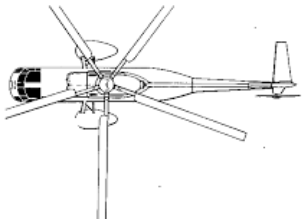
August 4th, 2015

PACIFIC SOUTHWEST REGION

Rapid Lessons Sharing

MAIN ROTOR STRIKE



A rotor strike with a stationary object could result in a catastrophic outcome. The sharing of lessons learned provides for the proactive dissemination of information that can be re-applied in similar circumstances.

An S-61 Helicopter supporting the Cabin Fire on the Sequoia National Forest experienced a main rotor blade strike while positioning to snorkel (siphoning of water) at a dipsite on the Little Kern River.

The helicopter, equipped with a fixed tank and snorkel, had been reassigned to the fire that morning and was on it's first mission. The pilots received a good briefing which included the location of the three pre-identified dipsites being used on the fire (Maggie, No Name, and Little Kern). Maggie Dipsite was the primary dipsite located at 9000 ft. MSL in a cirque basin (see definition). Another Type 1 Helitanker pilot informed the S-61 flight crew there was a "head wind going in and a tail wind going out" of Maggie Dip.

At 1045 the helibase received a request to send all "heavies" (Type 1 Helicopters) to the fire for water support. The Pilot-in-Command (PIC) and Second-in-Command (SIC) of the S-61 discussed the helicopter's performance capability at 9000 ft., and the effect of wind in the cirque basin. They discussed locating a dipsite at a lower elevation in order to be more effective as they could haul almost three times the amount of water to the fire from a lower dipsite.

Example of a Cirque Lake

Cirque: A geologic land feature marked by a bowl shape and steep-walled mountains Cirques are formed by glaciation often containing a small round lake. For aviation resources---cirques pose conditions of erratic, unpredictable winds and are not ideal as dipsites.

Being proactive, the S-61 Pilots contacted Air Attack and requested to evaluate the suitability of the two alternate dipsites located at lower elevations (No Name and Little Kern). The Air Attack mentioned that the No Name dip had been utilized by T2 helicopters equipped with longline and bucket, and it was probably not suitable for snorkel equipped helicopters. The AOBD stated that No Name was often smoked in and unusable. With the information received about the status of No Name Dip, the pilots elected to evaluate Little Kern Dip.

Sequence of Events: The S-61 pilots flew to the Lat/Long location provided for the Little Kern Dip, and found a suitable snorkel site at that location. Prior to descending into the dipsite, the PIC conducted a Hover Out-of-Ground Effect (HOGE) check, and determined there was sufficient power. The pilots assessed wind direction and identified large pine trees and boulders below as potential hazards. Typically, the PIC positions the aircraft so that obstacles, such as trees, are located on the left side (PIC side) of the aircraft. However, in this case the PIC had to reposition the aircraft into the wind while hovering over the dipsite, which put the obstacles on the SIC's side of the aircraft.

Good Risk Management Decisions:

- ◊ The PIC conducted a HOGE check prior to entering the dipsite
- ◊ CRM implementation: pilots were coordinating the tasks and communicating hazards
- ◊ Pilots were cognizant of helicopter performance, and were proactive in trying to locate a lower elevation dip to be more effective

The ***PIC responsibilities*** while snorkeling are normally to scan the torque gauge (looking for 80%), listen to the call-outs (gallons of water) from the SIC, maintain clearance from obstacles, position the aircraft and hold the hover for snorkeling.

The ***SIC responsibilities*** are to have one hand on the Emergency Water Dump T-Handle, call out gallons of water (to ensure proper fill amount), and monitor the tachometers. ***In this instance, the monitoring of outside obstacles was added to the SIC tasks.***

As the pilots descended into the dipsite, the SIC communicated instructions to the PIC to "stay left" of the trees. While in the dip, the PIC heard what he suspected was a blade strike, called out the strike, jettisoned the water and immediately initiated a climb out to get clear of the area.

