the tanks to insure that they were both full. The trip to Turner Falls took 2 hours.

The next day, November 30, 1996, respondent and his family departed Turner Falls for the return trip to Pittstown. Respondent made a visual check of the fuel tanks, and he believed he had at least 30 gallons of fuel. Respondent testified that his observation was confirmed by the aircraft's fuel gauges. Respondent filed an IFR flight plan and obtained a weather briefing. He testified that he did not refuel the aircraft because he believed he had sufficient fuel for the return trip.

About 2 hours into the trip, respondent decided to divert to Allentown, Pennsylvania, because the head winds were stronger than had been forecast (40 knots rather than 10 knots). He testified that he was concerned that the trip was taking longer than expected, requiring more fuel. Respondent contacted air traffic control (ATC), stating that he was "not minimum," but that he wished to land to obtain fuel. According to both respondent and his wife, at this time the fuel gauges read that there were about 8 gallons in each tank, or one-quarter to one-

[2]Respondent is a captain for Continental Airlines.

third full. Two minutes later, the engine stopped. Respondent declared a "mayday" and advised ATC that "we're out of fuel." The aircraft crash landed. All of the occupants sustained injuries. It was dark and raining heavily, and rescue workers were not able to reach the crash site until the next morning. An FAA inspector did not arrive until the next day.

According to the investigating inspector, there were no signs of fuel in the aircraft or near the crash site, and no fuel stains on the fuselage or fuel odors in the area. He spoke with rescue workers who confirmed that they did not smell fuel when they arrived on scene. The investigator concluded that the aircraft had crashed because of fuel exhaustion. No tear-down of the aircraft engine was performed, nor, apparently, were other possible causes of the crash examined.

Respondent asserts that the law judge erred by affirming the allegations. He argues that another cause for the engine failure would have been discovered had the investigator not assumed it was a result of fuel exhaustion from the outset. Respondent argues, moreover, that "simple arithmetic" disproves the FAA's theory of fuel exhaustion. And, he argues, the fact that no fuel was found at the crash site proves nothing, because any fuel remaining would have been scattered over the crash area, washed away by the rain, or evaporated by the time the aircraft was found.

The Hobbs meter shows that the aircraft was operated by respondent for a total of 4.2 hours. According to respondent, he

had expected the return leg to take about 2.1 hours, based on the weather forecast. He added 20 minutes' time to reach an alternate airport, and 45 minutes of reserve, for a total of 3.1 hours. Respondent calculated that, operating at 65% power, he would use about 9 gallons of fuel per hour, requiring a total of 28.8 gallons. Since he had already operated the aircraft for 2 hours, he subtracted 18 gallons from 50 gallons and determined he should have had 32 gallons, or 30 gallons of available useable fuel. Thus, 30 gallons should have been more than enough to reach his destination safely. In support of his calculations, respondent and his aviation expert witness offered into evidence part of the aircraft's flight manual showing that at a 65% power setting, the aircraft endurance rate is 5.5 hours [8.7 gallons per hour]. Respondent's expert also calculated the actual burn rate for this aircraft, based on its fuel records, as 7.73 gallons per hour.[3] Finally, respondent notes, according to the engine performance portion of the flight manual, at 65% the fuel burn rate ranges from 7.6 to 9 gallons per hour.[4]

The Administrator's position is that, regardless of the amount of fuel respondent had when he departed on the first leg of the trip, he should have re-fueled the aircraft before departing on the return trip. According to the Administrator's expert witness, it would be very risky to "eyeball" the fuel

[3]The Administrator disputes the accuracy of these figures.

[4]At 75% power, the burn rate could be as high as 10.5 gallons per hour.

tanks or rely on the fuel gauges to insure sufficient fuel levels. The only way to establish whether these tanks have less than 34 gallons, according to this expert, is to measure the tanks with a calibrated dipstick. He explained that the tabs on each tank are at the 17-gallon mark, and therefore the fuel gauges are only able to accurately show if there are 17 gallons or more in each tank. Since respondent needed somewhere between 30 and 32 gallons total, he should never have departed with anything less than 34 gallons of fuel. The reasonable and prudent pilot would have filled the tanks up before departing on the second leg of the journey. The law judge agreed. We adopt the law judge's findings as our own.

Our difficulty with respondent's position is that, as the Administrator notes in his reply brief, the amount of fuel onboard on November 30th cannot be determined by looking exclusively at the events of the November 29th flight. In other words, the aircraft sat on the ground for an evening. We simply cannot tell whether the amount of fuel on board the aircraft when it landed in Massachusetts was the same amount of fuel on board when it took off the next day. Nor could respondent. Too many unknowns could have occurred during the interim.[5] The prudent pilot would not have assumed that, because he started with 50 gallons and flew 2 hours the day before, he would have 32 gallons when he started the engine up the next day, even if he used a

[5]Respondent notes in his appeal brief that he was using 100 octane fuel, "which has a tendency to evaporate when exposed to the air..." (Brief at 10).

conservative burn rate for his calculations. Moreover, respondent's reliance on Administrator v. Cody, 3 NTSB 3807 (1981), is misplaced. Two facts in that case distinguish it: (1) the second leg of the trip in Cody occurred on the same day as the first leg, and therefore it was not unreasonable for him to assume that the fuel levels remained unchanged; and (2) Cody used a dipstick to insure that the fuel levels had remained unchanged.

Finally, we reject respondent's contention that he performed a proper pre-flight inspection before the second leg. His fuel calculations assumed that he would encounter optimal conditions, and they left little or no room for error or unforeseen circumstances. As the facts bear out, respondent encountered stronger head winds than predicted and icing conditions that were not in the forecast. According to the Administrator's expert witness, he would have used a fuel burn rate of 10 gallons per hour for planning purposes. And, he opined, a reasonable pilot would not assume optimal conditions in calculating his fuel requirements. In sum, had respondent been prudent he would have topped off the tanks before departure. We agree with the law judge that a preponderance of the evidence shows that respondent's carelessness in calculating his fuel requirements resulted in a forced landing of his aircraft because of fuel exhaustion.

ACCORDINGLY, IT IS ORDERED THAT:

1. Respondent's appeal is denied;

2. The law judge's initial decision and order are affirmed; and

3. The 30-day suspension of respondent's ATP certificate shall begin 30 days from the date of service of this order.[6]

HALL, Chairman, FRANCIS, Vice Chairman, HAMMERSCHMIDT, GOGLIA, and BLACK, Members of the Board, concurred in the above opinion and order.

[6]For the purpose of this order, respondent must physically surrender his certificate to a representative of the Federal Aviation Administration pursuant to FAR § 61.19(f).