NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF AVIATION SAFETY
WASHINGTON, D.C.

October 21, 2009

EMERGENCY RESPONSE SPECIALIST REPORT

A. Accident : LAX08PA259

LOCATION	:	Weaverville, California
DATE	:	August 05, 2008
TIME	:	1941 Pacific Daylight Time (PDT)
AIRCRAFT	:	Sikorsky S-61N, N612AZ
OPERATOR	:	Carson Helicopter Services, Inc.

B. Emergency Response Group: None Formed

C. Summary

On August 5, 2008, about 1941 Pacific daylight time,[1] a Sikorsky S-61N helicopter, N612AZ, impacted trees and terrain during the initial climb after takeoff from Helispot 44, located at an elevation of about 6,000 feet in mountainous terrain near Weaverville, California. The airline transport pilot, the safety crewmember and seven firefighters were killed; the commercial copilot and three firefighters were seriously injured.[2] Impact forces and a postcrash fire destroyed the helicopter. The helicopter was being operated by the United States Forest Service (USFS) as a public flight to transport the firefighters from Helispot 44 to another location. The helicopter was registered to Carson Helicopters, Inc. (CHI) of Grants Pass, Oregon, and leased to Carson Helicopter Services, Inc. (CHSI) of Grants Pass. The USFS had contracted with CHI for the services of the helicopter.[3] Visual meteorological conditions prevailed at the time of the accident, and a company visual flight rules flight plan had been filed.

[1] All times in this report are expressed in terms of a 24-hour clock and Pacific daylight time unless otherwise noted.
[2] The safety crewmember was a USFS Inspector Pilot.
[3] Initially, the NTSB was informed that the contract was between the USFS and CHSI. For further information refer to the Operations Factual Report.

D. Details of the Investigation

1.0 Background Information

The United States Department of Agriculture - Forest Service (USDA-FS) and the Department of the Interior (DOI) developed the National Fire Plan (NFP) in August 2000, following a "landmark" wildland fire season. The plan was developed to foster a long-term commitment founded on interagency and intergovernmental partnerships and cooperation. Specifically, to enhance the wildland firefighting response to severe fires and their impacts to communities while ensuring sufficient firefighting capacity for future forest fire incidents. The NFP addresses five key points: Firefighting, Rehabilitation, Hazardous Fuels Reduction, Community Assistance, and Accountability. The USDA-FS and the DOI work together to successfully implement the key points outlined in the NFP.

According to the NFP, an ongoing priority is to ensure that the Departments of Agriculture and Interior maintain a "world-class firefighting organization." The Departments are tasked to continue to provide all necessary resources nationally to ensure that the fire suppression workforce is at the highest efficiency possible in order to protect life and property in as safe a manner as possible. Various Federal, State, local and private agencies have been contracted to assist in carrying out the NFP objectives.

According the Mr. Vassel, the USDA-FS maintained operation of the helibases and employed the Helitack[4] personnel. Carson Helicopter Services, Incorporated; operator of the accident flight, held a contract with the USDA-FS to provide pilots and helicopters for fire suppression, or water drops, and personnel transport in support of forest firefighting missions. The firefighters on the accident flight and assisting in rescue operations were employed by Grayback Forestry, Incorporated, also under contract with the USDA-FS.

The firefighters being transported from H44 on the accident flight were conducting ground-based firefighting operations to suppress one of the fires in the Iron Complex fire system. The helibases[5] and helispots[6] used for the firefighting efforts at the Iron Complex Fire System (see Figure 1) consisted of: Trinity Helibase, Willow Creek Helibase, and the H44 helispot. Depending on equipment and personnel availability, a helibase may utilize any of the surrounding helispots to support the mission. The H44 helispot was selected based on fire, smoke, and wind conditions on the day of the accident.

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[4] All Helitack personnel at H44 at the time of the accidents were employed by the USDA-FS.

[5] According to the Interagency Helicopter Operations Guide (IHOG), a helibase is a designated permanent facility for helicopter operations that has established landing pads, approach and departure paths, and can accommodate a minimum of one Type 2 (medium) helicopter. A temporary helibase is a base for helicopter operations established to serve a temporary or intermittent incident need. A helibase typically has a communications center, on-site emergency equipment, and provides fuel for based helicopters.

[6] According to the IHOG, a helispot may be an unimproved (abrupt or unnatural-appearing opening) improved (trees cut or trimmed) location in the wilderness suitable for use as a landing pad. No permanent facilities are located at a helispot.

