

Incorrect QNH Selection

NOTE

This bulletin is for safety purposes only, in all cases, please follow the guidance of your company.

BACKGROUND

On 6 June 2020 a Boeing 787-10, performing the RNP-Y approach for runway 31L at Abu Dhabi (OMAA), using standard QNH 1013 instead of actual QNH 999, descended below the approach vertical profile. The aircraft descended to 210 feet AGL, 1.3 NM from the runway threshold, approximately 350 feet below the correct altitude, according to the approach profile, when the flight crew acquired the PAPI, indicating 4 red, and initiated a go-around.

The aircraft was cleared to climb to 4,000 ft and leveled off at 3,700 ft (indicating 4,000 ft to the flight crew, due to the incorrect QNH). When ATC queried the altitude, the error was resolved, and the aircraft positioned for an ILS approach without further incident.

On 23 May 2022 an A320 performed two consecutive RNP approaches with VNAV minima to runway 27R at Paris Charles De Gaulle (LFPG) on the wrong QNH setting. During the first descent, the approach controller provided a wrong QNH (1011 instead of 1001), which was not recognized by the crew. The approach was therefore performed below the glide path and eventually triggered a Minimum Safe Altitude Warning (MSAW) at the air traffic controller's workstation, who then queried the crew.

In response, a go-around was initiated at 405 ft MSL (indicating 6 ft RA) without having acquired visual contact with the ground and the flight positioned for another approach. The second approach was also performed below the glideslope. The crew, however, acquired visual contact, corrected their trajectory, and landed without further incident.

TECHNICAL BACKGROUND

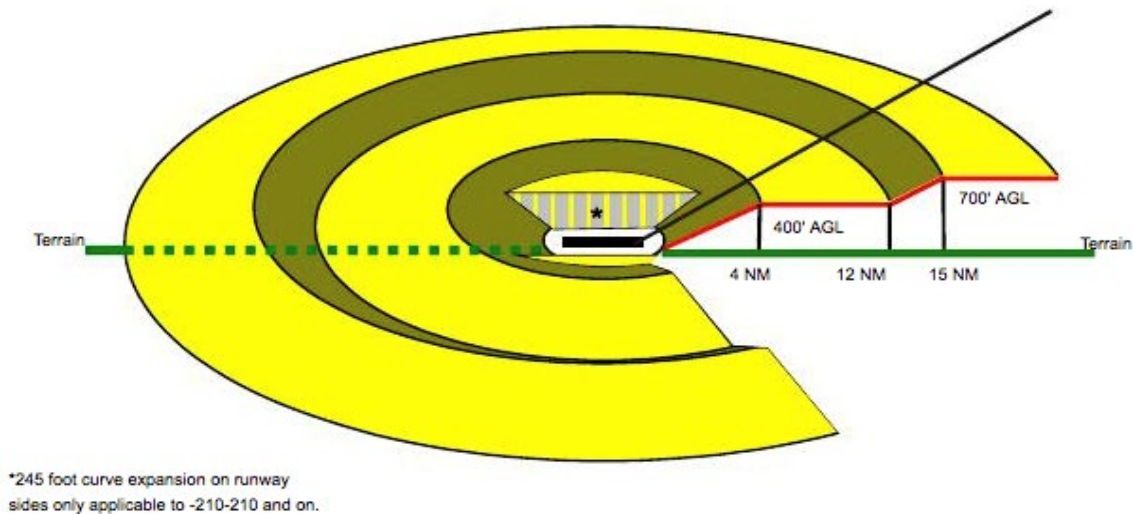
Both aircraft were equipped with eGPWS, which incorporates the Terrain Clearance Floor (TCF) and Runway Field Clearance Floor (RFCF) enhancements:

- TCF creates an increasing terrain clearance envelope around a runway and its alerts are based on current aircraft location, nearest runway position and radio

altitude. TCF complements existing Mode 4 by providing an alert based on insufficient terrain clearance even when in landing configuration.

- Runway Field Clearance Floor (RFCF) is similar to the TCF feature, except that RFCF is based on height above the runway elevation instead of radio altitude.

In both cases no aircraft hardware alert was provided to the flight crews, as the respective flight paths were outside the eGPWS activation envelope, either slightly too close to the runway or too high for the system.



Air traffic control workstations can be equipped with a low altitude alert system. This system functions similar to a GPWS. It is independent and provides alerts to the controllers about aircraft proximity to terrain. The alert can be generated by a steep rate of descent at low altitude or by entering in a safety area around the airport.

Following activation of such an alarm, the controller should inform the crew about the alert. The MSAW alerting phraseology according ICAO DOC 9432 is either: "[CALLSIGN] low altitude warning, check your altitude immediately, QNH is xxxx, the minimum flight altitude is xxxx", or: "[CALLSIGN] terrain alert, climb to xxxx feet QNH xxxx".

RECOMMENDATIONS

- Brief QNH setting procedures, e.g. transition level, waypoint, etc.
- Before commencing any approach, cross-check the local QNH with two independent sources (ATIS, METAR, ATC, etc.).

- At the Final Approach Fix (FAF), verify aircraft altitude versus position.
- Actively listen to ATC communication and maintain situational awareness through monitoring other aircraft clearances.
- Go-around when reaching the minimum for the approach and no visual contact has been attained.
- Be knowledgeable of recovery procedures on ATC low altitude warnings.

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