



National Transportation Safety Board Aviation Accident Final Report

Location:	Stockton, UT	Accident Number:	WPR09GA216
Date & Time:	04/25/2009, 1004 MDT	Registration:	N442NA
Aircraft:	LOCKHEED P2V-7	Aircraft Damage:	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	Injuries:	3 Fatal
Flight Conducted Under:	Public Aircraft		

Analysis

The multi-engine fire bomber, which was not carrying retardant, was established at its cruise altitude while en route to a fire base where it would be used as part of the effort to fight a local fire. While en route, the flight crew encountered a forecast area of instrument meteorological conditions, whereupon they began a series of descents to lower altitudes in order to stay in visual flight rules (VFR) conditions beneath the clouds. During the last few minutes of their flight, the flight crew had descended to an altitude that was less than 1,300 feet above ground level (agl) over nearly level terrain. As they approached rapidly rising terrain at the end of the broad open valley they had been flying over, they inadvertently entered instrument meteorological conditions (IMC). Soon thereafter, while still in a nearly wings-level attitude, the airplane impacted a ridge about 240 feet below its top. The First Officer, who was flying at the time, had asked the Captain about ten minutes prior to the impact if their altitude was high enough to clear the upcoming terrain, but the Captain did not respond, and the First Officer did not challenge the Captain about the issue. Witnesses in the area reported low clouds with ceilings about 200 feet above ground level with a visibility of one-quarter mile or less, with rain and fog. One of the witnesses reported momentarily viewing the airplane flying "very low," while the others reported only being able to hear the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flight crew's failure to maintain terrain clearance during low altitude flight in low ceiling and visibility conditions. Contributing to the accident was the flight crew's failure to adequately monitor their location with respect to the rising terrain environment ahead, and, their lack of crew resource management communication as a crew.

Findings

Aircraft	Altitude - Not attained/maintained (Cause)
Personnel issues	Monitoring environment - Flight crew (Factor) Lack of communication - Flight crew (Factor)
Environmental issues	Mountainous/hilly terrain - Contributed to outcome Low ceiling - Effect on operation Low visibility - Effect on operation

Factual Information

HISTORY OF FLIGHT

On April 25, 2009, about 1004 mountain daylight time (MDT), a Lockheed P2V-7 Neptune, N442NA, impacted the terrain about one and one-half mile north of Stockton, Utah. The two airline transport pilots and their passenger were killed in the accident, and the airplane was substantially damaged by the impact sequence. The airplane was owned and operated by Neptune Aviation Services, and dispatched as the result of the issuance of a Resource Order (Aircraft) issued by the National Interagency Coordination Center (NICC). The Title 14 Code of Federal Regulations Part 91 Public Use repositioning flight, which departed Missoula, Montana, about two hours prior to the accident, was en route to Alamogordo, New Mexico. At the time of the accident, the airplane was flying in an area of low ceilings and restricted visibility. No flight plan had been filed with the Federal Aviation Administration, but a company flight plan was on file with NICC.

According to United States Department of Agriculture Forest Service (USDAFS) records, Neptune P2V-7, N442NA (designated Tanker 42), along with its assigned crew, began its yearly Mandatory Availability Period (MAP) under the 2009 National Exclusive Use Airtanker Service Contract (Contract # AG-024B-C-08-9279) on 15 April, 2009. At that time the airplane was assigned to the Missoula Airtanker Base at Missoula International Airport, Missoula, Montana, but was physically located on the ramp adjacent to Neptune Aviation Services on the northeast side of Missoula International Airport. The airplane and crew were assigned to the Klamath Falls, Oregon, Administrative Base for contract management oversight only. The airplane and crew were assigned a basic coverage schedule of six days ON and one day OFF (Monday), with a nine-hour per day Standby period, with the potential of an additional government-assigned extended standby, not to exceed 14 hours total standby per day. During the 160-day MAP Tanker 42 was to be made available for the exclusive use of the government, and although assigned to a specific Administrative Base, was to be available and capable of being dispatched nationwide.

On April 22, 2009, while on Standby at the Missoula Airtanker Base, Tanker 42 was launched under the authority of Resource Order MT-LNF-19, issued by the National Interagency Coordination Center (NICC), in order to fight the Obrien Creek Fire located about five miles west of Missoula International Airport. The crew flew three sorties that day, with a total elapsed time of 1.10 hours.

On April 23 and April 24 the airplane and crew did not fly. On April 24, about 1730 MDT, Neptune Aviation Services was notified via telephone by NICC that a Resource Order was being issued to dispatch Tanker 42 on an empty (not carrying retardant) repositioning flight to the Alamogordo Airtanker Base in Alamogordo, New Mexico. That phone call was followed up by a faxed copy of Resource Order NM-N5S-000198. According to the Resource Order, upon arriving in Alamogordo, the firefighting sorties of Tanker 42 were to be assigned/launched under the authority of the New Mexico Area Dispatch Center (NM-ADC), an Expanded Dispatch, for the purposes of fighting the Four Mile Fire, which was located about eight miles southeast of Dunken, New Mexico.