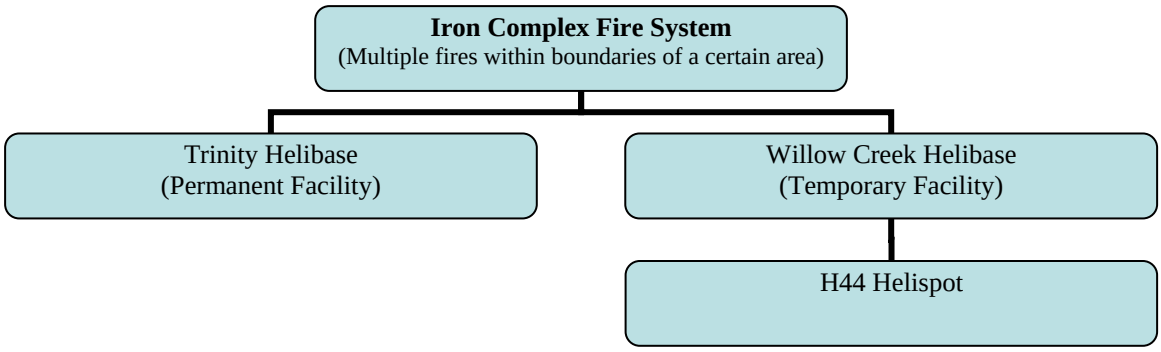

Figure 1: Organization of pertinent locations under the Iron Complex Fire System

2.0 Emergency Notification and Response

The Interagency Helicopter Operations Guide (IHOG), was developed by all of the Agencies participating in helicopter firefighting operations. The IHOG establishes recommended procedures to be followed by the providers and users of the helicopters in an effort to promote safe, cost-effective and effective aviation services. The IHOG recommends that each local unit, or helibase, create an On-Site Accident Preparedness Plan or Aircraft Emergency Response Guide as part of the helibase/helispot operating plan.

The Willow Creek Helibase was a temporary helibase location, established for the Iron Complex Fire System. As such, the Willow Creek Helibase did not have helibase-specific Operations Plan, which includes an Accident Preparedness Plan or Aircraft Emergency Response Guide, in effect. However, since both the personnel who assumed immediate control of the accident site were usually stationed at Trinity Helibase, the Trinity Helibase Operating Guide was reviewed by NTSB staff. The Trinity Helibase Operating Guide, *Section 2: Operational Procedures*, included a Crash/Rescue Plan, and *Appendix 3: Aircraft Emergency Response Guidelines*, outlined steps to be followed in the event of an emergency.

Additionally, an Incident Action Plan (IAP) is developed daily for incident operations which includes helibase and aviation operations. Each day's IAP identifies strategic goals and sets tactical and logistical priorities based on an incident's current firefighting needs and capabilities for response. Included in the IAP is name and location of local hospitals and burn units, contact information for local medivac services, and local emergency telephone numbers. Willow Creek had an IAP in effect at the time of the accident.

2.1 Emergency Notification

2.1.1 Notification of the Accident

According to the Mr. Vassel, he radioed from the H44 helispot to Willow Creek Helibase immediately after the accident occurred, as he ran toward the aircraft to

rescue victims. According to the Radio Station Log for the Iron Complex Command Post, notification of the accident was broadcast over the radio from H44 at 1941.

According to a written statement provided by an Officer with the Trinity County Sherriff's Department who was on duty at the time of the accident, a Trinity County Ambulance and several Forest Service vehicles passed him on a state roadway. After contacting dispatch, he learned the incident commander from the Iron Complex Fire had reported a helicopter crash and had requested medical aid to stand by at the Junction City command post. He asked if the IC from Iron Complex Fire had requested assistance from the Sherriff's Office and was told they were not requested. The Officer responded to the Incident Command Post and saw numerous Forest Service employees at the post monitoring radios. According to the radio traffic, there were four victims being flown out of the site by helicopter and no other victims or injuries were reported. The Officer asked again if the Sherriff's Office was needed and the Forest Service employees replied that they did not need assistance.

According to the Iron 44 Incident Phone Call record, at about 0222, the Deputy IC from the Iron Complex called the Trinity County Sheriff's Department to notify the Sheriff's Office there were nine unaccounted for firefighters from the helicopter accident.

