

		NTSB ID: WPR12GA243		Aircraft Registration Number: N14447	
		Occurrence Date: 06/03/2012		Most Critical Injury: Fatal	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Modena	State UT	Zip Code 84753	Local Time 1347	Time Zone MDT	
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility: 60			
Aircraft Information Summary					
Aircraft Manufacturer LOCKHEED		Model/Series P2V-7		Type of Aircraft Airplane	
Revenue Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>*** Note: : NTSB investigators either traveled in support of this investigation or conducted a significant amount of investigative work without any travel, and used data obtained from various sources to prepare this public aircraft accident report. ***</p> <p>HISTORY OF THE FLIGHT</p> <p>On June 3, 2012, at 1347 mountain daylight time, a Lockheed P2V-7, N14447, designated as Tanker 11 (T-11) collided with mountainous terrain while conducting firefighting operations, 20 miles north of Modena, Utah. The airplane was operated by Neptune Aviation Services under contract with the US Forest Service as an exclusive public-use fixed-wing airtanker service contract conducted under the operational control of the Bureau of Land Management (BLM). Both pilots were fatally injured. The airplane was destroyed by impact forces and post crash fire. Visual meteorological conditions prevailed, and a company flight plan had been filed. The flight originated in Cedar City, Utah, at 1315.</p> <p>The crew of Tanker 11 consisted of the pilot, copilot, and crew chief. They were based out of Missoula, MT, and had been together as a crew for the previous 3 weeks. Normally, the crews stay together for the entire fire season. Tanker 11 crew had operated out of Reno for the 2 weeks prior to the accident. During fire drop operations the tanker is manned by the pilot and copilot, while the crew chief remains at the fire base as ground personnel. The day before the accident while en route from Reno to Cedar City they performed one retardant drop on the White Rock fire, then landed at Cedar City. The crew departed the Cedar City tanker base and arrived at their hotel in Cedar City around 2230. The following morning, the day of the accident, the crew met at 0815, and rode into the Cedar City tanker base together. Tanker 11 took off at 1214 on its first drop on the White Rock fire, and returned at 1254. The crew shut down the airplane, reloaded the airplane with retardant, and did not take on any fuel.</p> <p>Tanker 11 departed the tanker base at 1307 to conduct its second retardant drop of the day, which was to be in the same location as the first drop. Upon arriving in the Fire Traffic Area (FTA) Tanker 11 followed the lead airplane, a Beech Kingair 90, into the drop zone. The drop zone was located in a shallow valley that was 0.4 miles wide and 350 feet deep. The lead airplane flew a shallow right-hand turn on to final, then dropped to an altitude of 150 feet above the valley floor over the intended drop area. While making the right turn on to final behind the lead plane, Tanker 11's right wing tip collided with terrain that was about 700 feet left of the lead airplane's flight path, which resulted in a rapid right yaw, followed by impact with terrain; a fire ball subsequently erupted. Tanker 11 created a 1,088-foot-long debris field and post impact fire.</p> <p>PERSONNEL INFORMATION</p> <p>The captain, age 48, held an Airline Transport Pilot (ATP) certificate with ratings for airplane multiengine land, and commercial privileges for single-engine land, issued on January, 25, 2010, and a second-class airman medical certificate issued on January 17, 2012, with no limitations.</p>					
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The captain reported on his Forest Service Airplane Qualification and Approval Record, dated February 23, 2012, that he had 6,136 total flight hours. His most recent Federal Aviation Regulation (FAR) Part 61.58 pilot-in-command proficiency check was dated February 20, 2012, and was issued his USDA USID Interagency Airplane Pilot Qualification Card, with an expiration date December 31, 2012.

The first officer, age 40, held an Airline Transport Pilot (ATP) certificate with ratings for airplane multiengine land, commercial privileges for airplane single-engine land issued on October 29, 2010, and a first-class airman medical certificate issued on March 5, 2011, with no limitations. The pilot reported on his Forest Service Airplane Pilot Qualification and Approval Record, dated February 20, 2012, that he had 4,253 total flight hours. His most recent FAR Part 61.55 second-in-command check flight was completed on February 20, 2012, and was issued his USDA USID Interagency Airplane Pilot Qualification Card, with an expiration date of December 31, 2012.

