

PREVENTING LANDINGS WITHOUT CLEARANCE

Original idea from Sherry L. CHAPPELL

A great many reports to NASA's Aviation Safety Reporting System identify pilots' failure to obtain clearances prior to landing. How to prevent Landings without Clearance ?

This reporter's experience is typical :

I was the pilot flying on an IFR approach into MEM for runway 36R. My Captain was in communication with Memphis approach control. They told him to contact the tower at the outer marker. The weather was IMC and when we arrived at the marker, we were in the process of making final landing configuration of our aircraft. The Captain forgot to call the tower, and we landed the aircraft safely and without a conflict with another aircraft, on runway 36R.

Fortunately, most incidents like the above do not result in traffic conflicts or other hazardous consequences. However, their potential for a breach of safety is high. So that we could better assess the factors contributing to landing-without-clearance events, we analyzed a small number (37) of ASRS reports and identified areas where safety improvements might be possible.



CONTRIBUTING FACTORS

Procedural, workload, and memory factors appeared to be the main contributors to the group of ASRS landing-without-clearance incidents.

- Pilot Not on Tower Frequency.

Pilots landing without clearance were often on a frequency other than the tower frequency. Of the 34 pilot reporters who mentioned the frequency they were using when they landed, 25 said they were on approach frequency, while only eight were on tower frequency. Of the eight reporters who did change to tower frequency, five made initial contact with the tower but did not receive landing clearance. Nine of the 37 reporters stated they had never received a frequency change.

This finding has important safety implications. If an aircraft is not on tower frequency, the tower will not be able to contact it directly should a go-around or other safety-related action be necessary.

Also, pilots who land without changing to tower frequency, as instructed, could be in violation of a Federal Airworthiness Requirement (FAR), which requires aircraft operating into airports with an operating control tower to establish two-way radio communications with the control tower (unless aircraft are not equipped for two-way communications).

- High Workload.

Twenty-one reporters implied that their workload was high during approach. The reporters' sources of workload were varied - some were in a training situation, and some were busy coping with weather conditions, as on this approach:

During approach to CLE we were on vectors to intercept ILS 28 at 3000 feet, which we did. We began to encounter precipitation, freezing rain and snow. We were cleared for the approach and to contact tower at PARMA. As we approached PARMA we were told to keep 170 knots to PARMA. Our bug speed was 121 knots. Approaching PARMA LOM we began to experience light turbulence. Our airspeed dropped by 20 knots and gained 30 knots maximum. The glide slope intercept moved very fast to center of bull's-eye with over 1000 fpm descent to stay on glide slope. There was also 20 degrees of crab and fluctuation to stay on localizer. This was very distracting to us and to other aircraft on approach. We placed a lot of concentration on maneuvering the aircraft on the glide slope and localizer and failed to change over to tower at the marker ... After we touched down we realized we did not switch to tower frequency for landing clearance.

The large number of incidents citing workload factors suggests that when workload is high, pilots should exercise additional caution to verify that landing clearance has been received.

- Forgetting to "Contact the Tower at the Marker".

Another pattern in the 37 reports was the likelihood of pilots' forgetting to contact the tower if they were told to do so in advance. Nine reporters indicated they were told to "contact the tower at the marker", sometimes as far as 20 miles out. Seven of these never switched to tower frequency (in the other two reports it was not stated whether a frequency change occurred). The following example was typical:

My First Officer and I were returning from Harlingen, Texas to Austin, Texas on our tenth and final leg of the day. We logged eight hours that day of flight time in rough weather (thunderstorms, turbulence, and occasional windshear). Austin approach control cleared us for the ILS 31L approach to Austin Mueller Airport while we were approximately 10 miles outside the marker and instructed us to contact tower at the OM... After landing and turning off the runway, I noticed that we were still on approach control frequency and had forgotten to contact tower at the marker.

- Confusion Over Phraseology.

Pilots' confusion over phraseology may be an additional factor in their failure to contact the tower. Some pilots may mistakenly believe that the instruction "contact the tower at the marker" means they are supposed to change frequency immediately, but not call the tower until they reach the marker. This misunderstanding may result in their leaving the approach frequency prematurely and being unavailable for contact if the approach controller needs to issue other instructions.