At 2140 MDT on April 24, 2009, the Tanker 42 First Officer attempted to file a VFR flight plan using the Direct Users Access Terminal (DUAT) system. The flight plan route that he input into the DUAT system was from Missoula, Montana (KMSO), to Pocatello, Idaho (KPIH), to Grand

Junction, Colorado (KGJT), to Albuquerque, New Mexico (KABQ), to Alamogordo, New Mexico (KALM), at a filed altitude of 13,500 feet. The flight plan was rejected by the DUAT system, because the DUAT system did not recognize the aircraft type/special equipment entry of Lockheed P2G, and the session ended.

The next morning (April 25), at 0601, the First Officer of Tanker 42 contacted the Federal Aviation Administration's Automated Flight Service Station (AFSS) to obtain a weather briefing. At that time he indicated the flight would be "IFR" (conducted under Instrument Flight Rules), and that the route of flight for which he needed weather was from Missoula, Montana (KMSO), to Alamogordo, New Mexico (KALM), by way of Cedar City, Utah (KCDC), and Albuquerque, New Mexico (KABQ). While he was on the phone with the AFSS briefer, the First Officer also successfully entered the DUAT system at 0605 in order to acquire a "Plain Low Altitude Weather Briefing."

The AFSS briefer provided the synopsis, and indicated that AIRMETs for icing conditions extended over northern Utah from the freezing level to 20,000 feet and an AIRMET for mountain obscuration was current for the region. After providing the weather conditions en route, the briefer asked the First Officer what levels he wanted the winds aloft data for, and the First Officer indicated for 12,000 and 18,000 feet. The AFSS briefer asked again if the First Officer planned on going VFR or IFR, and the First Officer responded with, "...we're filed for IFR". They then discussed in general terms the low pressure system and associated front that was stalled over the area and discussed the radar echoes in the vicinity of Salt Lake City. The co-pilot acknowledged he knew about the echoes, and indicated he had observed them on the TV. The briefer reviewed the NOTAMs (Notice to Airmen) for the region, and the briefing concluded at 0623 MDT.

The routing selected by the First Officer for the DUAT briefing was through Pocatello, Idaho (KPIH), to Grand Junction, Colorado (KGJT), to Albuquerque, New Mexico (KABQ), then to Alamogordo, New Mexico (KALM), at 13,500 feet. That briefing also included the full series of AIRMETs for IFR and mountain obscuration, moderate turbulence below 15,000 feet, and icing conditions over the area. No METARs or TAFs for Utah were included in the DUAT briefing due to the selected routing specified. The only other weather data provided besides the AIRMETs that extended over Utah was the winds and temperature aloft forecast (FD) for Salt Lake City. The forecast data for Salt Lake City at 6,000 feet was wind from 220° at 22 knot with a temperature of +5° C. At 9,000 feet wind from 220° at 24 knots and -3° C. At 12,000 feet from 230° at 38 knots at -17° C, and at 18,000 feet from 240° at 52 knots at -29° C. The document also included 5 1/2 pages of NOTAMs.

The First Officer did not file an FAA flight plan during either the AFSS session or the DUAT session, and there was no record of a VFR or IFR FAA flight plan for N442NA on file on the day of the flight (April 25, 2009).

The flight departed Missoula International Airport at 0803 on April 25. According to recorded data recovered from the onboard automatic flight following (AFF) system and the Garmin global positioning system (GPS) unit, after the initial VFR departure, the crew climbed to the southeast. About 0814, when the airplane was approximately 10 miles east of Stevensville, Montana, the crew leveled off at 11,500 feet mean sea level (MSL). At that time the data indicated that the crew turned slightly right, and maintained headings between 160 and 172 degrees until approximately 0932. About 0932, when the airplane was about four miles west of Malad City, Idaho, and about 12 miles north of the Idaho/Utah border, the crew turned right to

a heading of about 180 degrees, while remaining at 11,500 feet. About four minutes later, when the airplane was about four miles south of the Idaho/Utah border, the crew turned further right to about 190 degrees, and began to descend out of 11,500 feet. About four minutes after that (around 0940), while descending through about 7,600 feet MSL, the crew turned further right to a heading of about 220 degrees, and they contacted the next sector of Salt Lake Air Route Traffic Control Center (ARTCC), from whom they were receiving VFR traffic advisories. According to ARTCC audio recordings, at that time the crew of Tanker 42 advised Salt Lake Center that they were departing 11,500 feet in order to "remain VFR." In response, Salt Lake Center advised Tanker 42 to "maintain VFR," and then gave them the current Salt Lake altimeter setting of 29.78. Then about 0942, while descending through about 7,500 feet, the crew turned further right to about 240 degrees.