AIRPLANE INFORMATION

The Lockheed P2V-7 Neptune was a decommissioned US Navy 4 engine maritime patrol airplane that had been converted for firefighting operations by Neptune Aviation Services, Inc., and was registered to Neptune Aviation Services on September 13, 1993. The airplane, serial number 8010, was manufactured in 1962. It was powered by two Curtiss Wright R3350-32W 3,400-hp engines, equipped with two 4-bladed Hamilton Standard model 24260-323 constant speed propellers, and two Westinghouse J34-WE-36A 3,400-lbf jet engines. Review of airplane maintenance records showed that the airplane was on an approved inspection program (AIP), and the most recent annual inspection was completed on March 9, 2012, at a total aircraft time of 12,293.6 hours. At the time of the accident the total airframe time was 12,311.9 hours, the No. 1 radial engine had 1,643.9 hours since major overhaul (TSMOH), the No. 2 radial engine had 948 hours TSMOH, the No. 1 propeller had 2,777.3 hours TSMOH, the No. 2 propeller had 2,360.9 hours TSMOH, the No. 1 jet engine had 227.3 hours of time in service, and the No. 2 jet engine had 246.8 hours of time in service.

A review of the most recent airplane weight and balance documentation dated June 26, 2010, showed that the maximum gross weight for the airplane was 80,000 lbs, and that the operational weight with 18,720 lbs of fire retardant was 76,793 lbs. Maximum forward center of gravity (CG) limitation was 19.5% of the mean aerodynamic chord (MAC) and maximum aft CG limitation was 38.0% of MAC. The calculated weight of the airplane at the time of the accident with 2 crew, 18,676 lbs of fire retardant, and 7,500 lbs of fuel was 71,117 lbs, which resulted in a calculated takeoff CG of 32.4% of MAC.

FLIGHT RECORDERS

Appareo GAU2000

The Appareo GAU2000 recorder is a lightweight, self-contained attitude, air-data and GPS recording system. The small recorder has an internal GPS unit that provides latitude and longitude position, and GPS altitude and GPS track. The unit also has air data inputs, that when attached to the aircraft's pitot static system, provides indicated airspeed and pressure altitude of the aircraft. The unit also has a mini attitude reference (AHARS) unit that senses 3-axis accelerations and records sufficient information to derive aircraft pitch, roll, and yaw. The memory module that was recovered at the accident scene was sent to the NTSB Vehicle Recorder Laboratory, Washington, DC.

The memory chip from the accident unit was removed from what was left of the circuit card. The chip was cleaned and placed in the lab's memory chip programmer/reader using the appropriate device socket. An image copy of the accident memory chip was obtained. The recording contained approximately 60 flights, which dated back several years. It should be noted that the recorded data stops about ¼ of a mile from the point of 1st impact as provided by the investigator-in-charge (IIC). The Appareo units buffer a small segment of data prior to writing it to memory. Where the unit is at in its buffer/write cycle determines how much data is lost during a catastrophic shutdown of the unit.

The data for the day of the accident included the flight tracks for both the first retardant drop of the day and the accident flight.

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Both the first retardant drop flight and the subsequent accident flight departed from the Cedar City airport, with the intended retardant drop zone in the same location.

The track data of the first flight depicts the tanker flying northwest from Cedar City 58 miles. Upon arrival into the FTA, the track shows a single 180° holding orbit, followed by a teardrop type course reversal that progresses into a right-hand turn onto the final drop course. During the 90 seconds prior to the release of the retardant load the mean sea level (msl) altitude data depicts a fairly steady 6° glide slope into the target area, starting at 8,500 feet msl, down to 7,750 feet msl at a rate of descent of 562 feet per minute (fpm); during the same period the ground was rising at a rate of about 1,350 fpm. During the last 10 seconds of the run the airplane descended 500 feet, then leveled off at 7,250 feet msl, about 100 feet above ground level (agl), and remained at that altitude for 5 seconds before gaining altitude. The track data shows that the airplane departed from the drop zone by making a climbing right-hand turn towards a southwest course back to Cedar City.

The data for the accident flight is continuous from Cedar City to ¼ mile before the location of terrain impact. The track data depicts the tanker flying northwest from Cedar City 58 miles. Upon arriving in the FTA, the track data shows Tanker 11 executing a right-hand 360° holding orbit, followed by a tighter 270° orbit, then a left turn for a teardrop type of course reversal to start the approach into target zone. The last 74 seconds of data depicts the tanker at a steady altitude of 7,750 feet msl (zero glide slope) while the terrain was rising at a rate of about 712 fpm. The ground track of Tanker 11 as it aligned its final course with the drop zone was similar to the first drop earlier that morning.

