

Elliott Simpson
Senior Aviation Accident Investigator
AS-WPR

Date: July 20, 2023

Subject: WPR23LA278, N102UM Accident 7/19/23 Farmington, UT

Contact: Mario Nickl, Pilot, Timberland Helicopters

The flight was to drop off a vegetation removal crew, who were contracted by Rocky Mountain Power to remove vegetation surrounding power lines. Three did not speak English, so the fourth translated for them during the preflight briefing. The pilot has not worked with this crew before.

They were all of small stature, and the helicopter fuel load was at about 25-28%. Mr Nickl was not concerned that the helicopter was overloaded; it was well below the maximum gross weight.

He departed from the home base of Ogden, UT that morning, and flew to pick up the crew at a standard LZ at the base of Farmington Canyon, in the foothills of the Wasatch Mountains.

He has about 2,800 hours of total flight time in the accident helicopter, and about 17,000 hours total time. Throughout his career he has encountered countless engine failures but has never "bent metal".

He was a DPE for the SLC FSDO for 10 years and considers himself trusted by the Inspectors from the SLC FSDO.

The number 2 engine compressor had just been changed, and they had encountered problems trying to match the engines. He found it unusual that the engine had a different tone than its replacement, and "howled" like a Lama helicopter. The howling sound was at all power setting; however, it was more difficult to hear in flight, due to the ambient noise. But it was very pronounced on the ground.

He flew a series post-maintenance flights and engine runups in the days leading up to the accident. They had encountered problems matching engine power between the two, and struggled to match N1 and T4, he felt the number 2 engine was a little "lazy". However, through adjustment, they eventually matched the engines.

The morning of the accident was the first time he had flown it for duty since the engine work was performed. He departed to pick up the crew and performed a power check, and all was good. Both engines appeared to perform flawlessly, such that he sent a text message to the mechanic saying all was well.

He picked up the crew and began the climb to the LZ to drop them off, however during the climb he noticed the rotor RPM suddenly drop down to the bottom of the green arc. This was very unusual, because the weather and load were good, and he knew there was no reason for the power to droop because the engine was nowhere near its limits, yet he could not pull any more power. With hindsight, he recognizes that he should have returned to base, but he had another job to perform afterwards and was mission focused.

He began to circle the helicopter to climb to altitude, and then turned towards the LZ, which was about 8,000 ft agl. However, as he approached the LZ the rotor RPM again drooped, and he decided to break off the approach. He initiated a left turn so that he would have maximum power and tail rotor authority, but the helicopter just sank into the trees. The main rotor blades started cutting tree limbs and the engine then over sped. When they came to rest, he shut down the engines, applied the rotor brake, and they egressed. They struck the ground very softly, and the helicopter rolled over. This was a softer landing than any autorotation he has ever performed. They egressed and he put out a fire that had started in an exhaust duct.

He reiterated that the helicopter had way more power than required to land, and that both droops were highly unusual. He was not flying the helicopter at its performance limits.

Elliott Simpson
Senior Aviation Accident Investigator
AS-WPR

Date: July 20, 2023

Subject: WPR23LA278, N102UM Accident 7/19/23 Farmington, UT

Contact: Mitch Runsvold Mechanic

The area weather was heating up, and they changed the compressor section of engine number two in advance of the reduction in performance the weather would bring.

Post change, Chris and Eli did leak checks. Mario said the engine sounded funny, like a Lama helicopter. Mitch didn't think much more of it, and with the post check complete, they were ready for an ops flight.

Mitch flew on that flight with Mario and did hear the whine/squeal sound during startup, but thought maybe it was just a difference in the compressor blade being "crisper" due to the overhaul. He was not concerned.

A few days later Mario said there was a torque split, and the main rotor was slow which is not completely abnormal. It is normal to have to go through an iterative process to match these engines, but this helicopter was generally good.

They looked at it again, and the adjusted the droop compensator, which was an eccentric bushing. Engine number one appeared to react faster, so the maintenance manual stated to adjust eccentric bushing to slow down that engine. That change caused it to adjust both engines. They "beeped" up and checked to make sure both were operating the same, one was at 80% N1 at flat pitch on the ground. Each independently should be at 86 %. Beeping one up sends the other down. They made adjustments and the engines eventually matched.

Mario then took the helicopter out, and said it was still not right, the main rotor speed was just not fast enough. They looked at it again, and adjusted back to the way it was

before, and adjusted speeds again, and readjusted back to 80% and 86%. Pulled pitch, and the needles were together, then after pulling more pitch and they began to split off a bit. They continued with adjustments, and eventually they were able to match them during a hover check.

Mitch still didn't know why they had the engine sound, and with hindsight he should not have accepted it, however the speeds were now perfectly matched.

Mario did mention the compressor the bleed valve for engine number two was coming up on overhaul, and that it maybe time to change, but they decided the other engine was running fine so they could wait.