About 0947, on the same frequency that Tanker 42 was on, the Salt Lake Center controller advised a Delta Airlines flight to expect light mixed icing and light turbulence during the arrival procedure for Salt Lake International Airport. Immediately following that transmission, the Salt Lake Center controller handed Tanker 42 off to the next sector controller by advising them to contact Salt Lake Center on 128.55. Tanker 42 acknowledged that call, and then contacted the next sector controller, advising him that Tanker 42 was "level 6,500." About one minute after Tanker 42 made contact with the new sector, that sector controller began the process of handing Tanker 42 off to the next sector (Lake 641). During the pre-handoff discussion, the current controller advised the Lake 641 controller that, "We've got a Tanker 42. He is VFR. It looks like he is trying to skirt some weather. He's just at the Gunnison gate now at 6,500."

The receiving controller advised the handoff controller that that airspace was actually controlled by a different controller (Heart Sector 41), so the handoff controller contacted the Heart 41 controller to start the handoff process again. During the initial briefing with the Heart 41 controller, the handoff controller stated that Tanker 42 was just on the sector boundary, and was VFR at 6,500 feet. He then said that, "It looks like he is trying to pick his way through that weather." He then asked the receiving controller if he would be able to "...see him out there." The Heart 41 controller asked where Tanker 42 "was going," and the handoff controller said, "He's trying to go down towards Albuquerque." The Heart 41 controller responded that he probably would not be able to see Tanker 42 for about 20 to 30 miles, and the handoff controller then asked if he (the Heart 41 controller) wanted him to just terminate Tanker 42 for now. The Heart 41 controller then said that would be fine.

About 0950, the handoff controller advised Tanker 42 that "Radar service is terminated," because Salt Lake Approach would not be able to "see you" for about 20 miles. The controller then advised Tanker 42 to attempt to contact Salt Lake Approach in about 20 miles on frequency 124.9, and advised Tanker 42 to, "...squawk VFR now." The controller then further stated that Salt Lake Approach would give Tanker 42 a new transponder code after they made contact. Tanker 42's acknowledgment of that transmission was the last known contact with any FAA in-flight resource or controller.

At the time of this last transmission, the crew had turned back to the left to a heading of about 165 degrees, and the airplane was over the middle of The Great Salt Lake, about 30 miles west of Ogden, Utah, and level at about 6,500 feet. About two minutes later, the airplane was down to about 6,000 feet (about 1,800 feet above the surface of the lake), and it stayed near that altitude until reaching the south end of the lake about 0959. By the time the airplane was about five miles south of the lake, near Grantsville, Utah, the crew had descended to about 5,800 feet,

which was about 1,400 feet above ground level (agl), and turned left about 10 degrees. By 10:02:40, the airplane was about six and one-half miles west of Tooele, Utah, down to about 5,670 feet, heading about 141 degrees, at an airspeed of 208 knots. According to recorded data from onboard accelerometers, within about six seconds after crossing over State Highway 38 (and the railroad tracks that run parallel to it), at almost exactly 10:04, the airplane impacted the grassy northwest 20-degree upslope of a 5,867 foot-high ridge at an elevation of about 5,630 feet.

LOCALIZED WEATHER

The NWS National Surface Analysis Chart for 0900 MDT depicted a low pressure system with a central pressure of 1001-hectopascals (hPa) over southwestern Utah with a cold front extending southward and a warm to stationary front extending east-northeastward across northern Utah immediately south of the accident site into northwestern Colorado to another low pressure center at 1000-hPa.

The closest weather reporting facility was at Bolinder Field - Tooele Valley Airport (KTVY), which is located about seven and one-half miles north of the accident site, at an elevation of 4,321 feet msl (about 1,310 feet lower than the point of impact). The 0955 recorded Automated Weather Observation System (AWOS-3) for KTVY (about 10 minutes before the accident) indicated wind from 330° at 9 knots, visibility 10 miles in moderate drizzle, ceiling broken at 1,500 feet, overcast at 1,900 feet, both temperature and dew point at 6° Celsius, and an altimeter setting of 29.80 inches of Mercury.

The KTVY weather observation at 1055 MDT, about 50 minutes after the accident, reported wind from 330° at 12 knots, visibility 4 miles in mist, scattered clouds at 800 feet, ceiling broken at 1,300 feet, broken at 2,000 feet, with both temperature and dew point at 5° Celsius, and an altimeter setting of 29.81 inches of Mercury.

There were three witnesses located within one mile of the accident site who heard the airplane just prior to the impact. One witness had a momentary view of the airplane, and described it as flying "very low" from the northwest to the southeast. All of the witnesses reported low clouds with ceilings about 200 feet above the ground at their respective locations (all were at an elevation that put them about between 430 to 480 feet lower than the initial impact site). All three witnesses reported or described a visibility of one-quarter mile or less, with rain and fog. Although all of the witnesses could clearly see the accident site from their respective locations once the ceiling had risen later in the day, none of them could see it at the time of the accident. The two witnesses who heard the impact, and looked in the direction where the noise came from, were not able to see the glow of the post-crash fire.

