GCI Communication Corp's

Submission to the

National Transportation Safety Board

in the investigation of

de Havilland Canada DHC-3T Otter, N455A

Aleknagik, Alaska, August 9, 2010

NTSB Number ANC10MA068

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SECTION 1. INTRODUCTION

On August 9, 2010, at approximately 1442 Alaska daylight time (ADT), a de Havilland Canada DHC-3T aircraft registered as N455A impacted mountainous terrain about 10 miles northeast of Aleknagik, Alaska.

The aircraft was owned and operated by GCI Communication Corp. (GCI)[1] of Anchorage, Alaska. The pilot in command of the aircraft was Captain Theron ("Terry") Smith. In addition to the pilot, eight passengers were on board. The pilot and four passengers died at the scene, and four passengers were injured. The flight, which was conducted under 14 C.F.R. Part 91, originated at a GCI-owned fishing lodge ("GCI Lodge") on the southwest shoreline of Lake Nerka, and was en route to a remote sport fishing camp on the banks of the Nushagak River ("HRM fishing camp").

SECTION 2. FACTUAL INFORMATION

2.1 History of the Accident Flight

The accident flight departed from the GCI Lodge on Lake Nerka at 1427 ADT. The purpose of the flight was to transport eight passengers to the HRM fishing camp, which was located approximately 52 nautical miles southeast of the GCI Lodge. Operations Group Factual Report ("Oper. Fact."), pp. 2-3.

According to GCI Lodge personnel, on the morning of the accident, Captain Smith indicated that the flying conditions were not conducive for a flight to the HRM fishing camp. However, after lunch, at approximately 1400 ADT, Captain Smith informed the Lodge Coordinator that the weather had lifted and he was comfortable flying to the camp. Witnesses also observed Captain Smith checking the weather several times, including radar images on the Internet, prior to the aircraft's departure. Id., p. 2; Oper. Fact. Attach. 2, Record of Statement of Dr. Dani Bowman ("Bowman Stat."), p. 1.

The accident aircraft was equipped with a SkyConnect Satellite Tracking system, which collected aircraft location data approximately every three minutes. A review of the flight track data for the pilot's previous flights to the HRM fishing camp indicates that Captain Smith would typically travel down River Bay and over Lake Nerka to the end of the lake, then turn south/southeast towards a wide, flat valley between the Muklung Hills and Marsh Mountain known to local pilots as "the Flats."[2] Airworthiness Submission of Raw Flight Data for N455A from SkyConnect ("SkyConnect Data"); GCI Maps 1B & 2B; Oper. Fact. Attach. 6, Flight Track Maps of PIC 8/4-8/9 ("Oper. Fact. Attach. 6").

[1] GCI Communication Corp. provides facilities-based local and long distance voice, cable television, and data and Internet access to residential and business customers across Alaska.

[2] Terry Smith had flown the route between the GCI Lodge and the HRM fishing camp numerous times over the previous five days, had flown in the area previously, and was quite familiar with the area. Oper. Fact., pp. 11-12; Oper. Fact. Attach. 2, Statement of David Roseman ("Roseman Stat."), p. 3.

According to the SkyConnect data and witness statements, the accident flight took off towards the east, flew over Lake Nerka, and proceeded to travel along the northeast side of the lake. GCI Map 2B; SkyConnect Data; Oper. Fact. Attach. 6; Oper. Fact. Attach. 1, Record of Interview of Jim May ("May Int."), p. 3. The aircraft then turned south/southeast towards the Flats. SkyConnect Data; GCI Maps 1B & 2B; Oper. Fact. Attach. 6.

The last SkyConnect data point before the accident indicates that Captain Smith was on a heading that would have taken him almost exactly through the middle of the Flats. See blue course-line in GCI Map 2B; SkyConnect Data; Oper. Fact. Attach. 6. Additionally, when the Garmin 530 installed in the accident aircraft was powered up by the NTSB after the accident, it displayed the "Muklung" waypoint, which is located near the middle of the Flats. Airworthiness Group Chairman's Factual Report ("Air. Fact."), p. 52. A straight line from the last SkyConnect data point to the accident site shows a course of approximately 127 degrees, which is a deviation of over 35 degrees to the left of the course at the time of the last SkyConnect data point. The aircraft heading at the time of impact was 85 degrees, which is deviation of over 80 degrees to the left of the aircraft's course at the time of the last SkyConnect data point. See Aircraft Performance Study, p. 6.

According to one of the surviving passengers, during the 10-15 minute flight before the accident, the weather was not remarkable and the aircraft remained below the cloud ceiling.[3] Survival Factors Group Chairman's Factual Report of Investigation ("Survival Fact."), p. 14. The passenger further stated that the aircraft then made a left turn, went up a hill, and immediately impacted terrain. The passenger did not hear any change in engine sound before impact. He also did not perceive any change in the pitch attitude of the aircraft or any unusual maneuvering prior to impact. Id. Another passenger also indicated that he did not sense any indication of a problem with the flight before impact. Survival Fact., p. 9. He stated that there was no maneuvering, change in aircraft attitude, change in engine noise, discussion of a problem, expletives, or excited utterances prior to impact. Id.

The aircraft wreckage was found on the western slope of the Muklung Hills. The accident site was several miles to the left (east) of the pilot's normal route through the Flats, the valley between the Muklung Hills and Marsh Mountain. A topographic map shows the floor of the valley to be approximately 200 feet MSL. The elevation of the wreckage was approximately 900 feet MSL. Lake Nerka was visible from the wreckage, and the land between the lake and the accident site was relatively flat tundra. Air. Fact., pp. 3-4. The accident site was about 18 miles southeast of the GCI Lodge and 32 miles northwest of the HRM fishing camp. Oper. Fact., p. 4.

2.2 Injuries to Persons

The accident aircraft was carrying eight passengers and one crewmember. The pilot and four passengers were killed upon impact. The four remaining passengers survived the accident with injuries. Oper. Fact., p. 8; Survival Fact., pp. 4-6.

[3] One of the other passengers initially stated that he had no indication of the weather during the flight due to condensation on his window, and then changed his statement several months later to state that he could see only white out conditions from his window. Survival Fact., pp. 8-9. Another passenger stated that he could see "some" fog below the aircraft during flight but he could still see the water. Survival Fact., p. 11.

2.3 Pilot Information

2.3.1 Qualifications and Experience

The pilot in command, Captain Terry Smith, age 64, possessed extensive aviation experience and qualifications. He had degrees in aircraft maintenance technology and engineering,[4] and held an airline transport pilot rating for airplane multi-engine land, airplane multi-engine sea, and commercial privileges for airplane single-engine land, airplane single-engine sea, and glider. Oper. Fact., p. 9; Oper. Fact. Attach. 4, Conoco Phillips employment and training records. He possessed airline transport pilot-type ratings for Learjet, Boeing 737, and Grumman G-111 airplanes. Additionally, he held a flight instructor certificate for airplane single-engine land, airplane multi-engine land, and instrument airplane, as well as advanced and instrument ground instructor certificates. Captain Smith also possessed a flight engineer certificate for turbojet airplanes, and an airframe and powerplant mechanic certificate. Oper. Fact., p. 9.

Captain Smith was a lifelong resident of Alaska and well known and respected in the local aviation community. His father had managed the Fish and Wildlife Service for 40 years and regularly took his son on flights around the state for wildlife surveys and other purposes. They flew in Goose, Beaver, 180, and Cub aircraft. Thus, Captain Smith obtained exposure to, and experience with, aviation and bush flying in Alaska from an early age. Oper. Fact. Attach 1, Record of Interview of Terri Smith ("Smith Int."), pp. 3-4.