The pilots assessed the condition of the blades and saw no noticeable damage while in flight. On the climb out, the SIC noticed a smaller diameter tree (estimated to be about 8 ft. in height) that had been located at the helicopter's 4 o'clock position, and missing its top. The Air Attack was notified about the potential blade strike and the pilots provided their intentions to land at the first opportunity. During the short flight to the first suitable landing site, the pilots noted no vibrations or abnormalities

"We didn't see it till we hit it...just didn't see it." SIC

The crew performed a precautionary landing in a field located approximately 10 minutes away from the dip site. The Helicopter Manager was notified of the situation via cell phone. After shut down was complete, the pilots inspected the main rotor blade damage. Maintenance inspectors determined the main rotor blades, rotorhead, transmission and high speed shafts required replacement. The NTSB determined the blade strike as an "Incident", and it was further classified by the Forest Service as an "Incident with Potential".

Successes:

Good CRM: PIC suspected a rotor strike, and immediately communicated to SIC

Air attack was notified immediately; Helicopter Manager was notified after the precautionary landing

Pilots landed at first suitable LZ after the strike occurred, and did not try to return to Helibase

LESSONS LEARNED

The pilots were asked "***what lessons might be offered to other pilots from this experience?"*** Through this discussion and reflection the pilots shared their valuable insight. There were two primary take-ways from the pilot perspective:

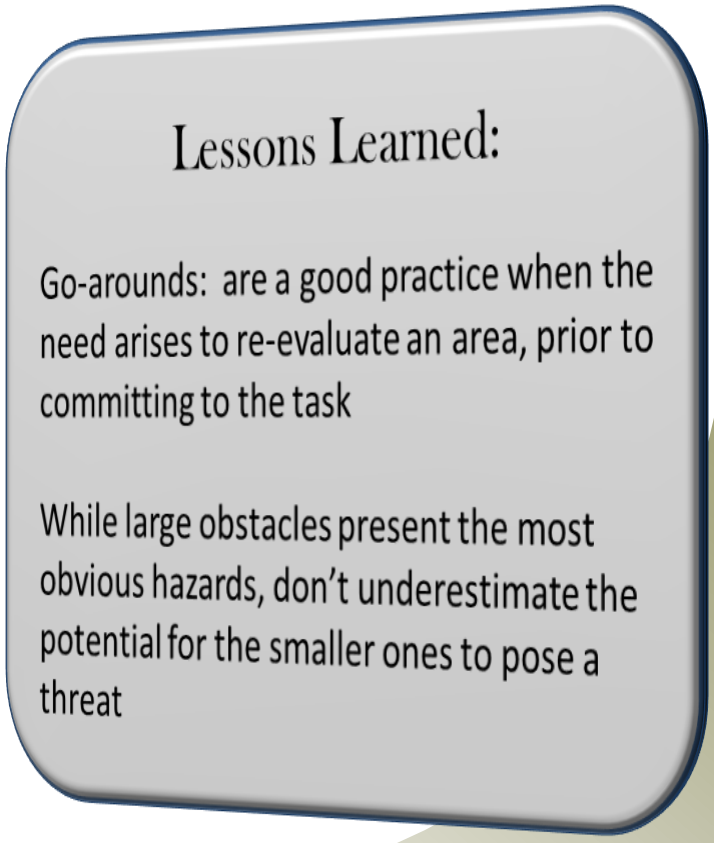
"Maybe I should have gone around and got another angle and could have seen it" PIC

1. Prior to re-positioning an aircraft in a confined area (such as a canyon) , conduct a "fly away" or "go-around". Disengaging from the spot and flying another lap would allow for additional evaluation and discussion about the site and its potential hazards before committing to it.

2. When scanning and identifying hazards there is always potential to become fixated on the larger more clearly visible hazards like big trees and rocks. This fixation can divert attention from the smaller, less conspicuous hazards. The SIC scans outside for hazards in the 10 o'clock to the 3 o'clock sectors, which limits the area that can be viewed from the cockpit. Obtaining a clear view of hazards at the 4 o' clock position can be problematic, especially if those hazards don't appear to be a threat.

" I was looking at big trees and boulders; my fixation was on big stuff, didn't see the smaller tree" SIC

The concept of the "fly away "or "go around" has application not only to aviation operations, but to ground operations as well. From a ground perspective, this is referred to as "taking a step back". The practice provides the opportunity to gain a full view of the area or a "big picture", changes the perspective of the identified hazards, and allows time to reevaluate and discuss changes in the environment. The complex nature of the wildland fire environment requires all operators to use judgment and experience to balance performance, efficiency, risk, and exposure.



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