Rapid Lesson Sharing

Event Type: SEAT Strikes Powerline

Date: July 28, 2016

Location: Northern Idaho

NARRATIVE

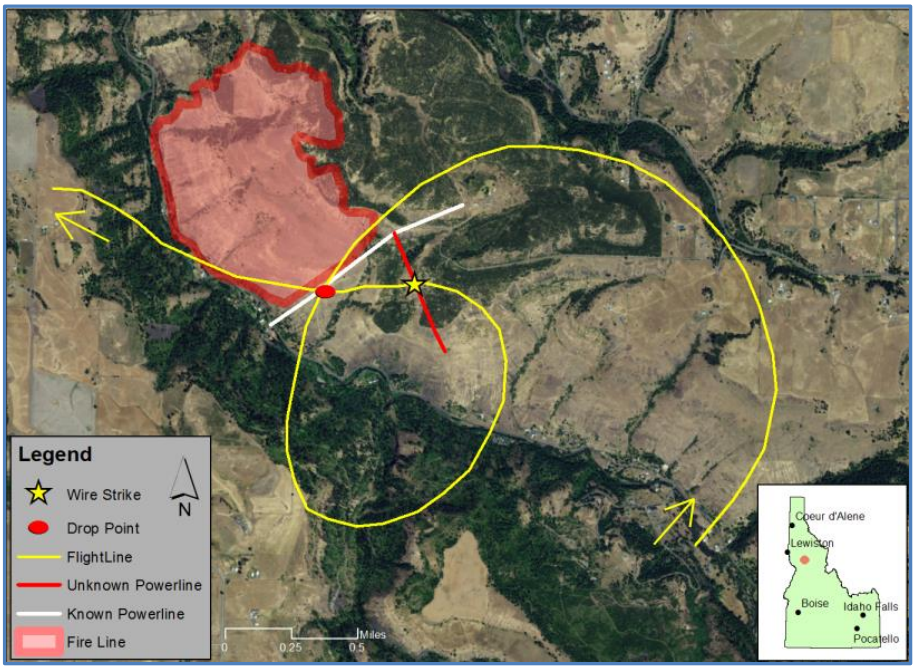
While conducting fire suppression operations, a Single Engine Air Tanker (SEAT) struck a powerline while on final approach for a drop. The pilot was unaware of the strike at the time it occurred. Following the successful drop, the pilot looked out at his left wing and realized that numerous (21) vortex generators (see photo on right) were missing. He informed the Air Attack Group Supervisor (ATGS) and it was recommended that he go to Lewiston, Idaho. However, the Pilot decided that he would return to base at McCall, Idaho.

Replaced vortex generators along the aircraft's left wing. The powerline strike took out 21 of these.

The fire started in the bottom of the canyon and was moving up the steep slope toward a flat ponderosa pine plantation and farmland on top.

New Approach Brings SEAT Over an Undetected Powerline

The SEAT, based out of McCall, was dispatched to the fire near Kooskia, Idaho at 1529 hours. The line strike occurred on the SEAT's second load delivered to the fire. The first load was split and applied on two different runs prior to a Lead Plane arriving on scene.



Flight path and location of powerlines in relation to drop.

On the second load, the SEAT was a little off of the line set by the Lead Plane and the SEAT Pilot was unsure of exactly where the Lead Plane wanted the drop. This prompted the SEAT Pilot to make a dry run.

At this point, the ATGS, who was circling overhead, instructed the Lead Plane to give the SEAT a target and let him work his own approach. The SEAT came back around in a fairly tight circle which created a different final approach than had previously been used. This new approach of the flight line brought the SEAT over a powerline that had not been identified prior to the

The SEAT's flight path was between Power Pole 1 and Power Pole 2, approximately 225 feet from Pole 2.

The distance between poles is 670 feet.

Note how the lines are visible against the sky—but *not* against the darker colors of the terrain, which is how it would have appeared to the SEAT Pilot.

The area in the foreground burned after the strike occurred.

strike. The Pilot identified the location of the known powerline across the draw and concentrated his attention on the approach as he was lining up for the drop.

