

9/24/22 N811TA

- Seven minutes from KHUM returning from MC736. Two pilots four passengers.
- Initial descent from 4,500ft into KHUM was established using normal procedures by selecting ALT-A, beginning our descent to 500ft.
- Crew and passengers noticed slight burning plastic smell throughout the aircraft.
  - Passengers alerted crew with their concerns
  - Crew verified no smoke in AFT cabin, no smoke in cockpit, no unusual indications and normal flight characteristics.
  - Announcement was made to passengers informing them the crew was aware of the situation and the air conditioner was turned off and that we would be on the ground soon.
- Approximately 60-90 seconds after discussing whether or not the burning plastic smell was dissipating, a loud \*WHOOOF\* was heard and smoke was witnessed by the RSP rapidly filling the cockpit from the aft portion of the overhead circuit breaker panel.
  - Within 3-5 seconds, the cockpit was engulfed with thick orange/brown smoke resulting in zero visibility for the crew.
  - Simultaneously, the ROTOR LOW, ROTOR LOW audio warning as heard in the crew headsets, along with a rapid overspeed of both engines, combined with a sudden and immediate upward movement of the collective as well as an aft left movement of the cyclic resulting in NR of approximately 83% and a rate of climb in excess of 800 FPM.
  - RSP did everything possible to maintain control of the aircraft while remarking that the cockpit needed to be ventilated.
  - LSP opened small ventilation window to full open which helped a little, but ultimately did not clear the smoke. LSP had zero visibility throughout the situation.
  - LSP attempted to open cockpit door with no success due to high airspeed holding the door shut.
  - LSP removed left side cockpit crew window by forcefully pushing and pulling until able to bring it inside.
  - RSP attempted to open his cockpit door also with no success due to high airspeed and eventually opened small ventilation window to gain fresh air to breath. Upon doing so in conjunction with the LSP window being fully removed, all smoke was cleared from the cockpit.
- After smoke had cleared, full attention was diverted to maintaining aircraft control
  - Collective pitch was pushed to the full down position.
  - The cyclic was forcefully pushed to the forward and right position
  - It is important to note that the collective and cyclic controls had very strong resistance—the collective wanted to move upward on its own while the cyclic wanted to move aft and left resulting in a large amount of force having to be applied constantly throughout the entire emergency.
  - With collective pitch full down, the aircraft power index—PI was initially indicating approximately 145% on both the number one and number two engines.
  - The NR was initially very slow to recover above 83% and possibly went even lower.

- Eventually, NR returned to 100%, the normal operating value.
- While attempting to regain control, the aircraft climbed roughly 3500-4000 feet rapidly with no ability to begin a descent in a traditional fashion.
- In fear of a catastrophic failure of flight controls, the landing gear control lever was selected to the down position, however the landing gear control panel indicator lights were inoperative leaving the crew with no way to ascertain their actual position.
- Meanwhile, the PI was still indicating roughly 140% on each engine, so the crew discussed retarding one engine to idle via the engine mode switch.
- The decision was ultimately made to select engine one to idle to try and reduce the power being applied to the helicopter in order to be able to descend.
- Upon selecting engine one to idle, the NR rapidly decayed from 97-100% down to the high 70's, resulting in the PF/RSP to call for the engine mode switch to be set back to flight ASAP.
- The only way to descend was by forcefully pushing the cyclic forward. The collective was pushed down with full body weight which did nothing to help the aircraft slow down or descend.
- Airspeed throughout the descent was anywhere from 170 to 186 KIAS
- While descending, the RSP/PF instructed LSP/PM to contact Houma Tower and declare an emergency which required a full response of fire, EMS, and anyone that was able to assist.
  - Once tower was notified, Bristow operations management was notified.
  - Once those calls were made, passengers were informed formally of the problem and that it was being worked out to the best of the crew's ability.
- Eventually, the aircraft was descended from 6000 feet directly over Houma airport down to 1000 feet via a high speed, high power diving maneuver.
  - Upon reaching 1000 feet, a right hand orbit was flown around the airport in order to continue establishing aircraft control, combined with a fly by of the control tower to verify that the landing gear was in fact down.
  - The tower verified that all landing gear appeared to be in the down position.
  - At this point, a discussion of how landing would be accomplished occurred.
  - The first idea discussed was switching the engines to manual control mode and attempting to regulate their power via the beep switches on the collective. This was attempted twice with no success.
  - The first time attempted, engine power fluctuations occurred between 5-10% on each engine, but still no controllability of the ECL's would happen.
  - The second time attempted, no fluctuations were observed and the beep switches still remained inoperative.
  - It can be noted that once descending from 6000 feet down to 1000 feet, the PI was now indicating 100-102% on each engine and airspeed was 150-160 KIAS
- Once discovering no way to control the engines via the manual beep switches, it was decided by the crew to reduce the number two engine to idle to see if that would reduce the power being applied to the aircraft to help slow down and achieve a manageable landing configuration.
  - When brought to idle, the aircraft speed reduced from 150-160 KIAS down to 138-144KIAS with the OEI PI at max continuous on the number one engine still at flight.

- It was then decided there would be no other way to reduce the aircraft speed without performing some sort of autorotative maneuver.
- On the first attempt at landing runway 36 while on downwind, the plan was discussed on when to cut the engines entirely and how the aircraft would be slowed down.
- When aligned on a straight in final at 140 knots, the number one engine, which was the only engine at flight, was requested by the RSP/PF to be reduced to idle.
- Once the number one engine was brought to idle, the NR dropped rapidly within 2-3 seconds from 100% down to approximately 70-80% and the aircraft was showing no signs of slowing down to make a safe landing on the runway while the NR was decaying so rapidly even with a flare and high airspeed.
- A go around was performed by bringing the number one engine back to flight and it was discussed by the crew that the same procedure would be attempted but that the pattern flown would be much larger and the altitude would be kept at 400AGL.
- On the second attempt at landing, the number one engine was reduced at the request of the RSP/PF by the LSP/PM much earlier/prior to the runway, and when NR would decay to the low 70% high 60%, the request was made to bring the number one engine back to flight until the NR reached 85% at which point the procedure was repeated until the aircraft was slowed down and low enough to safely perform an autorotative landing.
- Each time power was reduced, the RSP/PF performed a flare of the helicopter while applying left pedal to create drag. It is important to note that even while flaring with high airspeed, the NR would very rapidly decay.
- Once approximately 50 feet AGL, passengers were told to brace by the LSP, a flare was initiated and both engines were requested to be cut to the full off position.
- Full upward collective pitch was applied and the helicopter touched down safely, skidded forward and off of the runway to the right coming to a stop in soft grass.
- Once at a complete stop, the RSP applied the rotor brake which stopped the rotors. The LSP turned off all fuel and electrical switches.
  - At this point, the attention was turned to the egress of the passengers and ensuring their safety.
  - Once safely away from the helicopter and speaking with EMS and fire, it was noticed that the engines were still in operation.
  - The crew then decided to return to the aircraft and pull the ECL's to the full off position which shut the engines off.
- In summary it should be noted that the nature of this emergency was so compounded by flight control issues, electrical fires, and engine fuel management failures that the use of a quick reference hand book was not an option. The discussion to use the hand book was performed, but the crew ultimately decided the full attention needed to be on flying the aircraft, communicating with air traffic control and company, and lastly working out a plan to land the aircraft in such a way that everyone on board survived.

RSP/PF – Steven Buhagiar

LSP/PM- David Sidorski