2.1.2 Emergency Notification Procedures

According to the Trinity Helibase Crash Rescue Plan, in the event of an aircraft emergency, the Helibase Manager will notify Iron Communications on the Command Frequency immediately and the helibase will initiate an alert of Crash Rescue Personnel.

The Aircraft Emergency Response Guidelines specifies that personnel provide the dispatcher with a description of the emergency, the number of people involved, and to request appropriate response be initiated.

2.2 Emergency Response

2.2.1 Emergency Response to this Accident

The following timeline of events was developed by NTSB Staff with the assistance of a USDA-FS Helicopter Operations Specialist using Aircraft Flight Following (AFF) data obtained after the event; the Trinity Helibase emergency radio traffic log maintained by various USFS personnel during the event; and Willow Creek Helibase Radio Logs. The timeline begins immediately following notification to Willow Creek Helibase through the completion of the rescue operations:

- At 1943, report of three injured

- At 1946, helicopter N420RL, who assumed role of coordinating/communicating needs of ground personnel to the Communications Unit, was requested to "orbit and report back."[7]

- At 1947, a helicopter N903CH, a exclusive-use helicopter from Shasta-Trinity National Forest from Trinity Helibase, was notified to stand-by for possible water drop.

- At 1950, helicopter N1043T, a water tanker, radioed they were able to make one water drop before returning to the helibase due to low fuel.

- At 1952, additional medics were requested.

- At 1953, helicopter N215KA departs Willow Creek Helibase to accident site with 2 EMTs and medical equipment.

- At 1954, helicopter N1043T arrived at H44 and dropped water onto site.

- At 1955, helicopter N420RL reported 4 injured people on the ground with burn and back injuries.

- At 1957, helicopter N7HE, a medical equipped helicopter, launches to accident site with additional medics.

- At 1957, notified of 13 people onboard.

- At 1959, helicopter N7011M, a water tanker, arrived on scene with water.

- At 2000, fire spread was reported "not to be an issue."

- At 2002, all victims should be taken to Weaverville Helibase where ambulances were standing by for transport to hospital.

- At 2004, the helicopter N903CH from Trinity Helibase was dispatched to respond to the site with water.

- At 2007, helicopter N215KA lands at H44 to deliver EMTs and medical equipment then repositions the helicopter on the ridge east-northeast of H44.

- At 2009, helicopter N7HE lands at H44 to deliver EMTs and medical equipment.

- At 2012, helicopter Reach 5, a medical equipped helicopter, was inbound to scene with additional medics.

[7] "Orbit and report back" is a request for the pilot to overfly the site and report observations.

- At 2018, aircraft N9175N, a fixed-wing Air Attack aircraft, arrived on-scene at H-44 and assumed coordinating/communicating responsibility from N420RL.

- At 2025, helicopter Reach 5 holding awaiting clearance to land, and lands at H44 at 2027.

- At 2029, helicopter N972JG landed at H43, another helispot northwest of H44, with a paramedic to assist.

- At 2031, helicopter Jolly 91, a California National Guard aircraft with night vision, was notified to stand-by.

- At 2034, helicopter N972JG moves from H43 and moves to another spot northwest of H44.

- At 2035, helicopter Reach 5 departed H44 with one patient.

- At 2039, helicopter N215KA contacted AirAttack to reposition at H44 to accept patient.

- At 2040, California Highway Patrol medivac radioed at Junction City Helibase he was inbound to H44.

- At 2042, "pumpkin time"[8] was announced, meaning all non-medivac flights were requested to return to their helibase(s).

- At 2040, requested release of Jolly 91.

- At 2043, Jolly 91 radioed "climbing".

- At 2045, California Highway Patrol medivac arrived over H44, but did not land.

- At 2048, radio discussion that helicopter N215KA, carrying 2 stable patients, should meet Jolly 91, which is night flight capable, at Weaverville Airport to exchange patients.

- At 2054, decision to transfer patients from N215KA to Jolly 91 at Weaverville Helibase confirmed.

- At 2056, helicopter N7HE departs H44 with 1 patient in moderate condition.

- At 2057, helicopter N215KA departs H44 with 2 patients en route to Weaverville Airport.

[8] "Pumpkin time" refers to the end of daylight hours when all operations must cease, as required by the IHOG. The end of daylight is defined in the IHOG as 30 minutes after official sunset.

- At 2057, discussion of number of patients transported four total.

- At 2058, helicopter carrying 2 stable patients verified en route to Weaverville Helibase.

