



## 2007-February : Newsletter

To understand the value of published slope landing limitations it is important to consider the test conditions used to demonstrate this maximum slope value. Testing will typically be conducted with a wind of less than 5 knots and a neutral lateral center of gravity. Testing will be conducted on a firm, dry, grass-covered slope. Neither the pilot nor co-pilot will have abnormally large diameter knees or legs. What a published slope landing limitation really means is that under the best of conditions it is possible for a pilot using good pilotage skills to land on the stated slope angle.

The people who wrote the FAA helicopter certification requirements recognized that a successful slope landing is a pilot controlled outcome and not simply a function of aircraft design. When conducting slope landing operations the pilot must consider wind direction and velocity, lateral center of gravity, and the appearance and condition of the landing area (loose rock, soft mud, snow, wet grass, etc. can limit the helicopter's ability to "stick" on the slope), but the limiting factor to any slope landing is cyclic control margin. If the pilot determines that he is approaching the limit of lateral cyclic control margin prior to being firmly planted on the slope with collective reduced to low power it is his responsibility to abort the landing attempt. It makes no difference why the pilot is running out of control margin, whether it's a wind effect or lateral center or gravity effect, or the helicopter begins sliding down the hill or his leg is becoming pinched between the cyclic stick and the collective stick or whatever; the pilot action is the same, abort the landing attempt. For this reason, slope landing accidents are considered pilot error accidents.

At the time the 212 was FAA certified (more than 35 years ago) there were not requirements in CFR 14, FAR Part 29 to publish slope landing limitations in the Rotorcraft Flight Manual and to this day there is still no FAR Part 29 requirements to publish this information. Many later helicopters including the Bell 412 and 430 do have published slope landing limits. Instead of being hard limits the information would be more accurate if the RFM stated, "slide slope landings have been demonstrated up to 10 degrees" or whatever the appropriate value may be.

One reason the industry began to publish slope landing limits for later helicopters is because these values are typically required information for military flight manuals. Since many commercial pilots began their careers as military pilots it was thought this information would be helpful. Since limitations must be something that a pilot can comply with the value of publishing a slope landing limit is questionable. I have never heard of a pilot flying in the mountains, then hovering and dropping a passenger on to the proposed landing area with some sort of slope measurement device to determine if the slope was within the aircraft's published limits. Reading the attitude indicator's roll angle after landing is history.

During helicopter pilot training and certification it's important for pilots to learn and understand the conditions that may limit any particular slope landing attempt. Adverse conditions can limit the maximum slope to a value

significantly less than an aircraft's published slope landing limits.

## SUMMARY

It is the pilot's responsibility to maintain control of the aircraft. If the pilot is reaching a controllability limit as evidenced by a pedal or other control approaching the limit of its travel, the pilot is at the aircraft's limit.

The same comment may be made regarding a helicopter's slope landing capability. Remember, slope landing limitations, which may be published in the flight manual were demonstrated under ideal conditions.

The factors that influence slope landing capabilities are cyclic control power, crosswind lateral center of gravity, gross weight, and the steepness and surface characteristics of the slope. Because the aircraft's controllability limitations are evident to the pilot by the control positions during the landing, maintaining aircraft control defines the aircraft's limitations.

Reprinted from HELIPROPS HUMAN A.D. with the permission of Bell Helicopter Textron.

Author: James M. McCollough, Technical Resource Specialist Experimental Test Pilot.

### **Taxi into Position and Hold (TIPH): Guidance for Pilots**

## BACKGROUND

Because of a rise in TIPH events the FAA reexamined existing TIPH procedures. A Safety Risk Management (SRM) panel was convened consisting of representatives from the Air Traffic Service and the Flight Standards Service, and certain specialists, including experts in aviation human factors. The SRM panel conducted a study comprising analysis of risk and development of mitigations. The panel considered TIPH as it was described in FAA Order 7110.65, Air Traffic Control, and in FAA Order 7210.3, Facility Operation and Administration.

The results of the panel's study are contained in two new FAA Notices effective Feb. 5, 2007 (N JO 7110.456 and N JO 7210.640), and in this Guidance for Pilots.

## DISCUSSION

Imminent departure. TIPH is a procedure intended to position an airplane onto a runway for an imminent departure. Example:

Tower: N234AR runway 24L, position and hold.

This ATC instruction is not a clearance to takeoff.