Captain Smith flew for ERA Helicopters and Aeroamb, Inc., before joining Alaska Airlines in 1979. Oper. Fact, p. 10. He was employed by Alaska Airlines from 1979 to 2007. During this time, Captain Smith was a Boeing 737 captain, instructor, check airman, and Federal Aviation Administration (FAA) designee. He was also the Anchorage, Alaska base chief pilot for Alaska Airlines from 1985 to 2007. Captain Smith's total flight time in the Boeing 737 was 17,950 hours. Id., p. 16.

Subsequently, Captain Smith was hired by Conoco Phillips Alaska as Manager Aviation-Alaska. Captain Smith held this position from February 2008 to July 2010. According to the current Conoco Phillips Manager Aviation-Alaska, William Weiss, Captain Smith initially joined the company in order to reorganize the aviation department and assist in adding the Boeing 737-700 aircraft to its fleet.[5] Mr. Weiss stated that once Captain Smith accomplished these goals, Captain Smith felt it was time to move on. Oper. Fact., p. 13.

Numerous witnesses have stated that Captain Smith possessed excellent flying skills and extensive aviation knowledge. Oper. Fact. Attach. 2, Hon Kinzie Statement for NTSB ("Kinzie Stat."), p. 1.; Smith Int., pp. 3-4; Oper. Fact. Attach. 1, Record of Interview of Ross Clement

[4] Captain Smith had a Bachelor of Science degree in Aircraft Maintenance Engineering and an Associate in Applied Science degree in Aircraft Maintenance Technology. Oper. Fact. Attach. 4 Conoco Phillips employment and training records.

[5] Captain Smith renewed his qualification on the 737 in 2008 and also served as a line pilot on the aircraft until he left the company. Clement Int., p. 2.

("Clement Int."), pp. 1-2; Oper. Fact. Attach. 1, Record of Interview of Virgil Peachey ("Peachey Int."), pp. 1-2; Oper. Fact. Attach. 1, Record of Interview of William Weiss ("Weiss Int."), p. 1. Witnesses described him as a calm and collected pilot who always operated in accordance with proper safety procedures. Kinzie Stat., p. 1. His emphasis on safety was well known.[6] According to a pilot who flew with Captain Smith at Alaska Airlines and Conoco Phillips, Captain Smith always stated "we are not going to go if it isn't good," and would not be pressured into an unsafe situation. Oper. Fact., p. 14. The pilot also indicated that Captain Smith "never flew below minimums" and would not deliberately fly into IFR conditions without clearance. Oper. Fact., pp. 14-15; Clement Int., p. 2. Another witness, who owns a local charter service, described Captain Smith as "totally safety conscious" and reported that he had taught FAA Medallion safety seminars. Oper. Fact. Attach. 1, Record of Interview of Jerry Ball ("Ball Int."), p. 1.

According to his wife, Terri Smith, and a childhood friend, Steve Dodge, both of whom are pilots, Captain Smith was a cautious pilot who was always thinking ahead of the airplane. He was "not stupid" and "not a cowboy," and would not be pressured into an unsafe situation. Smith Int., p. 3. Mrs. Smith also stated that her husband loved to attend and speak at aviation safety seminars.[7] Id. at 2.

As described more fully below, Terry Smith had thousands of hours in amphibious planes and flew extensively in Alaska. According to GCI employment records, as of July 19, 2010, Terry Smith had accrued 27,868 hours of flight experience, including 6,290 flight hours in multi-engine amphibious aircraft, 2,378 flight hours in single-engine amphibious aircraft, and 1,200 hours in the de Havilland DHC-2 and DHC-3. Oper. Fact., p. 9.

2.3.2 GCI Employment

The GCI Lodge is located approximately 320 miles southwest of Anchorage, Alaska in the Wood-Tikchik State Park. The park is about 40 miles wide and 70 miles long, and includes 15 major lakes. The town of Dillingham is located 30 miles south of the GCI Lodge. The Lodge is situated on the shore of the Agulowak River at Nerka Lake. Oper. Fact., p. 20.

The GCI Lodge includes guest facilities, staff quarters, and various workshops and storage buildings. Guest transportation is provided by GCI, or by scheduled air service between Anchorage and Dillingham and then from Dillingham to the Lodge in GCI's amphibious, float-equipped aircraft. Id.

The primary function of the DHC-3T Otter ("the Otter") was to transport guests to and from the GCI Lodge and support the functions of the Lodge. The aircraft operated from June 1 through October 15 each year. During this timeframe, the Otter would be based at the GCI Lodge. For the remainder of each year, the aircraft would be parked in Anchorage. The Otter did not operate in the winter. Oper. Fact., p. 21.

[6] For example, at his Conoco Phillips goodbye party, bright orange ties were distributed in recognition of Captain Smith's emphasis on safety. Oper. Fact., p. 14.

[7] This fact is reinforced by statements from GCI Chief Pilot Hon Kinzie and GCI pilot Virgil Peachey, who both reported that they heard Terry Smith speak at aviation safety seminars. Kinzie Stat., p. 1, Peachey Int., p. 1.

GCI had hired a pilot for the Otter at the beginning of the 2010 season, which would have run from mid-May to mid-October. However, this pilot departed unexpectedly in early July. GCI decided to hire three pilots for the remainder of the season. Id., p. 25. If GCI did not have pilots available for the Otter, or the Otter was unavailable, it would hire a local charter service to provide aircraft service for the Lodge. Kinzie Stat., p. 1.

Pilots at the GCI Lodge generally flew zero to three hours per day, depending on the presence of guests, Lodge needs and the weather. The Otter was used to fly guests and staff to and from the Dillingham airport, to fly in supplies for the Lodge, and to fly guests from the Lodge on fishing trips. The HRM fishing camp was a frequent destination. Id.

GCI pilots are paid regardless of whether or not they fly. The GCI Lodge also has a boat that can transport people and supplies. Thus, there is no incentive or need to fly in marginal weather. Pilots are clearly informed that they do not need to fly if they feel uncomfortable doing so on any given day, for weather or any other reason. GCI does not second guess its pilots' decisions not to fly; it supports them. Id., pp. 1-2.

Captain Smith accepted the position as a pilot at the GCI Lodge in July 2010, after retiring from Conoco Phillips. He was assigned pilot duties on the Otter, and was cleared to fly that aircraft as pilot-in-command on July 26, 2010.[8] Oper. Fact., p. 9.

According to Captain Kinzie, GCI personnel had been trying for many years to get Captain Smith to fly for them. However, due to his busy schedule, he was not able to do so. Captain Smith possessed extensive experience in Alaska in bush aircraft (meaning aircraft operated in remote areas, including amphibious, float-equipped aircraft) and was familiar with Garrett engines. Specifically, Captain Smith possessed substantial experience flying aircraft with Garrett Turbine Engines and the de Havilland DHC-2 Beaver, an aircraft similar to the Otter. He also owned and flew a Grumman Albatross, another amphibious aircraft, as well as a Cessna 185 equipped with floats. Oper. Fact. Attach. 1, Record of Interview of Hon Kinzie ("Kinzie Int."), p. 2.

On his application, Captain Smith reported the following flight times:

DHC-3 (Accident Aircraft make and model)	35
Single engine Amphib	2378
DHC-2	1215
Multiengine Amphib	6290
Instrument ME Amphib	975

Kinzie Int., p. 2.

Prior to assuming the duties of pilot-in-command of the Otter, Captain Smith wanted to observe the flight operations at the GCI Lodge in order to familiarize himself with the program.

[8]Captain Smith had previously flown for GCI in his Grumman Albatross. 2010 was the first year he flew the GCI Otter. Kinzie Stat., p 2.