Comparing the two flights, certain aspects tend to stand out. The same drop zone was identified for both the first and second retardant drops. Tanker 11 approached the drop zone from the south, in a right-hand turn, and the direction of the final drop course was exactly the same for both flights. Tanker 11's rate of turn on to the final course for both drops was performed at the same rate. The most significant difference between the first drop approach and the accident drop approach was that Tanker 11's first approach into the drop zone was initiated from a higher altitude, about 1,000 feet above the ridge line surrounding the west side of the fire, and had a relatively steady rate of descent on to the final drop course. In comparison, the accident flight approached the final drop course from a lower altitude that approximated the elevation of the ridge lines surrounding the west side of the drop zone in level flight while it turned onto the final drop course. The track and altitude data that depict the first drop shows that Tanker 11 flew over the west ridge line and then rapidly descended to get to the proper drop altitude while on the final drop course. The track and altitude data that depict the accident flight shows that Tanker 11 was turning inside and below the shallow valley formed by the western ridge line, which would have reduced the amount of altitude needed to descend in order to establish the proper drop altitude as the airplane rolled out onto its final drop course.

Cockpit Voice Recorder (CVR)

Tanker 11 was equipped with a CVR that records the last 30 minutes of aircraft operation. The digital audio recording is stored on solid state memory modules. Four channels of audio information are retained: one channel for each flight crew and one channel for the cockpit area microphone (CAM).

Upon examination of the CVR by the NTSB Vehicle Recorder Laboratory, it was evident that the CVR had sustained extensive fire and heat damage. The memory case was removed and the interior crash-protected case was opened. The memory board within the crash-protected case was checked for heat or structural damage, and none was found. The accident memory was successfully downloaded from the memory board using the laboratory's surrogate Universal CVR chassis.

The recording and transcript began at 1308:28, just prior to engine start. The recording continued uninterrupted during the taxi, takeoff, and transit to the fire. The crew made contact with the lead airplane (Lead 8) at 1328:54. At 1335:55, the captain calls to start the jet engines and position flaps to 10 degrees. At 1336:25, the first officer states that the number 2 jet engine didn't start, and at the same time Lead 8 informs the crew that there is a bit of a tailwind and to start on to final early.

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During the same transmission Lead 8 states that 7,100 feet will clear the terrain, and that there will be higher terrain off of the right wing. At 1337:26, the crew gets the number 2 jet engine started. At 1339:09, the captain calls to Lead 8 and states that the spacing (between their aircraft) is good. Lead 8 replies that he'll start the base turn and keep it in all the way to final. At 1340:08, Lead 8 says he has the retardant line in sight. At 1340:13 the captain calls for "jets to idle." Eight seconds later the captain calls for "jets," the first officer calls for "airspeed," the captain calls out "jets" again, which was followed by the sounds of first impact.

The recording ended at 1340:24 when electrical power to the recorder was discontinued.

WRECKAGE AND IMPACT INFORMATION

The Hamblin Valley terrain consisted of two ridges that run downhill to the northeast starting at about 7,500 feet msl, creating a shallow valley with a 26-degree slope. Terrain was populated with pinion pine and juniper trees, with sage brush cover. The area was completely burned over at the time of examination, with the ground foliage cover burned out, and tree canopy completely consumed.

The initial point of impact was identified by severed tree tops and the edge of a strip of retardant that was released by the airplane. Trees and bushes coated with retardant appeared plowed up, split, and uprooted along the retardant line. The farthest piece of heavy debris down range from the initial impact was the right-hand radial engine, which was located about 1,088 feet down the valley on a bearing of 057 degrees magnetic.

Wreckage on the top of the ridge closest to the initial point of impact was the right jet engine, right wing tip, and wing flap section. Two flap jackscrews were located in the vicinity of the initial point of impact. A scattering of light debris, which included some cockpit instruments, canopy bows, propeller, Appareo memory module, and fuselage skin from the nose section, was located about 450 feet down hill from the initial point of impact.

Heavy debris was located starting about 865 feet down hill from the ridge line. This debris section contained the retardant tanks and bay doors, cockpit, left radial engine and propeller, left jet engine, wing box, and tail section. The CVR was located next to the tail wreckage. The right-hand radial engine was located about 225 feet beyond the main wreckage, and a propeller tip was located along the fire access road beyond the right-hand radial engine.

Two witnesses had positioned themselves about 1/3 of a mile from the Hamblin Valley on a fire access road where they had a view of the fire tankers dropping retardant. The witnesses captured a 5-frame photo sequence of Tanker 11 colliding with the ridge line. The first photo shows the airplane in a right bank, the right wingtip was hidden by the trees and foliage on the ridge, and a plume of red fire retardant product was being released by the airplane. The second photo revealed that the tanker had rotated to the right about 90 degrees, the right wing was completely hidden by the trees, and a fireball near the right wingtip and right wing was erupting. The third photo shows that the airplane had rotated 180 degrees from the direction of travel and a large fireball had emanated from the right side of the airplane. The fourth and fifth photos show an expanding fireball and black smoke. In all frames of the photo sequence the lead airplane, a twin-engine Beech Kingair 90, can be seen ahead of the tanker and positioned slightly more to the south than the tanker, and in the vicinity of the fire access road at a lower altitude between the two ridges.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the captain on June 4, 2012, by the Utah Department of Health, Office of the Medical Examiner, Salt Lake City, Utah. The listed cause of death was blunt force trauma.