- At 2102, 19 people[9] still at H44.

- At 2146, helicopter N215KA confirmed on the ground and patients had been taken via Jolly 911 medivac.

2.2.2 Emergency Response Procedures

Trinity Helibase Crash Rescue Plan specified there are three priorities, as follows:

> "Priority One: Life and Safety of personnel involved with potential aviation mishap. Only those deemed necessary to respond will be activated. Crash Rescue IC will assume command of the Incident within an Incident
>
> Priority Two: Extrication, in the event of fire at aircraft Crash Rescue IC will make determination of response needed and action taken. Extinguishment of fire will be made to gain access to pilots and/or passengers
>
> Priority Three: Rapid Triage and Stabilization of injured occupants. Based on report from Crash Rescue IC, determination will be made of level of care needed. All updates will be provided to Iron Communications[10]"

The Trinity Helibase Crash Rescue Plan specified that once the event is stabilized, the crash scene and property involved should be preserved for investigation purposes.

The Aircraft Emergency Response Guidelines instructs Helitack personnel to gain access to shutdown the aircraft and/or extricate the injured only as needed. Extricate the passengers only if immediate threat to life is present, "SUSPECT SPINE INJURIES AND TREAT THE INJURED ACCORDINGLY." Otherwise, wait for additional assistance and appropriate equipment. The Guidelines advise "consider air ambulance and helicopter lifeflight depending on nature of injuries". Triage the victims to your level of training and organize incoming emergency resources.

[9] The 19 people includes those at H44at the time of the accident (Helitack and firefighters), plus additional medics and helispot personnel that arrived to H44 during the response. According to USDA-FS records, there were a total of 26 people stayed at H44 overnight.

[10] Iron Communications is located at the Incident Command Post for the Iron Complex fire system, which is located in Junction City.

3.0 Radio Communications

The Aircraft Emergency Response Guidelines reminded the responder to take a handheld radio to the site and to maintain communication with the Redding Communication Center. The Guidelines direct "DO NOT GIVE NAMES OVER THE RADIO."

All communications during the emergency response to the accident were transmitted via radio. Neither Mr. Lingenfelter or Mr. Vassel reported difficulties in maintaining radio communications throughout event.

4.0 Interview with Matt Vassel

Matt Vassel was interviewed by Courtney Liedler via telephone on May 4, 2009.

Mr. Vassel stared he was a Senior Firefighter based at Trinity Helibase and was Incident Commander during the crash rescue response to the accident flight.

Mr. Vassel explained that Redding Emergency Communication Center (ECC) received all calls for forest fires and served as a dispatch center for the Trinity Helibase Operations at the Iron Complex. Trinity Helibase was staffed 24 hours a day, 7 days a week and consisted of two helipads. Over the radio, Redding provided the crew at the Trinity Helibase with fire latitude and longitude, as well as radio communications frequency to be used during firefighting activities. Once a firefighting crew was enroute to the fire, the Helitack crew would call back to Redding to notify the dispatch center they were on their way and Redding's involvement in communications ends. Redding ECC had no role in the firefighting operations. This type of dispatch operation was standard for all of the helibases, including Willow Creek. Once a helibase took control of a specific firefighting mission, the helibase communications center handled all of the communications associated with that mission.

Mr. Vassel typically reported for work at the Trinity Helibase. However, on the day of the accident, he was stationed at the Willow Creek Helibase. The Willow Creek Helibase was an old abandoned airport with a runway that served as a staging area for aircraft to stand-by until needed for firefighting duties. It did not have the permanent building structures that were found at the Trinity helibase; rather Willow Creek had a "command trailer box" (command center) which was a trailer with radios and laptops used for aircraft tracking. Helitack crews typically called back to Willow Creek command center every 15 minutes or so to 'check-in' and notify the command center of the status of their operations. In the event the command center did not get an update from a Helitack crew, the command center would call to verify their status.

Each helibase received an Incident Action Plan (IAP) that was developed daily. The IAP outlined the operational capabilities of that particular base for the day; including availability of personnel (firefighting teams, team leaders name and contact information, aircraft resources available, important telephone numbers, etc.). The plan also included

instructions for where firefighters would be transported in the event of injury during firefighting operations. For example, if a firefighter was injured with a chain saw, the plan specified which hospital the firefighter should be transported to; or if a firefighter were to suffer thermal injuries, it specified a hospital which had a specialized burn center.