Thus on July 26 and 28, 2010, Captain Smith flew the Otter with GCI pilot Virgil Peachey. During this time, Captain Smith logged 12 landings and flew to the HRM fishing camp. Id.; Smith Flight Logs. Mr. Peachey had no concerns with Captain Smith's performance. He stated that they practiced slow flight, approach to landing, steep turns left and right, flaps, and feather touch landings. He noted that Captain Smith performed smooth landings from the beginning. Peachey Int., p. 2-3.

On August 4, 2010, Captain Kinzie flew with Captain Smith in the accident aircraft. The flight included takeoffs, landings, and steep turns. Captain Kinzie was impressed with Captain Smith's ability to handle the aircraft and his "sharp skills" on both land and water. Oper. Fact., p. 11. Captain Kinzie informed Captain Smith about GCI's safety philosophy and policy that no pilot is required to fly when feeling uncomfortable. Captain Kinzie also confirmed that Captain Smith had a Dillingham airport badge and had met the Flight Service specialists. Captain Smith had planned to stay at the GCI Lodge until August 11, 2010, when another pilot would arrive and relieve him. Kinzie Int., p. 2.

2.3.3 Familiarity with Accident Location

According to numerous witnesses, Captain Smith was very familiar with the location where the accident occurred. Ball Int., p. 1; Oper. Fact. Attach. 1, Record of Interview of Marc [sic] Roseman ("Roseman Int."), p. 2; Kinzie Int., pp. 1-2; Smith Int., p. 3; Oper. Fact. Attach. 1, Record of Interview of Mark Phillips ("Phillips Int."), p. 3.

Captain Kinzie stated that Captain Smith had worked for the Office of Aircraft Services (now Aviation Management Directorate) in the Dillingham area. Kinzie Int., pp. 1-2. Moreover, when Captain Kinzie flew with Captain Smith, he demonstrated "very good familiarity" with the area and landmarks. Kinzie Stat., p. 1.

Mark Phillips, a professional pilot and longtime friend of Terry Smith, stated that he and Captain Smith had flown together in the accident area over a period of years, including flying Captain Smith's Albatross in and out of the area for GCI. According to Mr. Phillips, Captain Smith was very familiar with the local terrain, and had flown regularly into Lake Nerka for the past 8 to 9 years. Phillips Int., p.3.

Captain Smith's wife stated that her husband had a long history of flying in the accident area and would not have felt out of his element. She also indicated that he had flown for several nearby lodges and conducted bird surveys in the area. Smith Int., p. 3.

Flight track data for the accident aircraft from the days before the accident indicate that, during the 72 hour time frame preceding the accident, Captain Smith flew 15 flights in the area. Of these flights, six were either to or from the HRM fishing camp. Oper. Fact., pp. 16-18.

2.3.4 Recent Training

On March 12, 2010, Captain Smith successfully completed Boeing 737 recurrent training and pilot proficiency check. He was issued a Letter of Competency to perform the duties of

pilot-in-command pursuant to FAR 125.291. On March 28, 2010, he successfully completed Initial and Recurrent pilot testing.[9] Oper. Fact., p. 15.

Paul Kewin, the Director of Pilot Training for Conoco Phillips, administered Captain Smith's proficiency check on March 12, 2010. Mr. Kewin has stated that there were no issues during the check. He emphasized that Captain Smith was extremely experienced and had good situational awareness. With respect to situational awareness, Mr. Kewin noted that Captain Smith never had tunnel vision. He used the crew and knew "what was coming" and would be able to deal with it. Oper. Fact., pp. 13-14.

2.3.5 FAA Medical Certificate

At the time of the accident, Captain Smith held a current Second Class Airman Medical Certificate. The Certificate contained only one limitation, that the pilot was required to wear lenses to correct his vision.[10] Oper. Fact., p. 18.

2.3.6 Pilot Medical History – Stroke

On March 22, 2006, Captain Smith suffered a stroke.[11] Terry Smith Medical Records Information ("Medical Records"), p. 1. As a result, he lost his airman medical certificate. Phillips Int., p. 2. After the stroke, although he retained his position with Alaska Airlines, he no longer flew for the company. In 2008, Captain Smith retired from Alaska Airlines on a medical retirement. Clement Int., p. 2.

2.3.7 Captain Smith's Post-Stroke Flying

Witnesses who knew Captain Smith stated that he was fully recovered from his stroke within a year or so following the stroke. Captain Smith regained his FAA First Class Medical Certificate in April 2008.

According to Captain Smith's friend Mark Phillips, Captain Smith's symptoms were resolved within a year after the event. Phillips Int., p. 2. In the fall of 2009, Mr. Phillips flew with Captain Smith in his Albatross aircraft and noted that Captain Smith "handled it like his old self." Mr. Phillips again flew with Captain Smith two months before the accident and described his flying as "perfect." Phillips Int., p. 2.

Captain Smith's childhood friend, Steve Dodge, stated that he recovered completely from the stroke. Mr. Dodge flew with Captain Smith in his Albatross in the summer of 2008 after he regained his medical certificate. He is an Albatross-rated pilot and did not observe even a minor deviation in Captain Smith's flying. Mr. Dodge also stated that he spoke with Captain Smith on

[9] This is a written exam administered pursuant to FAR 125.287(a). Oper. Fact., p. 15.
[10] According to Mrs. Smith, Captain Smith wore progressive lens glasses at all times. He had both a clear pair of glasses and a shaded pair. He carried both pairs while flying. Oper. Fact. Addendum 2, p. 9.
[11] Specifically, Captain Smith suffered an intracerebral hemorrhage in the right basal ganglia. Medical Records, p. 1.

July 31, 2010, and at that time, he "sounded like Terry," and Mr. Dodge did not even think of the stroke. Smith Int., p. 2.

Andy Durett, an old friend of Captain Smith who flew for ConocoPhillips, also stated that when he recently flew with Captain Smith, during a 10-day time frame in July, 2010, he was "real sharp, totally normal, with an excellent recall memory." Mr. Durett further stated that during this time he flew with Captain Smith four times and he "always knew what to do." Oper. Fact. Attach. 1, Record of Interview of Andy Durett ("Durett Int."), p. 1.

Conoco Phillips pilot Ross Clement stated that he attended simulator training with Captain Smith in March, 2010. They also flew a line trip together on March 31, 2010. Captain Clement stated that Captain Smith's flying was perfect and his cues, communication skills, and landings were good. Captain Clement most recently saw Captain Smith on July 24, 2010 and stated that he looked fine. Clement Int., p. 2.

William Weiss, the Manager of Aviation for Conoco Phillips in Anchorage, stated that while Captain Smith was employed at Conoco Phillips, he performed like the pilot that he was before the stroke. Mr. Weiss also stated that he had not detected any difference in Captain Smith's recent behavior or alertness. Mr. Weiss concluded by stating that Captain Smith was deliberate in what he did and was in excellent health. Weiss Int., pp. 1-2.

According to Mrs. Smith, Captain Smith was in good condition and had not experienced any major changes to his health in the six months preceding the accident. She stated that he was very health conscious, ate well, and walked the dog for exercise. He did not drink coffee or smoke, and did not take Aspirin, Advil, or any prescription medications. He did drink an occasional glass of wine, but never drank excessively. Additionally, according to his wife, Captain Smith did not suffer from headaches or any other ailments. Mrs. Smith stated that Captain Smith had a photographic memory and "remarkable retention and recall." Smith Int., pp. 2-3.