The Sheriff's deputies who responded to the emergency calls said that the area where they gathered on Highway 38 (about 430 feet below the accident site) was obscured by low clouds and horizontal visibilities down to 200 feet. The Sheriff further indicated that because of the limited visibility, it took his crew more than three hours to find the wreckage, even though it was located about one-half mile from the highway and witnesses were able to point in the direction where it was ultimately found.

One of the witnesses, who was working at a landfill located about seven-tenth of a mile northwest of the impact site, noted that to the west of where he was working, in the general direction of the lower flat terrain where the airplane came from, the clouds were a little higher and the visibility was unlimited.

PERSONNEL DATA

The Pilot-In-Command (Captain), age 66, held an Airline Transport Pilot certificate for airplane multi-engine land, and a second class airman medical issued February 17, 2009, with the limitation that he shall wear glasses for near vision while exercising the privileges of his certificate. According to the operator's records, the Captain had accumulated about 7,335 hours of flying time, 916 of which was in the Neptune P2V. Of his total hours, 5,155 were in multi-engine airplanes, and 2,227 were in single-engine airplanes. He held an instrument rating for airplanes, and had logged 150 hours of simulated instrument time, and 396 hours of actual instrument time. In the 90 days prior to the accident, he had accumulated nine hours of flying time in airplanes, all of which were in the Neptune P2V. The Captains last FAR Part 61.58 proficiency check ride was successfully completed on February 8, 2009, and his Neptune Aviation Services ground training was successfully completed on February 27, 2009. His most recent United States Department of Agriculture Forest Service Pilot Qualification and Approval Record was dated February 28, 2009. He completed the Crew Resource Management Skills portion of his 2009 Recurrent Training on February 26, 2009, and the Terrain Avoidance portion of his 2009 Recurrent Training on February 25, 2009. He also completed an instrument procedures, emergency procedures, and Cockpit Resource Management simulator flight/debriefing in a level D multi-engine airplane simulator on January 22 and 23, 2009.

The First Officer, age 60, held an Airline Transport Pilot certificate for multi-engine airplane land, and a second class airman medical certificate issued on March 9, 2009, with the limitation that he shall wear glasses for near vision while exercising the privileges of his certificate. According to the operator's records, the First Officer had accumulated about 15,075 hours of flying time, 350 of which were in the Neptune P2V. Of his total hours, 8,400 were in multi-engine airplanes, and 4,054 were in single-engine airplanes. He held an instrument rating for airplanes, and had logged 90 hours of simulated instrument time, and 170 hours of actual instrument time. In the 90 days prior to the accident, the first officer accumulated nine hours of flying time in airplanes, all of which were in the Neptune P2V. His last FAR Part 61.55 second-in-command check ride was successfully completed on February 21, 2009, and his Neptune Aviation Services ground training was successfully completed on February 27, 2009. His most recent United States Department of Agriculture Forest Service Pilot Qualification and Approval Record was dated February 28, 2009. He completed the Crew Resource Management Skills portion of his 2009 Recurrent Training on February 23, 2009, and the Terrain Avoidance portion of his 2009 Recurrent Training on February 25, 2009. He also completed an instrument procedures, emergency procedures, and Cockpit Resource Management simulator flight/debriefing in a level D multi-engine airplane simulator on January 21, 2009.

AIRCRAFT INFORMATION

The airplane was a Lockheed Neptune P2V-7, serial number 150283, manufactured in 1962. The Work Order signing off the last A, B, C, and D Phase Inspections of the FAA approved AAIP was dated February 1, 2009 (Work Order # T-42-135). As part of that Work Order, the airplane also underwent the following:

1. Eddy current and visual inspections of all lower wing fuel access panels and doublers in accordance with AMOC ASS-SSR-08-009 to Airworthiness Directive 2002-19-13.
2. A landing gear rigging inspection and adjustment in accordance with NAVIAR 01-75-EEB-2-4 maintenance manual.

3. A test of altimeters, transponders, and encoder in accordance with FAR 91.411, 91.413, and FAR Part 43 appendix E and F.
4. A continued Airworthiness inspection in accordance with Avenger Aircraft Services P2V-5 Instructions AAS-ICA-05-001 Revision B and AAS-ICA-08-001 Revision A.
5. The installation of new forward jet pod fittings in accordance with Supplemental Type Certificate #ST9710AT-T.
6. The completion of the Neptune Aviation Services avionics inspection procedure supplement. [Note: The airplane was inspected and certified for flight under instrument flight rules per FAR part 91.205 (d).]
7. Completion of the Neptune aviation Services post-maintenance checks and ground performance run check sheet.

The work order annotation recorded an airframe total time of 3525.2 hours, and an airframe total cycle count of 850. There were 88 non-routine work cards completed as part of the work order process, and the airplane was then determined to be in airworthy condition and approved for return to service. A review of the daily maintenance logs revealed that the last ground VOR (Very High Frequency Omni-directional Radio Range) check was performed at Missoula, Montana, on April 15, 2009, with both VOR's showing an error of plus one degree.