The Airman's Information Manual explains the proper procedures for complying with frequency changes: "When instructed by ATC to change frequencies, select the new frequency as soon as possible **unless instructed to make the change at a specific time, fix, or altitude**. If you are instructed to make the frequency change at a specific time, fix, or altitude, **monitor the frequency you are on until reaching** the specified time, fix, or altitude unless instructed otherwise by ATC". [ASRS emphasis in bold type.]



SOME ATC CONSIDERATIONS. One suggestion for decreasing the number of landings without clearance came through loud and clear in the ASRS reports we reviewed. Pilots suggested that controllers not give the change to tower frequency until they want it to occur. These reports were typical:

Landed on runway 26R in A TL without clearance. Cleared visual 20 miles out told to contact tower at marker. It seems this is the only phase of flight in which you are passed to another controller and told to contact them at a different time... If approach control wants you to contact tower then it should be at the time of transmission or the flight crew should be told to switch by the approach controller when it is required.

In summary, I feel we were led into a trap by giving us an automatic change-over to tower at marker, which reduced approach controller's workload, but also increases the pilots, especially in those types of conditions [dark and stormy night].

Approach controllers we talked to while preparing this article told us they have several reasons for giving the instruction to "contact tower at the marker". One is to maintain an optimal arrival traffic flow. If the change to tower occurs too early (prior to the marker or final approach fix), tower controllers may slow incoming traffic or issue other instructions that disrupt the approach facility's arrival spacing, especially in busy terminal areas. Also, if the approach controller delays issuing the frequency change to tower until an aircraft actually reaches the marker, frequency congestion may make it impossible to complete the change to tower in a timely way.

For many controllers, then, the phraseology "contact tower at the marker" accurately represents the point at which they need the frequency change to occur.

TECHNIQUES FOR PREVENTION

Our analysis of ASRS incidents led us to the conclusion that the best safeguard against landing without a clearance is to develop procedures to ensure that a frequency change has taken place and landing clearance has been received. As these reports show, it is not advisable during a busy approach for pilots to rely on memory to determine whether they have been cleared to land.

- Create a Visual Reminder - and Check It.

Some pilots have developed an effective technique of performing a positive action that creates a visual reminder that is checked as part of their landing procedure. All three of these elements reduce the likelihood of landing without a clearance.

For example, some pilots leave one of the taxi lights off until landing clearance is received. They put the light on when the clearance is received, giving them a visual reminder, the switch position. They then visually check that the light is on as part of the landing checklist.

Another technique is to combine a visual reminder with an audible confirmation of tower frequency. When the landing checklist calls for "cleared to land", the pilot-not-flying (PNF) visually checks the communications radio to ensure that the correct tower frequency has been set, then verbalizes, "cleared to land [specific tower frequency]".

In order for any reminder to work, that final check has to be performed. Several reporters learned this the hard way :

Since the incident I have adopted the technique of mentioning "cleared to land" on final gear and altitude call out.

I flew the ILS to 26L and all checklists were completed normally. At 500 feet I called "30 flaps, final setting (normal procedure), cleared to land?" The First Officer and Second Officer verified 30 degrees flaps and said nothing more. I thought I had heard a clearance to land so did not question the First Officer again. I landed ... Approach control answered and we realized that the First Officer had not switched to the tower at the OM ... Switching to the tower at the marker is so routine it never dawned on me that the First Officer might not have done it ... In the future I will say "are we cleared to land?" instead of merely saying "cleared to land?" Since the incident the company has added a "cleared to land" check on the 1000 foot call out.

- Change to Tower at a Fixed Point.

Another way for pilots to stack the deck in their favor is to develop a habit of always checking that they are on tower frequency at a fixed point, such as at the outer marker or when completing the landing checklist. A fixed altitude may also be the landing clearance reminder, as this reporter notes: *"In future I will check at 1000 foot AGL that we are on tower frequency"*. If a pilot reaches this pre-determined fixed point and has not yet been instructed to change to the tower frequency, a request to approach control to change frequency is recommended.

Even pilots who routinely use this technique can forget to change frequency if they allow distraction or complacency to interfere.

I always go to tower and call at the final approach fix, but was still doing checklists and then became too pre-occupied with the approach. I missed that part of my approach habit pattern.

CONCLUSION

There are no fool-proof techniques we know of to prevent landings without clearance. But fewer of these events are likely to occur if pilots adopt techniques that will help them remember during busy approaches to "tune in" to the tower and verify that they have received landing clearance.