Dr. Willis Simmons, the FAA Alaska Regional Flight Surgeon, stated that when he evaluated Captain Smith's application to regain his medical certificate, he was comfortable with the results he received from the evaluations Captain Smith had undergone, and noted that a reputable neurologist had not found any neurological deficits in the pilot. Record of Conversation with Dr. Willis M. Simmons, Jr. ("Simmons Int."), p. 2. Dr. Simmons restored Captain Smith's First Class Medical Certificate on April 9, 2008. Medical Records, p. 9.

On the day of the accident, Kevin O'Keefe, who was seated in the front right seat on the accident flight, stated that Captain Smith seemed friendly and alert. Oper. Fact. Attach. 1, Record of Interview of Kevin O'Keefe ("O'Keefe Int."), p. 1. He pointed to the altimeter in response to Mr. O'Keefe's question, described the intended route of flight and even pointed out one of the mountain ranges for sightseeing purposes. Id.

Thus, the witnesses who knew Captain Smith stated that he made a full recovery after the stroke, and those who flew with him in the days before the accident recalled his steady performance. None of the witnesses who interacted with Captain Smith at the GCI Lodge from

August 4-9, 2010 noticed anything unusual about Captain Smith's behavior or made any negative observations about his flying skills. To the contrary, all of the reports confirmed that Captain Smith was fully "on his game."

The guests at the GCI Lodge described Captain Smith as "cordial" and "friendly" and said that he liked to tell stories about his flying experiences. The witnesses described Captain Smith as a "really good" and "alert" pilot, who was "prudent," "cautious," "serious," and "businesslike." They said that he was always attentive to flying the airplane and did not "do any paperwork" while flying. They described his landings as "very smooth," "greased," and "perfect." Survival Fact., pp. 8-13; May Int., pp. 2-3; O'Keefe Int., p. 1.

However, after the accident two individuals indicated that, in the month preceding the accident, they had observed behavior and demeanor by Captain Smith at the same event that caused them concern. Norm Lagasse, the Director of the Alaska Aviation Heritage Museum, rode as a passenger/observer on a July 2, 2010 flight in the Museum's Grumman Widgeon piloted by Captain Smith, and stated that following clearance from the Lake Hood tower and upon taxiing into the water, the aircraft's wing-tip floats were retracted, and the right wing entered the water. Oper. Fact. Attach. 1, Record of Interview of Norm Lagasse ("Lagasse Int."), p. 1. He also stated that Captain Smith landed the aircraft with a tailwind, which Captain Smith did not note, and with high speed. The landing was successful. Id.

On July 4, 2010, Mr. Lagasse observed that Captain Smith attempted to start the engine of the same Widgeon, but was unable to get hydraulic pressure. Following three attempts to start the aircraft, a volunteer pointed out that he had not engaged the center magneto master button. The remaining flights of the day were uneventful, but Mr. Lagasse noted that the aircraft battery was dead the next morning and assumed that Captain Smith had not turned off the master switch for the aircraft the previous day. Id. at 2. Mr. Lagasse decided after the July 4, 2010 event that he would not allow Captain Smith to fly museum airplanes again until he completed corrective training. Id. at p. 2. He stated that Captain Smith's "stick and rudder skills were automatic, but his attention to details was not there," describing Captain Smith as sterile and flat. Id. at p. 2.

Ernest Mitchell, Chief of Maintenance at the museum, commented that when another volunteer gave Captain Smith the signal to start the engines for one of the July 4th flights and nothing happened, Mr. Mitchell came forward and looked in the cockpit. He observed Captain Smith staring forward, and then looking at Mr. Mitchell without speaking. Mr. Mitchell asked what was wrong, and Captain Smith stated that he could not get hydraulic pressure, and that the aircraft was not like the one he flew. Mr. Mitchell told him the hydraulic system was electric and suggested that he recycle the center fuel switch because it may be stuck. Captain Smith then started the aircraft. After Captain Smith took off, Mr. Mitchell expressed to Mr. Lagasse his concern that "something was not right with Terry." Oper. Fact. Addendum 2, pp. 5-6.

It bears noting that these impressions were not shared with Terry Smith prior to the accident. Mr. Lagasse reported, "Terry did not know that he was dropped from the museum flight list." Lagasse Int., p. 2.

With respect to Mr. Lagasse and Mr. Mitchell's observations, Captain Smith's wife stated that such behavior would be very uncharacteristic of her husband and that he had a tendency to pause to think before he spoke. Oper. Fact. Addendum 3, Telephone Interview of Terri Smith on March 24, 2011("3rd Smith Int."), p. 1. Mr. Bret Brown, an Air Traffic Controller at the Anchorage Air Route Traffic Control Center and close friend of Captain Smith, observed Captain Smith at the museum event on July 4, 2010. He indicated that Captain Smith's flying that day was "above the capabilities of most people." Oper. Fact. Addendum 3, Telephone Interview of Bret Brown on March 26, 2011 ("Brown Int."), pp. 1-2, 4. He also noted with respect to Mr. Mitchell's statement about Captain Smith's efforts to start the engine, that Captain Smith may have been trying to listen to see if the boost pump was coming or letting the starter cool off before cranking the engine again. Id. As for Mr. Lagasse's observations with respect to the July 2 flight, Mr. Brown indicated that there could be situations in which a pilot would deliberately operate with one float up and one down to clear the bank on shore, and that due to limited visibility around the aircraft when the floats are down, it may be prudent to delay lowering the float when bystanders are present. Regarding the tailwind landing, Mr. Brown stated that Captain Smith had advocated careful tailwind landings for proficiency. Brown Int., p. 5.

2.3.8 Post-accident Toxicology Report

The FAA performed a forensic toxicology analysis of specimens taken from the pilot in command. According to the analysis, no carbon monoxide, cyanide, or drugs were detected in the pilot's blood. Additionally, no ethanol was detected in the Vitreous. Oper. Fact., p. 18.

2.3.9 Post-Accident Neurological and Cardiological Studies

Following three autopsies and additional study by medical professionals, no definitive medical event at the time of accident has been identified. Medical Records, pp. 1-2. However, at least two doctors have indicated that Captain Smith suffered from medical incapacitation, either a neurologic or cardiac event.

The term *complex partial seizures*, originally defined by the International League Alliance on Epilepsy (ILAE) in 1981, are indicated by impairment in consciousness, which implies decreased responsiveness and awareness of one's self and surroundings. Medscape Reference Article 1183962 (http://emedicine.medscape.com/article/1183962-overview.) During a complex partial seizure, a patient is usually unresponsive and does not remember events that occurred, consciousness may not be impaired completely. Id. Typically, patients do not respond to external stimuli but may make simple verbal responses, follow simple commands, or continue to perform simple or, less commonly, complex motor behaviors such as operating a car. Id. The causes of complex partial seizures include vascular malformations, stroke, and inheritable conditions. Id. Dr. Maria Aguilar, M.D., an assistant professor at the Mayo Clinic Arizona, based on a review of then-available records, concluded that such a seizure was consistent with the description of the accident, and that Captain Smith experienced a seizure.[12]

[12] Letter from Dr. Maria Aguilar, Mayo Clinic Arizona, Dept. of Neurology, to Malcolm Brenner, NTSB, dated February 24, 2011.

Cardiac abnormalities were also identified in two of the three autopsies performed.[13] The first autopsy found "ballooning and thickening of the mitral valve with underlying subendocardial fibrosis." Medical Records at 1, 16. Forensic Pathologist Donald R Rogers, M.D., observed small intra-myocardial vessels showing fibromuscular hyperplasia. Medical Records, p. 17. Fibromuscular hyperplasia within the myocardium has previously been implicated in arrhythmia, which can lead to medical incapacitation.