The SRM panel's analysis of accidents and incidents involving airplanes holding in position revealed that in a number of cases two minutes or more had elapsed between the "position and hold" instruction and an undesirable event, usually a land-over or a go-around. Pilots should be sensitive to the length of time that they have been holding in position whenever they have not been cleared to takeoff and have not been advised of any expected delay. After two minutes in position it would be particularly appropriate to query the controller about the delay holding in position.

When instructed to "position and hold" a pilot should expect an imminent takeoff except when explicitly advised of a delay. Causes for delays in position include wake turbulence and traffic on an intersecting runway, among others.

If a takeoff clearance is not received within a reasonable amount of time after "position and hold" clearance, a pilot should contact ATC. Examples:

Airplane: Cessna 234AR holding in position runway 24L.

or,

Airplane: Cessna 234AR holding in position runway 24L at Bravo.

Similarly, if uncertain about any ATC instruction or clearance a pilot should contact ATC immediately.

Situational Awareness (SA). SA while holding in position can be improved by closely monitoring all radio transmissions, especially clearances issued to other aircraft, and the acknowledgments made by their pilots. Pilots should be particularly alert to another aircraft on the frequency with a similar-sounding call sign. If it is unclear to whom an ATC transmission is addressed, a pilot should question ATC immediately.

Night or reduced visibility conditions. It is crucial at night or in other reduced-visibility conditions that pilots be especially vigilant when cleared to taxi into position and hold. A pilot should scan the full length of the runway and look for airplanes on final approach before taxiing onto an active runway. At any time that there is reason for concern about a potential conflict a pilot should contact ATC immediately.

Multiple runways and intersecting runways. When operations are being conducted on multiple runways it is extremely important to listen closely for your call sign and for any references to your assigned runway. Be alert to similar-sounding call signs and acknowledge instructions to you by including your own call sign in each acknowledgment. When you are holding in position and are in doubt if a takeoff clearance is intended for you, confirm with ATC before beginning the takeoff roll. When an airplane is holding in position on an intersecting runway, or is cleared to do so, ATC will issue traffic advisories to pilots of both airplanes, (1) your airplane and (2) the airplane holding in position, departing, or arriving on an intersecting runway. Examples:

Tower: Delta One, runway 4, position and hold, traffic landing runway 31.

and,

Tower: United Five, runway 31, cleared to land. Traffic holding in position runway 4.

Conflicts with landing traffic. If landing traffic is a factor ATC will advise an airplane holding in position. Such traffic may have requested a full-stop, a touch-and-go, a stop-and-go, or an unrestricted low approach. Pilots should take care to note the position of such traffic on the final approach course or in the local traffic area. Example:

Tower: Cessna 234AR, runway 24L, position and hold. Traffic a Boeing 737, six miles final.

ATC will also advise landing traffic when an airplane is cleared to hold in position on the same runway. Example:

Tower: Delta 1011, continue, traffic a Cessna210 in position runway 24L.

ATC will normally withhold landing clearances on a runway while another airplane is holding in position on the same runway. Never land on a runway occupied by another aircraft of any kind, even if you have received a landing clearance. Pilots on final approach should not hesitate to ask the controller about traffic on the runway of intended landing, and should be prepared to execute a go-around if the runway appears to be occupied.

#### WORDS TO LIVE BY

Always resolve any ambiguity or confusion concerning an ATC transmission by questioning ATC immediately. Likewise, if you have any doubt about your ability to comply with an ATC instruction, advise ATC.

#### RECOMMENDED ACTION

Directors of safety, directors of operations, fractional ownership program managers, trainers and pilots should be familiar with the improved TIPH procedures and phraseology effective February 5, 2007. They should work

together to the extent necessary to address TIPH, as revised, in the manuals and training programs used by pilots, and to apply the recommended practices in daily operations. Key changes include the following:

1. ATC will normally withhold landing clearances on a runway while another aircraft is holding on the same runway.
2. ATC will issue traffic advisories to aircraft holding in position and to aircraft holding, departing, or arriving on an intersecting runway.

FOR FURTHER INFORMATION CONTACT:

Clay Hewitt

FAA

Office of Air Traffic Safety, AJS-0

800 Independence Ave. SW

Washington, DC 20591

202-267-7135

RELATED READING:

FAA Notice N JO 7110.456, Taxi into Position and Hold (TIPH), 2/5/07

FAA Notice N JO 7210.640, Taxi into Position and Hold (TIPH) Operations, 2/5/07

[http://www.faa.gov/airports\\_airtraffic/air\\_traffic/publications/](http://www.faa.gov/airports_airtraffic/air_traffic/publications/)

Have a question or a comment, send it to: [safety@alea.org](mailto:safety@alea.org).

Remember – Safety First!