Mr. Vassel explained there was a crash rescue plan that was specific to each helibase, and which outlined the procedures for responding to an accident and was what personnel stationed at the helibase were trained to follow. Trinity helibase had a crash recue plan.

On the day of the accident, Mr. Vassel was in the communications center at Willow Creek Helibase working the radios. Since he was familiar with the accident helicopter, he was asked to go up to the H44 helispot (a location for picking up and dropping off firefighters) to brief firefighters awaiting transport off the hill about safety information for their aircraft (i.e., seatbelts, emergency equipment, evacuation methods, etc). He arrived at H44 and conducted his briefings.

The helicopter took off, began to climb and then the rotor began striking trees, which sent debris around Mr. Vassel and other firefighters in the area. He immediately ran down the hill toward the helicopter and called Willow Creek Helibase on his handheld radio to report "there's been an aviation mishap at H44." Willow Creek responded with "a what?" and by the time he made his second radio call a few seconds later, fire was visible and he reported "an aviation mishap with fire involved." He realized his radio transmissions were breaking up as he went down the hill towards the helicopter and turned around to head back up the hill to make sure radio reception would not be compromised. Another Helitack member, Mr. Lingenfelter, was on the hill with Mr. Vassel and was having trouble, unrelated to his position on the hill, with his handheld radio breaking up. Mr. Vassel switched handheld radios with Mr. Lingenfelter. Mr. Vassel stated that, Mr. Lingenfelter continued radio communications with Willow Creek command center personnel and Mr. Vassel worked the radios to conduct ground communications at the scene.

Mr. Vassel stated that when the incident occurred, he knew someone needed to take control. He felt it was "his helispot" and assumed incident command[11] with Mr. Lingenfelter[12]. They both acted on their training and the two of them split the duties of incident command. As survivors were rescued and brought to a safe location away from the aircraft to be treated, Vassel communicated over the radio with the firefighters helping with the rescue efforts over the radio to determine what the survivors needed. He communicated those needs with Mr. Lingenfelter to gain additional resources. Mr. Vassel stated that he could still communicate with either the overflying rescue helicopters or Willow Creek, if needed, but he mostly left those communication transmissions up to Mr. Lingenfelter and Willow Creek Helibase communications center. Mr. Vassel stated that immediately after he notified the personnel in the communications center at Willow

[11] See Attachment 1 for a description of the incident command system as provided by the USDA-FS.
[12] In an interview with Mr. Lingenfelter, he also stated he was the Incident Commander of the accident. Refer to NTSB Operations Attachment 72: Witness Interviews, page 28.

Creek about the accident they requested that other firefighting helicopters, with medical personnel, from Willow Creek and a medivac helicopter respond to the site. All communications during the event were transmitted via radio. The only additional personnel that came to the scene were medical staff to assist in treating the survivors prior to transport.

Mr. Vassel explained that after the rescue operations ended and medivac had transported the survivors off the hill at about 2100 local, the firefighters on scene went into the woods to look for other survivors. Mr. Vassel explained there were a few "false alarms" initially because people thought that they heard voices that ended up being other firefighters calling out "anybody out here." To prevent this, Mr. Vassel called everyone back together and broke people into two groups with defined search areas. When no additional survivors were found, the group built a fire and camped on the hill overnight. Once everyone was "settled down" a bit, they debriefed as a group and Mr. Vassel instructed everyone to write down their accounts of the events of the evening. He did so as well.

The accident helicopter smoldered through the night and next morning. At some time between 2200-2300 local, an Air Attack helicopter flew overhead to check on the firefighters and the accident site. Mr. Vassel communicated with the helicopter, and to his recollection, had his first discussion regarding unaccounted for firefighters or fatalities. Mr. Vassel explained that he did not feel comfortable discussing names or fatalities during the crash rescue operations because of all the people listening on the radio, which was the only method of communication during the entire event. Mr. Vassel also felt there was a sense of shock among all of the crew and firefighters on the hill.

The next morning, the firefighters and Helitack crew hiked 1.5 to 2 miles down the hill to another helispot location. They were then transported (he estimated about 1000 local) via helicopter to Weaverville Airport where they completed a critical incident debrief.

Courtney H. Liedler
Survival Factors Investigator

5.0 Attachments

1. Overview of Incident Command System as Provided by the United States Forest Service

2. Excerpts from the Trinity Helibase Operating Guide

3. Trinity Helibase Crash Rescue Plan