Autorotations: Reality Exposed

By Scott T. Tyrrell

In modern helicopters, an engine failure is a rare event. However, improper maintenance, a contaminated or inadequate fuel supply, or other mechanical issue may put you into an emergency situation that requires you to execute an autorotation to land the helicopter safely.

Autorotations: Reality Exposed is safety education session born from a collaborative effort by OEMs, operators, and federal agencies to uncover unique aspects of this maneuver and the errors most often discovered in accident investigations. Over the past six years, more than 1,000 pilots have attended this presentation in many venues, including HAI HELI-EXPO®, the FAA International Rotorcraft Safety Conference, and other professional meetings.

Reinforce Autorotation Training

This initiative to reinforce autorotation training for pilots was born out of a National Transportation Safety Board recommendation that stemmed from two fatal helicopter accidents. In each of these accidents, the autorotation was not successful.

All helicopter pilots, in their ab-initio training, must demonstrate that they can successfully complete an autorotation. However, when we practice autorotations in flight training, we are in a controlled environment. We talk about the maneuver before we split the needles, and we usually accomplish a power recovery before we contact the ground.

In an actual emergency, the unexpected happens very rapidly. The bottom drops out, the nose yaws violently, and you must react immediately and correctly if you want to live to fly another day. Pilots need to review their autorotation skills and ensure they can confidently and rapidly repeat this critical maneuver in an emergency.

Tips for Success

Although this article is not intended to tell you everything about autorotations, let's talk about a couple of the most important things that you should know.

Maneuver vs. Emergency

First, the autorotation is a maneuver; the engine failure is the emergency. Our primary goal in conducting additional autorotation education is to turn the emergency into a routine maneuver in which we pilots can protect ourselves and passengers (foremost) and the aircraft (if possible).

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Immediate, Correct Entry

Second, the entry into autorotation must be immediate and correct. Pilots must know the characteristics of the aircraft they are operating and the control movements necessary to maintain rotor RPM and establish an aurorotative glide. In cruise flight, this means that we should always be prepared to get the collective down and apply aft cyclic — fast.

The Goal: A Good Autorotation

Finally, remember that a good autorotation to a bad spot is better than a bad autorotation to a good spot. Sometimes we have to make a landing that will result in damage to the aircraft in order to protect the passengers. Protecting the people in your care (including the guy or gal in the mirror) is always the top priority.

The goal for your entry into autorotation is to make sure that when you reach 100 feet above ground level, you have the proper attitude, airspeed, and rotor RPM. From there, you should be able to execute a good autorotation, even if the landing area is not ideal.

Reduce the Need for Autorotation

Let's not ignore some steps that reduce the likelihood that you will need to make an autorotation. All pilots should take extra precautions after maintenance is performed on an aircraft or before a postmaintenance test flight. Perform an advanced preflight (to learn more about the advanced preflight recommended after maintenance, see pp. 42–44 of the Winter 2017 ROTOR).

Do not underestimate how your skills in fuel management and performance planning can affect flight safety.

Additional Resources

I hope you get a chance to attend an Autorotations: Reality Exposed presentation in the future. A brief, seven-minute video on the subject is available at rotor.org/autorotation. Additional information on autorotation training can be found in FAA Advisory Circular 61-140A, Autorotation Training.

Safe flying — and if your autorotation skills need polishing, make a plan today to get the additional training you need.

Scott T. Tyrrell is the government co-chair of the U.S. Helicopter Safety Team (USHST) Joint Helicopter Implementation Measure Data Analysis Team, which measures the effectiveness of USHST safety enhancements. He is also a continued operational safety specialist/accident investigation in the Safety Management Group of the FAA Rotorcraft Standards staff.