2.4 Weather Information

At 1422 ADT, the Automated Weather Observing System ("AWOS") at the Dillingham Airport (DLG), located about 20 miles south/southwest from the accident site, indicated wind from 170 degrees at 10 knots, with gusts to 17 knots, visibility 3 miles, light rain, mist, scattered clouds at 800 feet above ground level (AGL), overcast clouds at 1300 feet AGL, temperature 11 degrees Celsius (C), dew point 9 degrees C and altimeter setting of 29.57 inches of Mercury. Oper. Fact., p. 20.

At 1455, the DLG AWOS indicated wind from 180 degrees at 12 knots, with gusts to 23 knots, visibility 3 miles, light rain, mist, scattered clouds at 600 feet AGL, overcast clouds at 1000 feet AGL, temperature 11 degrees C, dew point 9 degrees C, and altimeter setting 29.57 inches of Mercury. Remarks indicated clouds were scattered to broken. Id.

No SIGMETs were in effect near the accident area for the time frame in which the accident occurred. Meteorological Factual Report ("Meteor. Fact."), p. 29.

The weather conditions near the accident site around the time of the accident were personally observed by GCI President Ron Duncan and his wife, Dr. Dani Bowman. Mr. Duncan stated that, according to his GPS data, they passed within 14 nautical miles of the crash site at 1507. At that time, although there were rain squalls in the area, the ceilings were good and the weather in the direction of the accident site appeared "very flyable." Mr. Duncan indicated that the weather during their flight was turbulent, "but it was all good VFR." The visibility ranged from 5 to 30 miles. The ceilings that they observed ranged from 600 feet to high scattered along the upper range of their flight. Mr. Duncan did not observe any location where lowered ceilings or reduced visibility could not have been easily circumnavigated. Other than the turbulence, Mr. Duncan considered it a good flying day. Oper. Fact. Attach. 2, Ron Duncan Statement ("Duncan Stat."), p. 1. Dr. Bowman stated that the visibility was good, while observing some rain and low clouds. Bowman Int., p. 1.

At 1330 on the day of the accident, another pilot flew along the east edge of lower Lake Nerka and over the ridge between Marsh Mountain and Table Mountain, just north of Aleknagik, into Dillingham and estimated that there was a 600 foot ceiling with 5-7 miles visibility, and 10-15 mile an hour winds from the Southwest. The pilot departed from Dillingham on his return flight at 1415. He stated that the "weather was the same or even better" at that time. Meteor. Fact., Attach. 3, Letter from Bud Hodson to NTSB ("Hodson Ltr."), p. 1; Oper. Fact. Attach. 1, Record of Interview of Fredrick "Bud" Hodson ("Hodson Int."), p. 1.

[13] The third autopsy by the Armed Forces Institute of Pathology did not include similar observations.

The GCI Lodge manager stated that, when the aircraft took off, he could see all of Jackknife Mountain, which he indicated is 2100 feet high. It was mostly cloudy but there were some blue patches in the sky. It was also somewhat windy, but visibility was good with a broken sky at about 2000 feet. The Lodge manager said he could easily see 3 miles across the lake. Roseman Stat., p. 2.

Other witnesses also stated that River Bay and the far end of the lake were visible at the time the aircraft took off. May Int., p. 3; Oper. Fact. Attach. 1, Record of Interview of Gregory Chapados ("Chapados Int."), p. 3. The cloud layer was reportedly covering the top 25% of the mountain peaks across the River Bay from the GCI Lodge. Oper. Fact. Attach. 2, Record of Statement of Gregory Chapados ("Chapados Stat."), p. 2.

One of the surviving passengers described the visibility during the accident flight as "fine." He stated that it was cloudy above, with light turbulence. He indicated that they did not fly into the clouds, they stayed below them. Oper. Fact., p. 5. Another passenger also stated that the pilot stayed below the cloud ceiling. Survival Fact., p. 14.

Another passenger indicated that "some" fog was present beneath the aircraft but he could still see water below. He did not think the aircraft flew into any clouds while taking off, but he did notice clouds, fog, and condensation on the windows" early in the flight. Survival Fact., p. 11.

Lastly, one of the other passengers initially stated that he had no indication of the weather during the flight due to condensation on his window. However, he modified his statement in November 2010, and indicated that once airborne, he could see only white-out conditions outside the aircraft. Survival Fact., pp. 8-9.

SECTION 3. ANALYSIS

3.1 There is No Evidence that the Accident Aircraft Experienced Preimpact Structural, Engine, or System Failures.

3.1.1 The Aircraft Engine was Developing Power at the Time of Impact.

According to the NTSB, its examination of the accident aircraft's engine and propeller indicated that there were no preexisting failures or discrepancies that would preclude normal operation of the engine or propeller prior to impact. Powerplant Group Chairman's Factual Report ("Powerplant. Fact."), p. 2.

3.1.2 The Aircraft Flight Controls were Working Properly at the Time of Impact.

According to the NTSB, its examination of the aircraft wreckage did not reveal any failures or discrepancies in the aircraft's wing and tail control surfaces prior to impact.

3.2 The Pilot In Command Most Likely Suffered a Medical Impairment During the Flight Immediately Prior to the Accident.

3.2.1 Captain Smith was a Well-Qualified, Safety-Conscious, Experienced Bush Pilot.

Captain Smith was a lifelong Alaska resident and an extremely knowledgeable and experienced bush pilot. He had extensive experience flying bush aircraft in Alaska and was quite familiar with the terrain surrounding the accident site. This is demonstrated by his impressive credentials and the statements of numerous witnesses regarding his flying skills, emphasis on safety, and knowledge of flying in Alaska.

Captain Smith had almost 28,000 flight hours and held an Airline Transport Pilot Rating. He had extensive experience flying float planes in Alaska, including over 8,500 hours in amphibious aircraft and over 1,200 hours in de Havilland DHC-2 (Beaver) and DHC-3 (Otter) aircraft. Oper. Fact., p. 9. He gained experience bush flying in Alaska at an early age when he joined his father, who was the manager for the Fish and Wildlife Service, on flights around the state. Smith Int., pp. 3-4.

Numerous witnesses have stated that Captain Smith possessed excellent flying skills and extensive aviation knowledge, including observations by those who flew with him during the days and weeks preceding the accident, as well as on the day of the accident. He was described as a calm and collected pilot who always operated in accordance with proper safety procedures. Kinzie Stat., p. 1. His wife, and a longtime friend, Steve Dodge, both of whom are pilots, stated that Captain Smith was a cautious pilot who was always thinking ahead of the airplane. Smith Int., p. 3.

Captain Smith's emphasis on safety was well known. He would never be pressured into an unsafe situation, "never flew below minimums" and would not deliberately fly into IFR conditions without clearance. Oper. Fact., pp. 14-15; Clement Int., p. 2. He was "totally safety conscious" and even taught FAA Medallion safety seminars. Ball Int., p. 1.

3.2.2 Captain Smith was Familiar with the Accident Area and his Intended Route of Flight.

Numerous witnesses stated that Captain Smith was very familiar with the location where the accident occurred. Ball Int., p. 1; Roseman Int., p. 2; Kinzie Int., pp. 1-2; Smith Int., p. 3; Phillips Int., p. 3. Chief Pilot Hon Kinzie stated that Captain Smith used to work for the Office of Aircraft Services (now Aviation Management Directorate) in the Dillingham area. When Captain Kinzie flew with Captain Smith, Captain Smith demonstrated "very good familiarity" with the area and landmarks. Kinzie Int., pp. 1-2; Kinzie Stat., p. 1.

Mark Phillips, a professional pilot and longtime friend of Terry Smith, stated that he and Captain Smith had flown together in the accident area over a period of years, including flying Captain Smith's Albatross in and out of the area for GCI. According to Mr. Phillips, Captain

Smith was very familiar with the local terrain, and had flown regularly into Lake Nerka for the past 8 to 9 years. Phillips Int., p.3.