Pilot Informs ATGS He Might Have Hit Something

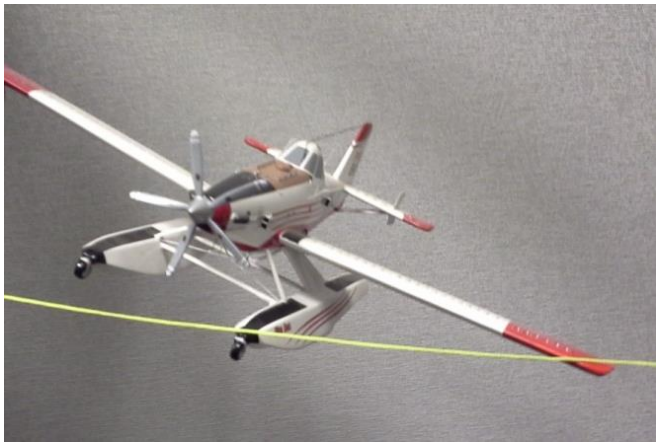
The angle of the bank caused the nose and the right wing of the plane to create a blind spot, obscuring Power Pole 2 from view. The angle of the sun and the dark color of the powerlines would have made them basically invisible against the backdrop of the terrain. The Pilot was unaware of the strike at the time it occurred with the only indication being a brief sound that was not part of the "normal" sounds experienced in the aircraft. The flight was bumpy due to turbulent air that is normal on hot summer days in canyon country. Following the successful drop, the Pilot informed ATGS that he might have hit something.

Pilot Notices Vortex Generators Missing from Left Wing

The Pilot flew back over the drop area and confirmed that the known powerline was still intact. He did not locate the poles from the line that had been struck. As he was heading back to the dip location, he looked out at his left wing and realized that numerous vortex generators were missing. The vortex generators are glued on the wing and have been known to come off in flight, but normally only under extreme cold or hot weather conditions. Normal flight is not affected by missing vortex generators. Their purpose is to add stability, lift, and performance during dipping and dropping maneuvers. All controls of the aircraft were functioning normally.

At this time, it had not been established that a wire strike had, in fact, occurred. The Pilot was initially going to return to the dip site for another load when the ATGS recommended that the SEAT fly to the Lewiston Air Tanker Base to check for possible damage (56 miles with crash/rescue services). The Pilot informed ATGS that he was returning to base at McCall (83 miles without crash/rescue services).

The wire strike was first confirmed when the Pilot was on the ground in McCall and was able to see the black marks from the wire on the wing. At this time, the Tanker Base Manager in McCall alerted Dispatch to notify personnel on the fire that a wire had been struck and of the potential for hot wires on the ground.



A Recreation of What Happened

Approximation of initial contact with powerline is represented in left photo. Photo on right shows the approximate location of the powerlines as the slack was taken up and the lines snapped. This illustration is based on marks on the plane, the angle of the flight path from the plane's GPS, and from information gathered at the scene.

Damage Located at Pontoon Strut Top

The line that was struck was a distribution line consisting of two #6 gauge wires with black rubber coating. The span where the impact occurred was 670 feet between poles. The wire was torn from the cross-arms of both poles before breaking, allowing the slack line from poles 1,900 feet apart to be taken up as the wire moved up the wing and between the pontoons of the plane. The heaviest point of friction and damage to the aircraft was located at the top of the pontoon strut near the fuselage.

Strut damage from the wire strike with repaired step.

Airspeed at the time of impact was estimated at 135 mph as the Pilot began his descent toward the target area. The aircraft had a full load of water on board (approximately 5,800 pounds). Upon safely returning to McCall, the plane was inspected by both company FAA-certified mechanics and the U.S. Department of Interior's Office of Aviation Services (OAS) inspectors. Light repairs were made and the aircraft was returned to service.

Contributing Factors

Wire Not Identified

A powerline located in the area of the previous drops was identified and communicated to all air resources. However, ground and air resources were not aware of the line that was perpendicular to this identified line. Smoke, location of the fire front, and high levels of activity all contributed to the line not being detected. The SEAT Pilot located the known powerline as he was coming around on his approach and mentally "checked the box" and felt he was clear of all hazards.