The airplane had last flown on April 22, 2009, three days prior to the accident, at which time it accumulated a total of 1.1 hours during a total of three sorties. On that day there were three discrepancies entered on the airplane's Discrepancy Card MF-4. One entry noted that the number one reciprocating engine was running rich during ground operations. The second entry noted the same rich running condition on the number two reciprocating engine. The third entry noted that the number two reciprocating engine had a low idle rpm (600 rpm). The over-rich condition was corrected by adjusting the carburetor mixture per NAVWEPS 01-75EEB-2-7, paragraph 3-13, and the low idle was corrected by adjusting the carburetor idle speed as per NAVWEPS 01-75EEB-2-7 paragraph 3-12. The airplane was then returned to service.

A further review of the airplane's records, and a discussion with Neptune Aviation Services maintenance personnel determined that since the time that it had been converted to a fire bomber, the airplane did not have any de-icing or anti-icing capabilities associated with its flight surface's, but its propeller's were still equipped with de-ice capability.

WRECKAGE AND IMPACT INFORMATION

The initial impact point was located on a smooth grassy 20-degree northwest-facing upslope, at an elevation of about 5,630 feet, slightly less than one-half mile southeast of where the airplane crossed Utah State Highway 38. The initial impact point consisted of five ground scars in the rocky soil, which was aligned in a nearly horizontal plain. The center scar was about six feet wide, nine feet long, and about four to eight inches deep. The two outboard scars, which were about 49 feet apart, and similar in shape and size, were about four feet wide, nine feet long, and approximately 18 inches deep at their centers. On each side of the center scar, and approximately equidistant between the center scar and the outboard scars where two similar round-shaped ground scars that measured about thirty-six inches across, and about eight inches deep. Just upslope of the center scar of the initial impact point were pieces of the retardant tank fairing, the retardant tank filler neck, a retardant tank door hinge, and the remains of the number six and number four retardant tank doors. Just upslope of both round-

shaped ground scars were three equally spaced clearly defined ground scars about four inches wide and about five feet long.

From the initial impact point, the impact track continued up the 20-degree slope on a magnetic heading of about 138 degrees, for about 200 feet, at which point the upslope increased to about 30 degrees. From that point, the main wreckage swath continued about another 270 feet, with the main airframe wreckage coming to rest just below the top of the ridge, about 465 feet from the initial impact point. Both the terrain and most of the components scattered along the 30-degree upslope showed evidence of thermal damage from a post-crash fire. Although the majority of the airplane's structure was scattered as wreckage along the upslope from the initial impact point to the main wreckage, a small number of structural and component pieces, mostly associated with wing structure or engine systems, were found on top of the ridge to the southeast of the main wreckage. The most distant wreckage was the left wing from station 276 outboard, and the power section of both reciprocating engines. The wing section was located near the center of a rocky ravine about 900 feet from the point of initial impact on a magnetic heading of 140 degrees. The right engine came to rest about 200 feet down the ravine from the wing section, and the left engine came to rest about 37 feet further down the ravine from the right engine. That ravine itself was perpendicular to and southeast of the airplane's primary debris path (see Wreckage Location List and Wreckage Location Photo for identification and location of individual wreckage items).

Due to extensive thermal damage and high-energy mechanical impact damage to almost all pieces of the wreckage, control continuity, elevator position, rudder and rudder trim position, and aileron trim tab position could not be determined. The position of the number one mechanical drive actuator of the varicam panel (horizontal trim panel) was compared to an operational airplane, and determined to be in the one degree nose down position. Both wing spoiler actuating tubes were found in the fully extended position, which is consistent with the spoilers being in the stowed position. Measurement of a first inboard flap drive nut determined that it was approximately four inches from the face of the actuator, which when compared to the flap drive nut at the same location on an operational airplane indicated a position of two degrees flaps down. The fuel valves for both jet engines, which are located in the wing trailing edge, were identified and found to be in the closed position, which is consistent with the jet engine throttles being in the OFF position. In addition, inspection of both jet engines revealed that there was no evidence of compressor blade leading edge damage, turbine blade chipping or fracturing, or any indication of circumferential blade tip rubbing. Both reciprocating engines showed extensive impact damage, with system components located both along the upslope impact path and on the rocky terrain where they ultimately came to rest. The three propeller blade slash marks observed immediately uphill from both round-shaped ground scars, which were determined to be associated with the impact of the armored chin cowl of the respective reciprocating engines, were measured and determined to be 64 inches apart for both engines. The propeller hubs had been torn from their shafts, and all but one of the propeller blades had separated from their respective hub at their root. All of the propeller blades showed leading edge indentations, and gouging, and some degree of chord-wise scarring. In addition to the indentations and gouging, most of the blades showed massive leading edge crushing along their entire span, with the leading edge being pushed back into the body of the blade between two to four inches. Some of the blades showed longitudinal twisting while others did not. Some of the blades were bent in a forward arc, while others were relatively straight or bent abruptly at mid-span. Many had been torn open at a number of locations along their trailing edge.