Flight track data for the accident aircraft from the days before the accident indicate that, during the 72-hour time frame preceding the accident, Captain Smith flew 15 flights in the area of the GCI Lodge. Of these flights, six were either to or from the HRM fishing camp. Oper. Fact., pp. 16-18. On each prior trip from the GCI Lodge to the HRM fishing camp, except when ceilings and visibility were unrestricted, Captain Smith flew through a wide valley (just over three miles wide) between the Muklung Hills and Marsh Mountain. See GCI Map 1B, below.

3.2.3 Visual Meteorological Conditions Prevailed at the Time of the Accident.

Weather data from observation systems in the area and witness accounts indicate that visibility was relatively good in the accident area around the time of the accident. Visibilities were five miles or better and ceilings were in excess of 600 feet above ground level. Several pilots chose to fly in the vicinity of the accident site before, during and after the time the accident flight was in the air.

At 1422 and 1455 ADT, Dillingham Airport, which is approximately 20 miles south/southwest of the accident site, reported visibility of three miles, light rain, mist, scattered clouds at 600-800 feet above ground level (AGL), and overcast clouds at 1000-1300 feet AGL. Oper. Fact., p. 20.

Ron Duncan and his wife found the weather conditions sufficient to take their plane out shortly after the accident flight had departed. In fact, according to GPS data from their trip, they passed within 14 nautical miles of the crash site at 1507, which is approximately 40 minutes after the accident flight departed. Mr. Duncan indicated that the weather was "all good VFR" with visibility from 5 to 30 miles and ceilings from 600 feet to high scattered. There was no weather that could not have been "easily circumnavigated," and the weather in the direction of the accident site appeared to be "very flyable." Duncan Stat., p. 1.

At 1330, another pilot, Bud Hodson, flew along the east edge of lower Lake Nerka and over the ridge between Marsh Mountain and Table Mountain, into Dillingham, and estimated that there was a 600 foot ceiling with 5-7 miles visibility. Mr. Hodson departed from Dillingham on his return flight at 1415, and stated that the "weather was the same or even better" at that time, which was approximately 12 minutes prior to the accident flight departing. Hodson Ltr., p. 1; Hodson Int., p. 1.

According to the GCI Lodge manager, when the accident aircraft took off, he could see all of Jackknife Mountain, which he indicated was 2100 feet high and is located approximately five miles south of Lake Nerka. It was mostly cloudy, but there were some blue patches in the sky. He said he could easily see 3 miles across Lake Nerka. Roseman Stat., p. 2.

Other witnesses also stated that River Bay and the far end of Lake Nerka were visible from the GCI Lodge at the time the accident aircraft took off. May Int., p. 3; Chapados Int., p. 3.

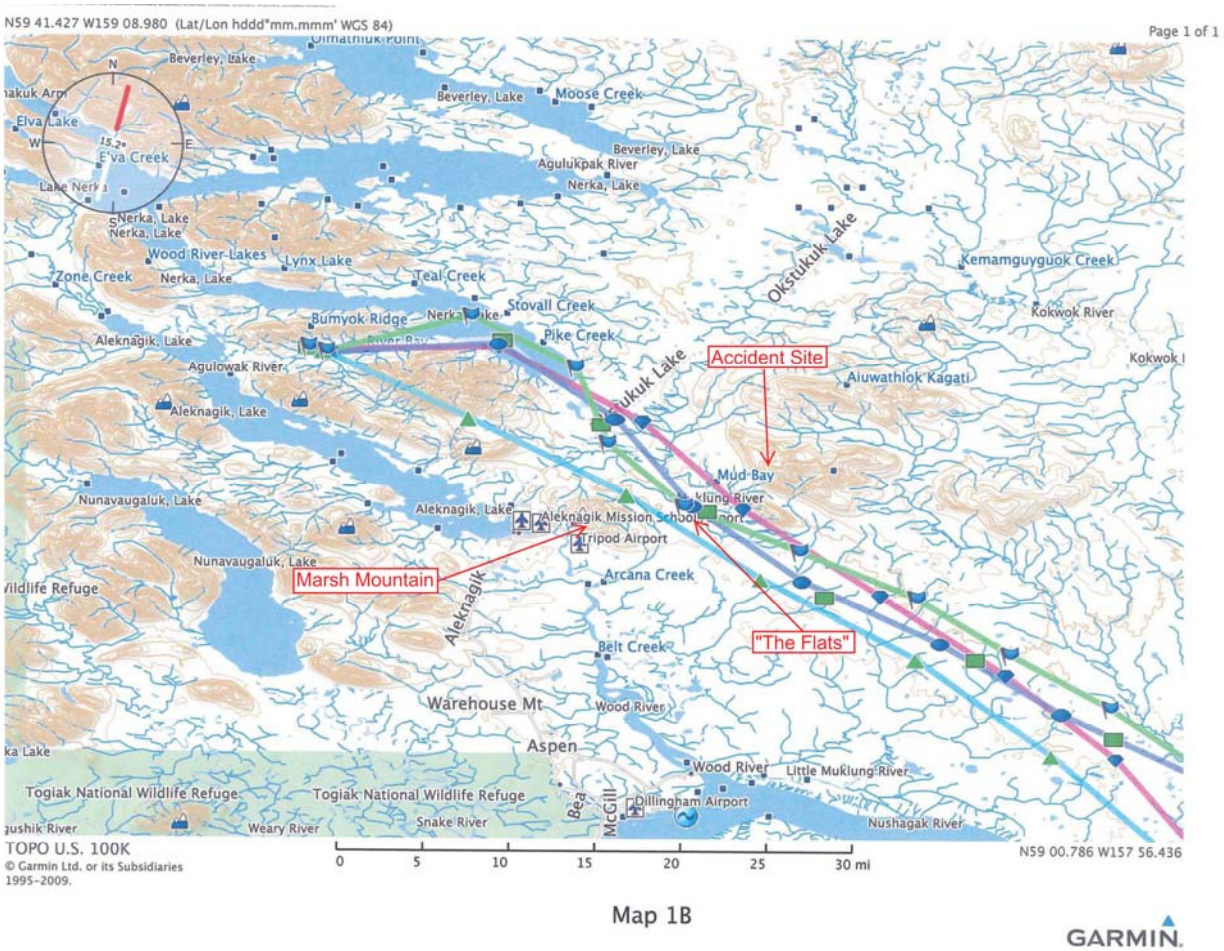
The cloud layer was reportedly covering the top 25% of the mountain peaks across the River Bay from the Lodge. Chapados Stat., p. 2.

One of the surviving passengers described the visibility during the accident flight as "fine." He stated that it was cloudy above, with light turbulence. He indicated that they did not fly into the clouds, they stayed below them. Oper. Fact., p. 5. Another passenger also stated that the pilot stayed below the cloud ceiling. Survival Fact., p. 14.

3.2.4 There was A Significant Deviation from the Proper and Apparently-Intended Route of Flight.

The aircraft flight track data suggest that the accident flight was on course until approximately three minutes before impact. At that point, the aircraft inexplicably made a significant deviation from the proper and apparently-intended course and crashed into known mountainous terrain more than three miles from the apparent intended course of the aircraft.

On each prior trip from the GCI Lodge to the HRM fishing camp, except when ceilings and visibility were unrestricted, Captain Smith flew through the Flats, a wide valley between the Muklung Hills and Marsh Mountain that is just over three miles wide. GCI Map 1B, below. This is confirmed by SkyConnect Satellite Tracking data for Captain Smith's previous flights to the HRM fishing camp. Those data show that he would typically travel down River Bay and over Lake Nerka until the end of the lake, then turn south/southeast toward the Flats. SkyConnect Data; GCI Map 1B, below.