The FAA Forensic Toxicology Research Team, Civil Aerospace Medical Institute (CAMI) performed forensic toxicology on specimens from the captain with negative results for ethanol and listed drugs.

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Carbon monoxide and cyanide tests were not performed.

An autopsy was performed on the first officer on June 4, 2012, by the Utah Department of Health, Office of the Medical Examiner, Salt Lake City, Utah. The listed cause of death was blunt force trauma.

The FAA Forensic Toxicology Research Team, Civil Aerospace Medical Institute (CAMI) performed forensic toxicology on specimens from the first officer with negative results for cyanide, ethanol, and listed drugs. Carbon Monoxide tests were not performed due to the suitability of the specimens.

Updated on Sep 24 2014 2:31PM

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Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
Cedar City Regional Airport	KCDC	5622 Ft. MSL	N/A		
Runway Surface Type:					
Runway Surface Condition:					
Approach/Arrival Flown: NONE					
VFR Approach/Landing: None					
Aircraft Information					
Aircraft Manufacturer		Model/Series		Serial Number	
LOCKHEED		P2V-7		8010	
Airworthiness Certificate(s): Restricted (Special)					
Landing Gear Type:					
Amateur Built Acft? No	Number of Seats: 3	Certified Max Gross Wt.	767925 LBS	Number of Engines: 4	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Reciprocating	WRIGHT	R3350-32WA	3400 HP		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
AAIP	05/2012	20 Hours	12313 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed?/Type Yes / C91	ELT Operated? No	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner		Street Address			
NEPTUNE AVIATION SERVICES INC		City	State	Zip Code	
		MISSOULA	MT	59808-8675	
Operator of Aircraft		Street Address			
NEPTUNE AVIATION SERVICES INC		City	State	Zip Code	
		MISSOULA	MT	59808-8675	
Operator Does Business As:			Operator Designator Code:		
- Type of U.S. Certificate(s) Held:					
Air Carrier Operating Certificate(s): Agricultural Aircraft (137)					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Public Use					
Type of Flight Operation Conducted: Public Aircraft - Federal					

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First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 48
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Sex: M	Seat Occupied: Left	Occupational Pilot? Yes	Certificate Number: On File
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Certificate(s): Airline Transport; Commercial

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Current Biennial Flight Review? 02/2012

Medical Cert.: Class 2	Medical Cert. Status: Without Waivers/Limitations	Date of Last Medical Exam: 01/2012
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	6145	1850								
Pilot In Command(PIC)										
Instructor										
Instruction Received										
Last 90 Days	17	17								
Last 30 Days	7	7								
Last 24 Hours										

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? Yes	Second Pilot? Yes
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Flight Plan/Itinerary

Type of Flight Plan Filed: Company VFR

Departure Point Cedar City	State UT	Airport Identifier KCDC	Departure Time 1315	Time Zone MDT
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Destination Local Flight	State UT	Airport Identifier KCDC	
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Type of Clearance: None

Type of Airspace:

Weather Information

UAT C/S Source of Wx Information:

Company

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Weather Information					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
KCDC	1350	MDT	5622 Ft. MSL	60 NM	130 Deg. Mag.
Sky/Lowest Cloud Condition: Clear			Ft. AGL	Condition of Light: Day	
Lowest Ceiling: None		Ft. AGL	Visibility: 10	SM	Altimeter: 30.03 "Hg
Temperature: 32 °C	Dew Point: -4 °C	Weather Conditions at Accident Site: Visual Conditions			
Wind Direction: 220		Wind Speed: 9	Wind Gusts: 19		
Visibility (RVR):	Ft.	Visibility (RVV)	SM		
Precip and/or Obscuration: No Obscuration; No Precipitation					

Accident Information		
Aircraft Damage: Substantial	Aircraft Fire: Ground	Aircraft Explosion: None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot	1				1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -	2				2
Other Ground					
- GRAND TOTAL -	2				2

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Administrative Information

Investigator-In-Charge (IIC)

Van McKenny

Additional Persons Participating in This Accident/Incident Investigation:

Robert Hendrickson
Federal Aviation Administration
Washington, DC

Keith Raley
Dept of Interior
Boise, ID

Dan Snyder
Neptune Aviation Services
Missoula, MT

Kirk Rothwell
Bureau of Land Management
Boise, ID

Jim Morrison
US Forest Service
Ogden, UT