The main wreckage, all of which suffered extensive thermal damage, consisted primarily of the remains of the fuselage, from just forward of the wing leading edge to just forward of the empennage section; a portion of the right wing, to include the right flap and the right engine accessory section; the left wing root; the throttle quadrant; the left main landing gear; and the remains of the center instrument panel. The instruments that were able to be read included the right engine torque gauge (0 pounds), the left cylinder head temperature gauge (180 degrees), the left carburetor temperature gauge (0 degrees), the varicam position indicator (4 degrees airplane nose up), the left engine cowl flap position indicator (closed/faired), and the right engine cowl flap position indicator (off scale beyond the closed/faired position).

At the completion of the on-scene inspection of the wreckage, no evidence had been found that would indicate the airplane had experienced an anomaly or malfunction related either to its ability to produce engine power, or to its ability to be controlled by the flight crew's manipulation of its flight control system.

MEDICAL AND PATHOLOGICAL INFORMATION

The Utah State Medical Examiner's Office performed autopsies on both flight crew members. The examining M.D. determined that the manner of death for both individuals was accidental. The official autopsy report for the First Officer listed the immediate cause of death as blunt force injuries to head, torso, and extremities due to an airplane crash. The official autopsy report for the Captain listed the immediate cause of death as conflagration injuries due to an airplane crash. The State of Utah toxicology results for both individuals were negative.

The FAA's Civil Aeromedical Institute (CAMI) performed a partial forensic toxicology examination on samples taken from the Captain. The results for all portions of the examination performed were negative. Although the FAA provided the Utah State Medical Examiner's Office a toxicology kit for the purpose of collecting samples from the First Officer for forwarding to CAMI, no such samples were taken.

DISPATCH OF TANKER 42

Tanker 42 was dispatched to Alamogordo, New Mexico, to be used in the suppression of the Four Mile Fire, which was centered about 21 miles southwest of Hope, New Mexico. The sequence of events that ultimately lead to the dispatch of Tanker 42 was initiated on April 24, when the Southwest Interagency Coordination Center (SWCC), a Geographic Area Coordination Center (GACC), asked Alamogordo Interagency Dispatch Center if they needed a fourth air tanker for fighting the Four Mile Fire. This offer was able to be made because the initiation of the Exclusive Use Air Tanker Contract on April 15, 2009, made tankers from other geographic areas, which were not yet assigned to a specific fire, potentially available. Alamogordo Interagency Dispatch relayed this question/offer to the Bureau of Land Management (BLM) Air Attack that was airborne over the Four Mile Fire, and the Air Attack responded with, "We'll take whatever you can give us." Alamogordo Dispatch then passed the request for a fourth air tanker to SWCC, and since there were no tanker resources available locally, SWCC then placed an order to the National Interagency Coordination Center (NICC) via the Resource Order Status System (ROSS). [Note: Normally a tanker requests from an on-scene Air Attack would be passed through the Incident Commander (IC) and/or the Operations Office, but due to communication difficulties and a misunderstanding as to the extent of the authority delegated to the aforementioned Air Attack, this part of the process did not take place.] When the request arrived at NICC, the dispatcher determined which tankers were

available, and then considered the distance to Alamogordo for each tanker, and the level of potential fire danger at the location where each tanker was then located. [Note: NICC dispatchers do not typically include en route weather in their tanker selection process, and they have not been provided information about the tanker's weather penetration capabilities.] The dispatcher then determined that Tanker 42 was the appropriate asset to send to Alamogordo, and therefore, about 1730 on April 24, contacted Neptune Aviation Services by telephone, and followed up that contact by faxing a copy of Resource Order NM-N5S-000198. Resource Order NM-N5S-000198 directed the crew of Tanker 42 to depart on an "empty" repositioning flight to the Alamogordo Air Tanker Base in Alamogordo, New Mexico. The "Needed Date/Time" in Alamogordo, which was listed in box 12 of the Resource Order, was "04/25/09 at 1300 MST,"