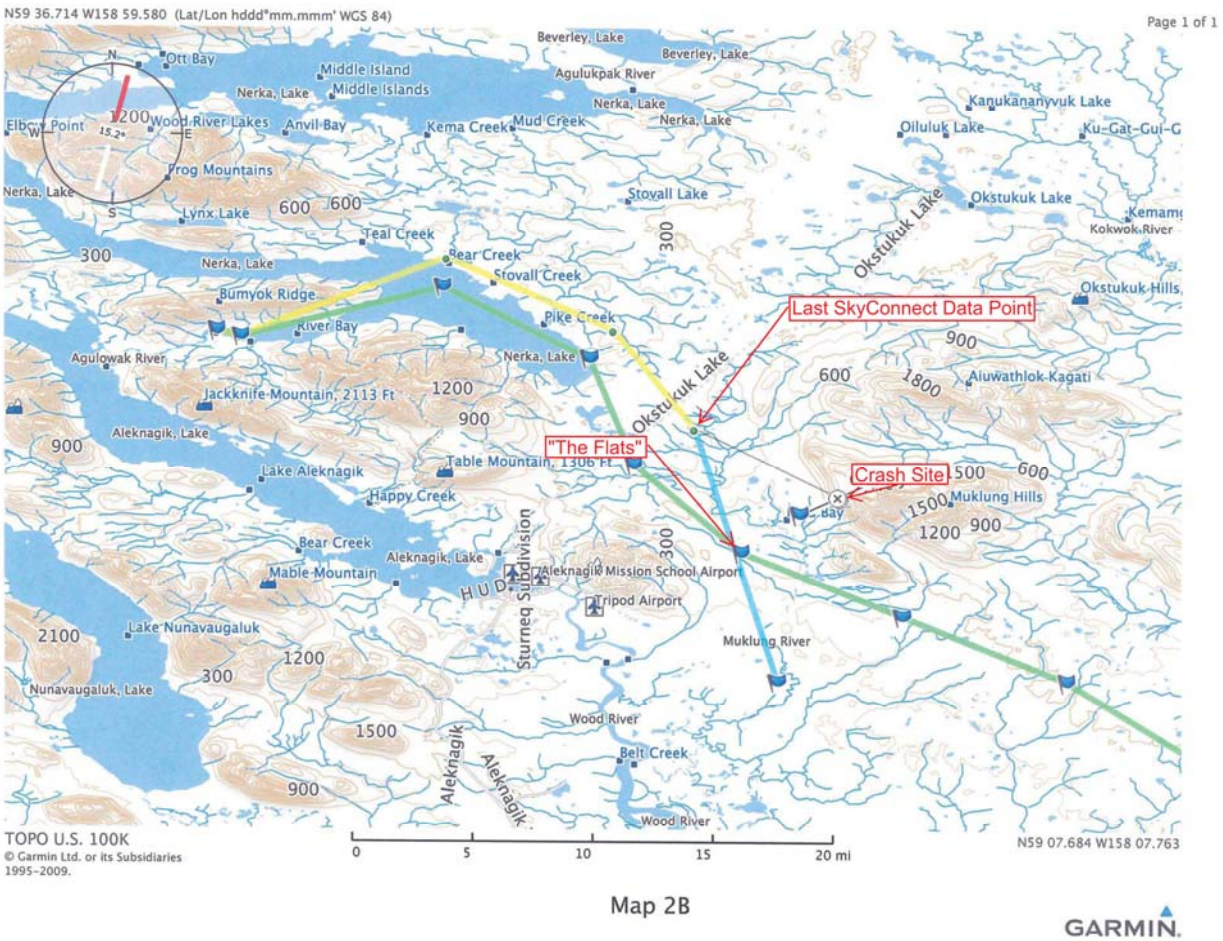


Map 1B

GCI MAP 1B – Captain Smith's Recent Flights from the GCI Lodge to HRM Fish Camp

On the day of the accident, Captain Smith took off towards the east, flew over Lake Nerka, and proceeded to travel along the northeast side of the lake, where the passengers would have experienced a smoother flight. See yellow course-line in GCI Map 2B; SkyConnect Data; Oper. Fact. Attach. 6; May Int., p. 3.

Captain Smith then picked up his typical route and turned south/southeast towards the center of the Flats. The last SkyConnect data point collected before the accident indicates that Captain Smith was on a 168 degree course, heading directly for a spot midway between the Muklung Hills and Marsh Mountain, almost exactly through the middle of the Flats. See blue course-line in GCI Map2B; SkyConnect Data; Oper. Fact. Attach. 6. Additionally, when the Garmin 530 installed in the accident aircraft was powered up by the NTSB after the accident, it displayed the "Muklung" waypoint, located near the middle of the Flats. Air. Fact., p. 52. Thus, had Captain Smith flown to the displayed waypoint, he would have traveled through the middle of the Flats.



GCI Map 2B - Accident flight path in yellow, last known heading (as reported by SkyConnect) in blue, direct line from last SkyConnect data point to crash site in black, Earlier flight from GCI Lodge to HRM fish camp in green.

The wreckage was found on the western slope of the Muklung Hills. A straight line from the last SkyConnect data point to the accident site shows a course of 127 degrees true (112 degrees magnetic), a deviation of 41 degrees to the left of the course at the time of the last SkyConnect data point. The aircraft heading at the time of impact was 85.1 degrees, a change of over 80 degrees to the left of the aircraft's course at the time of the last SkyConnect data point. See Aircraft Performance Study, p. 6.

Figure A9.2 from the NTSB Aircraft Performance Study provides a "pilot's eye view" of the aircraft heading at the last SkyConnect data point as well as the locations of the accident site and Captain Smith's prior routes to the HRM fishing camp:

Figure A9.2: N455A simulation scenario 2 (target MUKLG).