Site Conditions

The location of the unknown wire in relation to the slope, the tree line, the approach, and the fire are all conditions that led to the line not being visible to the Pilot as he came in on final approach from a different direction. From the cockpit, the power pole on his left would have not been in his line of sight. The power pole to his right would have been obscured by the nose and the wing of the plane as he passed by in a banked position.

Pace of Activity

The pace, while increased, was not abnormal for an emerging Type 3 incident. The fire was initially reported at 1400 hours and the strike occurred at 1725 hours, with the fire approximately 300 acres in size.

A SEAT on approach from the opposite direction above the known powerline.

Multiple Air Resources on Scene

The SEAT Pilot stated that he would have completed a dry run from this new approach angle had he been the only air resource on scene and not affected the flow of the multiple aircraft. Even with numerous aircraft on scene for a small fire (3 Helicopters, 3 SEATS, and 2 heavy Air Tankers, in addition to the Lead Plane and ATGS aircraft), multiple on scene ground and air resources, including an Operations Section Chief Type 1 (OSC1), reported that the air resources were well managed and proper separation between aircraft was established and maintained.

WUI Environment

The fire started along a road near homes in a valley bottom and was moving toward additional homes at the top of the slope. This always brings the potential for unseen hazards as well as an implied urgency to protect homes and communities.

Visibility

Visibility was not a factor any more than is normally experienced in relation to both air and ground activities. Smoke most likely impacted the ability to see out in front of the fire and the direction of flight at the time of the strike would have generally been toward the afternoon sun, further lessening the Pilot's ability to see the powerline prior to the strike.

Communication

Input from ATGS and a Lead Plane Trainee compounded the environment for the SEAT Pilot who normally does not work with Lead Planes.

LESSONS

Low-Level Environment Risks

The vast majority of impacts with ground hazards while flying in the fire environment involve a first pass through an area on a low-level flight. Dip sites, drop sites, and all types of first flights through low-level environments present the highest risk.

Whenever possible, recons at a higher level need to be conducted by air resources before conducting low-level flight missions that may encounter trees, powerlines, towers, or any other obstacles that may by present. ***Until an area has been cleared as free of hazards, always assume that they are present.***

We have a tendency to look for big mistakes or big events that lead to tragic outcomes on fires. Even when the potential is low, the consequences of aircraft accidents are always high.

Need for Ground Forces to Inform Aircraft

Ground forces need to inform aircraft of both known hazards and of the potential for hazards when a ground recon of an area is not possible or has not been conducted due to safety concerns, time, access, or other constraints.

Continuously Monitor and Reassess for Hazards

Continuously monitor and reassess the area for hazards, especially as the fire grows and moves onto new ground.

Importance of Dry Run at Higher Altitude

A dry run at a higher altitude on the first approach from this new angle could have avoided this strike. It is surmised that the wire was initially contacted in the last two feet of the wing as the SEAT was banking into final approach for the drop. The line was then drawn inboard as the Pilot came out of his turn and the tension of the wires increased, all of which happened in fractions of a second.

Higher Awareness is Required in the WUI Environment

A higher awareness of the potential for powerline hazards and communicating them to all resources is important for safe operations within the WUI environment.

Use In-Air Inspection with Other Aircraft

When a strike happens or is suspected of happening, increase the margin of safety by using an in-air inspection with other aircraft whenever possible.

Escort to Landing Site

Aircraft that may have experienced an inflight strike should always be escorted to the nearest landing site whenever other aircraft are on scene.

Consequences of Aircraft Accidents are Always High

Don't let your guard down when you hear/see "*Ops Normal.*"

The "holes in the cheese" that lined up on this incident were small. They were mostly common conditions normally experienced in an initial attack fire that is going to the Type 3 complexity level.

We have a tendency to look for big mistakes or big events that lead to tragic outcomes on fires. Even when the potential is low, the consequences of aircraft accidents are always high.

This incident was a case of numerous normal conditions lining up to produce a potentially tragic outcome.

Link to SAFECOM:
https://www.safecom.gov/searchone.asp?ID=20782

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