ADDITIONAL DATA AND INFORMATION

FLIGHT CREW COMMUNICATION/COORDINATION

The cockpit voice recorder (CVR) recovered from the wreckage contained about 31 minutes of good quality audio recording. The recording covered the period from 0933:37 to 1004:08 MST. At the very beginning of that recording period, at least one of the flight crew members was listening to the Salt Lake Airport Automatic Terminal Information Service (ATIS) information Echo. After listening to that information and receiving some updated weather from Salt Lake Center, the Captain repeated three of the weather parameters to the First Officer, and at 0934:18, the First Officer replied with, "I'll start down just on the other side of this one." The term "this one" was not further defined. About 70 seconds later, the First Officer advised Salt Lake Center that they were, "leaving 11,500 to remain VFR." Then, at 0939:25, about one minute after Salt Lake Center transmitted an update of pilot reports from crews making approaches into the Salt Lake area, the Captain said, "Let's hang over to the right. That will put us west of that peninsula, but I think we'll be in better shape over there." At the time of this statement, the airplane was about five miles south of Howell, Utah, and on a track that would have taken it along the east side of the Promontory Peninsula (which protrudes southerly from the north end of the Great Salt Lake). In response the First Officer asked the Captain if he should try 7,500 feet, and the Captain replied, "Try seven five for now." The flight crew then discussed some upcoming Class Bravo airspace, and the Captain told the First Officer that they should "hang a left" on the other side of the peninsula and go to the east of that. At 0942:16, when the flight was about 12 miles from where it eventually crossed the north shoreline of the lake, the Captain told the First Officer to, "Go down to six point five," explaining that that would keep them out of the thirty mile Class Bravo veil (the floor of the Class Bravo airspace is 7,600 feet over much of the southern half of the Great Salt Lake). About 45 seconds later, the Captain stated, "That five hundred feet made a big difference," and the First Officer responded with, "Yeah."

At 0943:28, the Captain said, "If we hang a left, just kind of point to the end of that restricted area." Although the crew did not identify the restricted area by number, their flight path soon turned left and headed almost directly in line with Restricted Area 6403, which is located about five miles south of Grantsville, Utah, and active from the surface up to 9,000 feet. The Captain then commented about the "unrestricted visibility" at the level they were at, and then he qualified that statement with, "At least in the ten mile reporting radius." At 0944:11, the Captain stated that it was a "little windy" on the lake today, and then he said to the First Officer, "Let's go down a little more." The First Officer replied with, "Alright," and soon thereafter the Captain stated, "They're showing' ah overcast about sixty, sixty seven." The First

Officer replied to that with, "Yup," and about two minutes later, the crew was given a new frequency for Salt Lake Center. The First Officer reported in on the new frequency, and stated that they were "...level six thousand five hundred."

The Captain then told the First Officer to, "Bear left a little bit," and the First Officer responded with, "Okay." About three seconds later, the Captain said, "Pointing right at some yellow," to which the First Officer did not respond (The screen of the Garmin GPSMAP 396 indicated areas of moderate precipitation in yellow to orange color when operated in conjunction with the subscription XM WX Satellite Weather option). At 0948:21, the Captain stated, "Going back to the mains," to which the First Officer responded, "Okay." The Captain then went through the fuel pump and fuel selector switch procedure for switching back to the main tanks, stating out loud what he was doing as he did it. During the last part of this process, the First officer was talking with Salt Lake Center, which terminated their radar service and told them to contact Salt Lake Approach in about 20 miles. Upon completing the last act of the fuel tank switching sequence, the Captain stated, "And pump is off," and the First Officer responded with, "Okay."

Then about 20 seconds later, the Captain said, "That will take us right through some yellow," to which the First Officer replied, "Okay." About 20 seconds after that response, the Captain said, "If you want, you can go down to six thousand," to which the First Officer replied, "Six thousand, okay." About 25 seconds later, the Captain stated, "I'm gunna call that a good heading," to which the First Officer replied, "Alright." A few seconds later, the Captain stated, "Both of them look like it's a good heading," to which the First Officer did not respond. Then about ten seconds later, the Captain said, "Looks like we'll be in this for about ten miles," to which the First Officer again responded, "Okay."

For about a minute and a-half, starting at 0952:48, the crew interacted about a discussion the Captain had with another pilot while flying over the Great Salt Lake sometime in the past. Then, at 0954:10, the Captain stated, "Okay, there's Antelope Island (the airplane was about 10 miles west of the north end off the Antelope Island at that time.) About five seconds later, the First Officer said, "Okay, there's some terrain comin' up ahead; is that six ah gunna make it. I can see, just barely see it now." The Captain did not respond to the First Officer's comment/question about the terrain, but about 40 seconds later he said, "We are west of the VOR, this is ah Antelope Island. Then, about 20 seconds later, the Captain made the one word statement, "Yeah." At 0957:15, the Captain made a comment about the ADF (Automatic Direction Finder) not working, and then about 15 seconds later told the First Officer to "bend left a little bit." The First Officer responded with, "Alright," and the Captain told him that, "About five degrees is all."

Then, at 0957:47, the Captain stated, "There's the end of Antelope island," to which the First Officer did not respond (the airplane was about 12 miles west of the south end of Antelope Island at that time). About 45 seconds later, the Captain stated, "Inside the veil, but we're not quite underneath the wedding cake. The First Officer did not respond. About 30 seconds later the Captain said, "Stay under this stuff," to which the First Officer responded, "Okay." About 20 seconds later the Captain stated, "There's the interstate (Interstate 80)." The First Officer did not respond. Then about 50 seconds later the Captain said, "We should be getting out ah this stuff shortly," to which the First Officer did not respond.

