

# Go-Around, Missed Approach and Balked Landings

Although aircraft manufacturers, operators and pilots regard it as part of normal operations, performing a go-around, missed approach, or balked landing is a manoeuvre which involves changing aircraft configuration, attitude and altitude, whilst complying with tracking, altitude and ATC requirements. Most pilots have experienced a go-around at some point in their career, however when it does happen, it will often come as a surprise to the crew.

A go-around may be conducted due to any number of reasons, including weather below minima, ATC instruction, occupied runway or unstable approach, just to name a few.

The ultimate decision to discontinue the approach and landing rests with the Pilot-in-Command. However, any flight crew member should feel free to call for a go-around if they feel that it is necessary to ensure safety.

All flight crew members need to be familiar with the manufacturer's go-around procedure from the Aircraft Operations Manual and should follow the procedure. In most circumstances however, the Aircraft Operations Manual is written for a go-around from minima, in the landing configuration.

It would be fair to suggest that most crews are well practised in engine-out go-arounds, as they are probably the most practised go-around in simulator training. Therefore, the extra performance in an all engine go-around can often come as an unexpected surprise to crew members.

Simulator training also usually includes conducting a go-around from minima on an ILS approach. Therefore, thinking about how to conduct a go-around from different altitudes and different configurations is vital in preparation for the landing, while also taking terrain, weather, ATC requirements and the traffic environment into consideration.

Conducting a go-around from an altitude other than minima adds extra complexity to the manoeuvre in many facets. Forward planning and a thorough crew briefing is critical in part of risk mitigation in regards to conducting a safely executed go-around. Your briefing should include aspects regarding the prescribed Missed Approach procedure and any threats pertaining to the specific approach you are conducting.

This briefing leaflet has not been designed to cover all aspects of a go-around, but instead to promote critical thinking on different scenarios when conducting descent and approach planning, and all references are based upon ICAO PANS-OPS requirements.

## **CONFIGURATION**

If a go-around is required from a relatively high altitude, the gear may not yet have been extended, so there will be no need to call for “gear up”. The flaps may not yet be in the landing position; in fact they may be in the required go-around setting. Therefore, bearing in mind CRM factors, if you call for the flaps to the normal go-around position, when not required to do so, may result in the support pilot moving them to an unintended position.

## **TRACKING**

It is important to remember the tracking requirements if you conduct the go-around from a point before the minima, missed approach point or above the missed approach altitude.

It is a PANS-OPS requirement that if you conduct a go-around prior to the published Missed Approach Point (MAPt), unless otherwise instructed, you must continue to fly to the MAPt before commencing any turns regardless of whether the initial altitude constraints have been met or not. Be aware of any other limitations that may be annotated on the approach chart reference to the turn point e.g. “No turn before D0.6”.

Some 3D approaches (formally Precision Approaches) may not have a MAPt annotated on the approach chart; however, PANS-OPS states, “the MAPt may be defined by the point of intersection of the glidepath with the applicable DA/H”. In this case, lateral tracking via the approach must continue until reaching this point.

## **ALTITUDE**

Consideration should be given to the appropriate modes of the autoflight systems when conducting a go-around from near the missed approach altitude, especially for a go-around that may be required from above the missed approach altitude. For ATC and traffic flow, it is required that you continue a descent to the specified altitude if you are above that altitude when initiating the go-around, unless otherwise instructed.

When a go-around is initiated from an altitude below but close to the missed approach altitude, the energy state of the aircraft and the risk of overshooting the missed approach altitude should be considered.

Procedural altitudes will ensure terrain clearance if navigational accuracy is in doubt.

## **SPEED**

Crew should be aware of speed requirements. This is particularly important when there are constraints on the Missed Approach procedure, taking configuration limit speeds into account, both configuration maximum speeds and minimum manoeuvre speeds. Procedural speeds are in place to ensure airspace or terrain protection.

It is also important to plan your missed approach procedure and requirements before accepting a visual approach. The requirements vary from state to state; so ensure that you are familiar with the requirements before doing so.

## **MDA VS. DA**

When conducting a 2D Approach (formally known as a Non-Precision Approach), there are considerations that should be included in your plan and briefing, including the position of the Missed Approach Point relative to the navaid or runway threshold.

During a 2D Approach, you are not allowed to go below the MDA under any circumstances, unless you have required visual reference. The MDA is an obstacle clearance height/altitude and has different surveyed protections to a Decision Altitude (DA). An allowance should be made for the aircraft to stop descent and start to climb again so as not to go below MDA.

## **USE OF AUTOMATION**

Consideration should be given to the level of automation in use prior to the go-around, and any relevant/necessary change associated with the procedure. Issues to take into account include weather, traffic, workload and fatigue.

## **OTHER**

Although not common, sometimes it may be necessary to conduct a go-around, or balked landing after the minima and before touchdown, even as late as after the aircraft is on the runway. This brings extra complexity into the manoeuvre.

The missed approach gradient is surveyed from the MAPt, and although additions and protections are added to the protected area, crew should ensure that minimal time is wasted in obtaining, and maintaining, a positive rate of climb to ensure obstacle clearance, particularly in IMC.

However, thought should also be given to ensuring a correct rotation rate to the climb attitude to ensure that a tail strike does not occur during the manoeuvre, particularly if executed close to, or after, touchdown. The pilot must be prepared for the aircraft to possibly touchdown during the manoeuvre if executed from a low level (below 50' AGL).

In all cases, the pilot should not commence nor accept an instruction to conduct a go-around after the deployment of reverse thrust. This is due the fact that the blocker doors and/or translator sleeves may not re-stow, creating an uncontrollable aircraft state.

Crew should give consideration to how they would conduct a go-around that has been initiated due a system failure. Performance considerations due to flap asymmetry, landing gear problems or other configuration issues may change the way in which the go-around is conducted. When to conduct the Non-Normal checklist on any malfunction encountered during an approach is worth giving thought to during descent planning.

Lastly, acceptance of ATC radar vectors when the aircraft is below the minimum vectoring altitude after a go-around should be accepted with caution, as the responsibility for obstacle clearance ultimately lies with the pilot.

## **CONCLUSION**

Although this paper does not cover all aspects of the go-around and missed approach, like execution from a circling approach, executing a go-around due to suspected or actual windshear, or loss of navigation integrity, it is important to make a proper plan covering all aspects of a go-around during descent and approach preparations based on the conditions of the day.

### **In summary:**

- Remember the performance differences that might be available from what has been practised in simulator sessions.
- Think about what configuration you are in, and what configuration you need to conduct the go-around. Your current configuration may not be what you are used to starting the manoeuvre with.
- Tracking and altitude requirements on the missed approach may vary depending on where you commence the manoeuvre.
- Plan for altitude loss during the commencement of the go-around (no descent below MDA, and contact with the runway from low level).
- Plan ahead.