

SAFETY INFORMATION AND ADVISORY NOTICE (SIAN)		 Transport Malta Civil Aviation Directorate Safety and Compliance Unit Transport Malta Centre Triq Pantar Lija LJA 2021 Malta aviationsafety.tm@transport.gov.mt
SIAN Number: 06/22	Issue Date: 15/07/2022	
Subject: Importance of correct QNH setting with respect to the risk of Controlled Flight Into Terrain (CFIT)		

1.0 INTRODUCTION

Flying an instrument approach with incorrect altitude pressure setting is one of the contributing factors that increases the risk of Controlled Flight Into Terrain (CFIT). Barometric altimeters are provided with a pressure setting control and sub-scale so that the altimeter may be calibrated according to the appropriate pressure setting to indicate flight level, altitude above mean sea level, or altitude above ground level. CFIT is one of the top concerns identified in the European Plan for Aviation Safety (EPAS) and both regulators and operators need to ensure that risks from these safety issues are addressed. This risk is also listed in the State Plan for Aviation Safety (SPAS) in Malta.

An incorrect altimeter reference setting is often the result of one or more of the following factors: High workload, Deviation from normal task sharing, Interruptions and distractions, and Absence of effective cross-check and backup between crewmembers¹.

For an RNP approach with LNAV/VNAV minima, lateral guidance relies on the RNAV/GNSS system and is mainly based on GNSS positioning. Vertical guidance uses the baro-VNAV function, based on the aircraft barometric altitude. All approaches using the baro-VNAV function, can be affected by altimeter setting errors.

On the other hand, vertical guidance satellite-based approaches, such as the RNP (LPV), use vertical guidance based on GNSS positioning and the GNSS augmentation system. They are not sensitive to QNH errors.

Abbreviations	
ATC	Air Traffic Control
ATIS	Automatic terminal information service
CFIT	Controlled Flight Into Terrain
EPAS	European Plan for Aviation Safety
FDM	Flight Data Monitoring
GNSS	Global Navigation Satellite System
LNAV	Lateral Navigation
METAR	Meteorological Terminal Air Report
MSAW	Minimum Safe Altitude Warning
QNH	Altimeter sub-scale setting to obtain elevation when on ground
RNAV	aRea NAVigation

¹ https://www.smartcockpit.com/docs/Altimeter_Setting_and_Use_Of_Radioaltimeter.pdf

RNP	Required Navigation Performance
SOPs	Standard Operating Procedures
SPAS	State Plan for Aviation Safety
TAWS	Terrain Avoidance Warning System
VNAV	Vertical Navigation

2.0 APPLICABILITY

This Notice is to be disseminated to all personnel, and people who have interests relating to the safe conduct of a flight.

Aerodromes:	Not primarily affected.
Air Traffic:	All Air Traffic Control Staff.
Airspace:	Not primarily affected.
Airworthiness:	Not primarily affected.
Flight Operations:	All Operators, training, and Pilots.
Licenced/Unlicenced Personnel:	All ATOs and Registered Training Facilities.

3.0 RECOMMENDATIONS AND INSTRUCTIONS

Effective CFIT accident risk mitigation strategies broadly fall into three categories: Human; Procedural, and Technological.

Operators should ensure that CFIT risk is addressed in their risk register, and the appropriate mitigation measures are implemented. Continuous efforts shall be made to identify any new precursors and mitigated appropriately.

Operators should ensure that their SOPs provide effective measures to assist Flight Crew in mitigating CFIT risks. SOPs should also give considerable attention at maximising the crews' Situational Awareness and to make use of all available sources of information.

Consideration shall be given to the risk of having the same incorrect QNH settings on both altimeters.