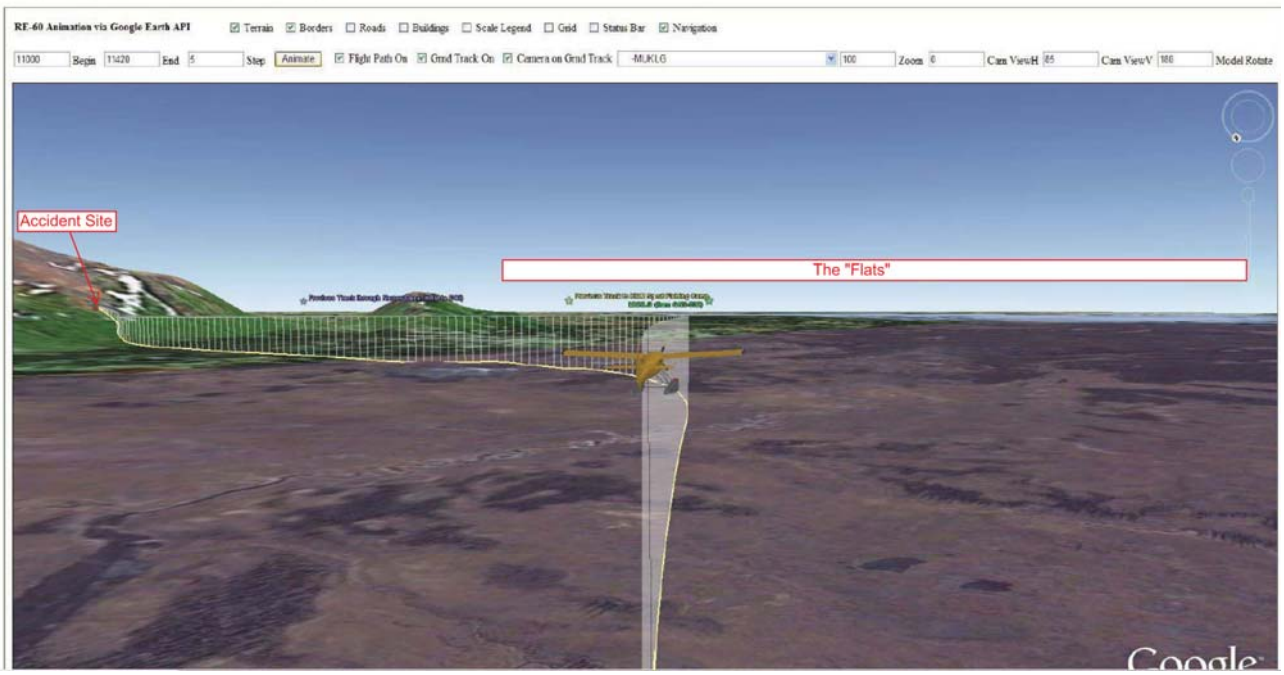


Figure A9.2 from Aircraft Performance Study (annotations added)

The accident site was at an elevation of approximately 900 feet MSL, just over 700 feet above the elevations of the Flats. Oper. Fact., p. 4. This would be an expected altitude at which to fly through the Flats given the reported cloud ceilings near the accident site.

3.2.5 It is Unreasonable to Believe that Captain Smith Simply Flew into the Terrain.

Captain Smith was a highly-experienced bush pilot with demonstrated abilities and a strong safety orientation. He was very familiar with the area and had flown the route between the GCI Lodge and the HRM fishing camp multiple times over the several days prior to the accident. The terrain in the area was relatively simple to understand and visualize.

The passenger seated in the right front seat on the accident flight stated that Captain Smith seemed friendly and alert during the flight and pointed out one of the mountain ranges for sightseeing purposes. O'Keefe Int., p. 1.

The visibility at the time of the accident was more than adequate for the planned trip, as shown by area weather reports and the statements of other pilots who also chose to fly in the immediate area just before and after Captain Smith departed.

Statements by other experienced bush pilots underscore that Captain Smith would not have mistakenly flown into the area of the accident site hills, given his awareness of the presence of the Muklung Hills, a very well known feature.

Mark Phillips, a professional pilot and longtime friend of Captain Smith, was stunned by the location of the accident and did not understand why Captain Smith would ever have turned to the east or why the aircraft was pointed so far to the left of the proper course. Phillips Int., p. 3.

GCI pilot Virgil Peachey also stated that there was no reason for Captain Smith to fly near the accident site hills given the weather at the time. In such weather conditions, Captain Smith should have been flying through the lowest area (the Flats). Peachey Int., p.4.

Jerry Ball, the Director of Operations for a local charter service, adamantly stated that Captain Smith "absolutely, absolutely" knew that there was terrain to his left in the accident area and would not have flown to the location of the accident under the weather conditions prevailing at the time.

Even if Captain Smith had encountered weather, he would not have turned the aircraft toward mountainous terrain that was well known to him. He had broad room to maneuver in the Flats and had instruments he would have relied on in the event of an inadvertent encounter with Instrument Meteorological Conditions. There is no logical explanation for this deviation, except medical impairment of the pilot.

3.2.6 Captain Smith Most Likely Suffered Medical Impairment while Operating the Accident Aircraft.

The facts demonstrate that Captain Smith most likely suffered from medical impairment immediately prior to the accident. At the most basic level, it is highly unlikely that Captain Smith would have controlled his aircraft into the terrain given his vast experience as a bush pilot, his familiarity with the terrain and the visual meteorological conditions that prevailed at the time of the accident. Captain Smith was "on his game" until approximately three minutes before the accident. He had communicated with his passengers during the flight and was on course when the aircraft started to drift significantly off-course in the direction of well-known mountainous terrain and crashed.

The exact cause of Captain Smith's incapacitation is currently unknown to GCI. Medical experts have proposed a couple of different causes of the medical impairment. The Mayo Clinic indicated that pilot incapacitation would be consistent with a complex partial seizure, which was consistent with the pilot's medical history and would explain the accident. Nor do the findings rule out the possibility that abnormalities in Captain Smith's myocardium observed by Dr. Rogers could have led to a disruptive arrhythmia.

Of course, neither of these hypotheses has been confirmed by any of the medical findings, and it is possible that Captain Smith suffered some other type of medical incapacitation. Even if the exact cause of incapacitation cannot be conclusively demonstrated, that does nothing to diminish its likelihood. Based on the current record, the possible explanations are either controlled flight into terrain or some sort of medical impairment. The overwhelming evidence of Captain Smith's unparalleled Alaska piloting experience, safety record, and post-stroke return to flying form makes it highly unlikely that he controlled his aircraft into the terrain. Accordingly, the same overwhelming evidence compels the conclusion that Captain Smith suffered a medical impairment that allowed the aircraft to veer off a familiar, practiced course into mountainous terrain.

SECTION 4. CONCLUSIONS

4.1 Findings

1 The airplane was properly certified, equipped, and maintained in accordance with Federal regulations.

2 The pilot in command was properly certificated and qualified in accordance with applicable Federal regulations.

3 The pilot in command was an experienced and accomplished pilot with extensive experience flying in amphibious aircraft in Alaska.

4 The pilot in command was known for his photographic memory of terrain and his situational awareness while flying.

5 The pilot in command was known for his strong safety orientation.

6 The pilot in command was familiar with the terrain in the area of the accident.

7 The pilot in command had safely flown the intended route of flight in the accident aircraft six times in the 72 hours preceding the accident.

8 The pilot in command had safely flown 15 flights in the area of the accident in the 72 hours preceding the accident.

9 The pilot in command suffered an intracerebral hemorrhage (stroke) in 2006.

10 The pilot in command appears to have recovered fully from his stroke.

11 The pilot in command was issued a First Class Airman Medical Certificate in April 2008, which was last renewed in December 2009.

12 The pilot in command was communicating with his passengers during the accident flight, including pointing out terrain features as points of interest.

13 The last known course of the accident aircraft was directly toward the middle of a very broad valley between the Muklung Hills and Marsh Mountain, known to local pilots as “the Flats.”

14 Upon powering up the unit, the Garmin 530 GPS from the accident aircraft displayed the “Muklung” waypoint, which is located in the middle of the Flats.

15 There was significant deviation from the proper and apparently intended course in the minutes immediately prior to the accident.

16 Visual meteorological conditions existed at the time and place of the accident.

17 Even in the highly unlikely event of an encounter with adverse weather, contrary to all available facts, the pilot in command had ample room to maneuver, along with the availability of, and training necessary to rely on, instruments.

18 Even in the highly unlikely event of an encounter with adverse weather, contrary to all available facts, it is very unlikely that the pilot in command would have purposefully turned the aircraft toward known mountainous terrain.

19 The accident aircraft impacted the terrain at an altitude of approximately 900 feet MSL, which is approximately 700 feet above the elevation of “the Flats” and is consistent with a safe and proper altitude given the reported cloud ceilings in the area.

20 It is very unlikely that the pilot in command controlled the accident aircraft into the terrain given the weather conditions, his experience, his familiarity with the terrain, and the known course of the accident aircraft shortly before the accident.

21 The pilot in command most likely suffered from medical impairment at the time of the accident.

4.2 Probable Cause

The probable cause of this accident was the medical impairment of the pilot in command shortly before the accident, which resulted in the aircraft departing from its intended course and impacting the terrain.