At 1000:45, as the airplane was passing just west of Grantsville, Utah, the Captain said, "There's the incinerator over there," to which the First Officer did not respond. Then about 15

seconds later the Captain said, "Don't fly over the little square, "to which the First Officer responded, "Got it in sight. Miss the little square." Then for over a minute there was no further crew interaction, until at 1002:10, the Captain stated, "If ya gotta go to fifty five, do it," to which the First Officer responded, "Okay." Then about 20 seconds later, the Captain said, "There goes the little square," to which the First Officer did not respond. Then at 1002:34, when the airplane was about five miles from reaching Utah State Highway 38, and the railroad tracks that parallel it, the Captain said, " Just hang on to the highway and railroad," to which the First Officer responded, "Okay."

At 1004:00, the Captain said, "A little bit to your right," to which the First Officer responded, "Yup." Six seconds after the First Officer's response to the Captains direction, the recording abruptly terminated.

At no time during the CVR recording did the Captain comment about the rising terrain to the east of Utah State Highway 38, nor did he respond to the First Officers' comment/question about upcoming terrain (which took place about 10 minutes prior to impact). After not receiving a response to his comment/question about the upcoming terrain, the First Officer did not attempt to interact further with the Captain about the subject.

The CVR also did not reveal any exclamation, verbal warning, expletive, or oral noise consistent with either of the flight crew members seeing the terrain just prior to impact.

In addition, the graphic display of the raw data provided by the onboard Appareo Systems Operational Loads Monitoring System recorder indicated that there was no rapid pitch or roll movement prior to the time that the airspeed began its very rapid deceleration at 1004:02. In the eight seconds prior to that time, the pitch angle rose at a relatively constant rate from zero (level flight) to approximately four degrees nose up (about one degree every two seconds). The roll rate just prior to impact had progressed at a relatively constant rate from zero (wings level) to about 11 degrees left bank from 1003:57.5 to 1004:02; a period of just over four seconds (about three degrees per second).

History of Flight

Enroute-cruise

VFR encounter with IMC

Controlled flight into terr/obj (CFIT) (Defining event)

Pilot Information

Certificate:	Airline Transport	Age:	66, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	02/17/2009
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	02/28/2009
Flight Time:	7334 hours (Total, all aircraft), 916 hours (Total, this make and model), 6458 hours (Pilot In Command, all aircraft), 9 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Airline Transport	Age:	59, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	03/09/2009
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	02/21/2009
Flight Time:	15075 hours (Total, all aircraft), 350 hours (Total, this make and model), 12454 hours (Pilot In Command, all aircraft), 9 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	LOCKHEED	Registration:	N442NA
Model/Series:	P2V-7	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Restricted	Serial Number:	150283
Landing Gear Type:	Retractable - Tricycle	Seats:	3
Date/Type of Last Inspection:	11/14/2008, AAIP	Certified Max Gross Wt.:	80000 lbs
Time Since Last Inspection:		Engines:	4 Reciprocating
Airframe Total Time:	3554 Hours	Engine Manufacturer:	Wright
ELT:	C126 installed, not activated	Engine Model/Series:	R-3350-32WA
Registered Owner:	NEPTUNE AVIATION SERVICES INC	Rated Power:	2800 hp
Operator:	NEPTUNE AVIATION SERVICES INC	Air Carrier Operating Certificate:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Day
Observation Facility, Elevation:		Observation Time:	
Distance from Accident Site:		Direction from Accident Site:	
Lowest Cloud Condition:		Temperature/Dew Point:	7° C
Lowest Ceiling:	Overcast / 200 ft agl	Visibility	0 Miles
Wind Speed/Gusts, Direction:	8 knots, Variable	Visibility (RVR):	
Altimeter Setting:		Visibility (RVV):	
Precipitation and Obscuration:	Light - Showers - Rain; Fog		
Departure Point:	Missoula, MT (KMSO)	Type of Flight Plan Filed:	Company VFR
Destination:	Alamogordo, NM (KALM)	Type of Clearance:	
Departure Time:	0803 MDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	1 Fatal	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Fatal	Latitude, Longitude:	40.468611, -112.343611

Administrative Information

Investigator In Charge (IIC):	Orrin K Anderson	Adopted Date:	06/17/2010
Additional Participating Persons:	Brent Robinson; Salt Lake City FSDO; Salt Lake City, UT T.R. Proven; FAA Office of Accident Investigation (AAI-100); Washington, DC Colleen Sadeski; Lockheed Martin; Marietta, GA Gary Morgan; USDA Forest Service; Milwaukee, WI Greg Jones; Neptune Aviation Services; Missoula, MT Nicholas Lynn; Neptune Aviation Services; Missoula, MT Douglas Herlihy; Neptune Aviation Services; Missoula, MT		
Publish Date:	08/04/2011		
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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