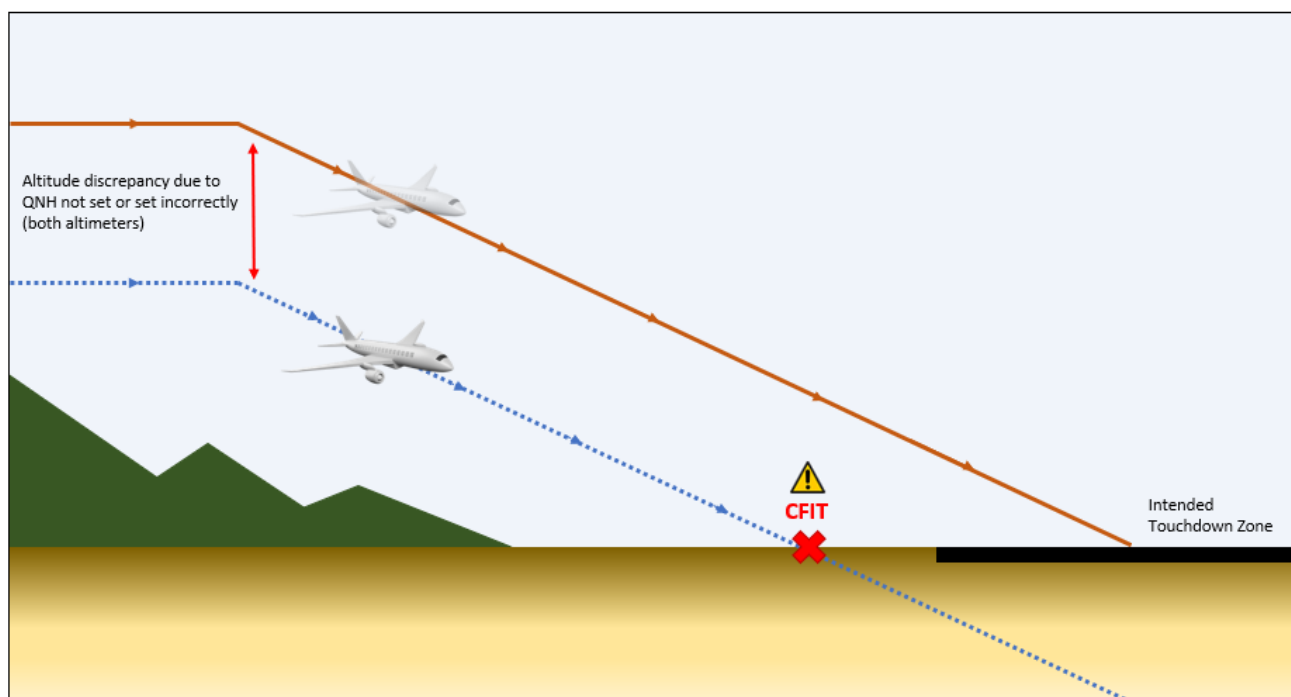
Crew should use effective Threat & Error Management techniques to identify and mitigate against incorrect altimetry when preparing to perform an approach that relies directly on an accurate pressure altimeter sub-scale setting; (ex. baro-VNAV, IAN, MANAGED and 2D approaches).

Flight Crew Training should include the effect of aircraft configuration on TAWS alerts and emphasise that approaches conducted with an incorrect pressure altimeter sub-scale setting may lead to CFIT without a prior TAWS ground proximity warning.

Air Traffic Control service providers should ensure that procedures are in place to mitigate against the risk of incorrect QNH settings used by flight crew.

Air Traffic Control service provider and their relevant staff should be made aware of the importance of correct read-back provided by the flight crew. Any differences from the actual or intended instructions by ATC should be highlighted immediately.

Air Traffic Control service providers and their relevant staff should ensure that the standard phraseology is used when informing the crew about a MSAW, or any other threat, identified by the Controller.



Adapted from Civil Aviation Authority Safety Notice Number SN-2019/001

Defences and Control strategies to mitigate against CFIT risks shall include:

- Adherence to the organisations' SOPs (task sharing, briefings, use of checklists, standard calls and excessive-deviation callouts, mutual crosscheck and backup);
- Cross-check of take-off data;
- Adherence to sterile-cockpit rule;
- Adequate use and supervision of automation;
- Vertical and horizontal flight paths monitoring (situational and energy awareness);
- Altimeter setting cross-check, including having the incorrect setting on both;
- Cross-checking cleared altitude versus minimum safe altitude;
- Cross-checking of the QNH with another source of information such as the ATIS or METAR, or confirmation of the QNH with ATC.
- Timely and adequate response to GPWS/TAWS alert or warning;
- Timely and adequate response to MSAW warning (both by ATC and Flight Crew);
- Timely and adequate response to windshear alert or warning;
- Awareness of minimum vectoring altitudes;
- Awareness of relationship between track distance to runway threshold and height (300 ft/nm rule-of-thumb);
- Awareness of low-OAT correction to be added to minimum approach altitudes/heights;

- Awareness of minimum safe radio-altimeter readings for each approach segment;
- Awareness of "black-hole" or other visual illusions for prevailing approach;
- Timely go-around;
- Adherence to published missed-approach procedure;
- Use of available aircraft technologies for enhanced situation awareness (vertical situation display, head-up display, enhanced-vision, etc.)
- Operators may use data and develop standardised indicators² from FDM programmes (where applicable). Such data and indicators may assist in tracking unsafe situations related to CFIT amongst other events.

Aviate. Navigate. Communicate.

The flight crew must perform these three actions in sequence and must use appropriate task sharing in normal and abnormal operations, in manual flight or in flight with the auto-pilot (AP) engaged.

4.0 FURTHER INFORMATION

The Briefing Room - Controlled Flight Into Terrain | (EUROCONTROL):

<https://skybrary.aero/sites/default/files/bookshelf/21.pdf>

Flight Operations briefing Notes – Supplementary Techniques | (Airbus Customer Services Flight Operations Support and Services):

https://www.smartcockpit.com/docs/Altimeter_Setting_and_Use_Of_Radioaltimeter.pdf

Avoid distraction to prevent CFIT | (EASA and the European Safety Promotion Network – Rotorcraft)

<https://www.easa.europa.eu/avoid-distraction-prevent-cfit>

5.0 CANCELLATION

This SIAN will remain in force until further notice.

Safety and Compliance Unit

² https://www.easa.europa.eu/sites/default/files/dfu/EAFDM_standardised_FDM-based_indicators_v2_Ed2017.pdf