Safety Issue			
Enhanced Ground Proximity Warning System (EGPWS) Database Validity			
Regional Exposure	All Regions	Sector Exposure	All Sectors (IOSA-carrier aircraft are required to be fitted with EGPWS iaw ISM FLT 4.2.7)
Credible Outcome/High Risk Category	Controlled Flight Into Terrain	**Proximity**	**Current/**Emerging/Future

Summary of the Safety Issue

The fitment and use of EGPWS has been demonstrated to be an effective barrier to prevent CFIT type accidents, however its effectiveness is reliant upon on its associated terrain and obstacle database being up to date and valid.

The installation and removal of obstacles, construction or closure of airports and changes to terrain are among the drivers for EGPWS databases to be updated. The frequency of database update implementation by operators is currently variable, driven by the OEM release cycles and not risk based. Vendors/OEMs release their updates at different intervals which impacts operators, especially those with mixed fleets.

Operating without the latest terrain and obstacle database may generate false warnings or result in legitimate warnings not being generated. This has a secondary effect of impacting flight behaviours where warnings are ingored which may erroneously be believed to be false.

The current edition (14) of the ISM contains a recommended practice to periodically review the database validity, but it is not a standard.

A simplified bow tie is found in Appendix I.

Purpose and Scope of SRA:

- To consider the impact of any changes to FLT 4.2.7 from a recommended practice to a standard.
- To propose actions for IATA and recommendations to other stakeholders to undertake.

References used in preparing Assessment

1. IOSA Standards Manual (ISM) Edition 14 – (FLT 4.2.7)
2. ICAO Annex 6
3. Regulation (European Union) 2017/373 (refer DAT.OR.100)
4. FAA Advisory Circular AC 25-23 (p15)
5. GADM Analysis Pack
6. IATA Detailed Implementation Plan for CFIT
7. IATA / Honeywell Guidance Material - Performance assessment of pilot response to Enhanced Ground Proximity Warning System

Existing ISARP Text

FLT 4.2.7

If the Operator uses aircraft equipped with a GPWS with a Forward-looking Terrain Avoidance Function, the Operator should have a process and/or procedures to ensure terrain and, if applicable obstacle data acquired from an external vendor or supplier are:

(i) Periodically reviewed for currency and applicability to the Operator's routes and airports, and updated as required;
(ii) Distributed in a manner to allow the insertion of unaltered data into all aircraft for which it is required. (GM)

Safety Objectives:

- To ensure that EGPWS remains a robust and effective barrier in the prevention of CFIT type accidents.

Considerations

Two workshops held with OEM/manufacturers (Boeing, Airbus, Honeywell, Thales) with feedback from members also sought from the Flight Operations Group.

Summary of Considerations

- The risk profile is variable across operators depending on their scope of operation (AOC Ops Spec) and fleet composition. Therefore, a performance/risk based ISARP should be considered.
- Feedback from operators has been that if the update frequency were to become too regular, such as every 28 days, this would present a potential challenge in implementing database changes this often. Operators with larger fleets, in particular, could find this demanding. The ability for the operator to risk assess and make a determination on an appropriate update frequency should be considered.
- One large European operator cited that it typically takes one month to update the terrain/obstacle databases for one aircraft type in their entire fleet, following the release of an update. A smaller operator indicated that it has a KPI to accomplish the task in a week.
- The updating of databases on modern aircraft types such as B787/A350 which can receive EGPWS database updates via wireless/mobile phone networks is a less invasive and easier maintenance task to accomplish rather than older types. 'Legacy' aircraft types require manual maintenance intervention to undertake the update by updating a memory card in the flight deck. Software updates are effectively a new component 'part-number' and require the associated work order, certification and release to service.
- The update frequency for OEMs can differ, impacting those operators with mixed fleets. Operators believe to some extent there is

a monopoly in the production and release of terrain/obstacle databases.

- Usually the operator does not have the choice to select the database provider. It will be automatically the one assigned by the EGPWS manufacturer. It would be beneficial if the operator had the possibility to choose a single provider for all aircraft types which makes the contract process, the cost and the follow up more efficient.
- For OEMS there are a number of drivers that may delay them becoming aware of changes that necessitate an update to a terrain / obstacle database: i) aerodrome changes lack the specific runway configuration information when publicised, ii) the removal of obstacles is often not publicised and iii) states not promulgating information through AIPs in a timely fashion.
- The inclusion or NOTAMS in database updates further complicates the validity of information, since the incorporated NOTAMS may have validity periods which are not aligned to the frequency at which the database is update and implemented.

Cost Implications:

- OEMs have indicated there would not likely be a cost implication to increasing the frequency of EGPWS database updates.
- There could be an increased cost to airlines / members to increase the frequency at which database updates - arising from a i) potential charge associated with receiving database updates more often from the OEM and ii) any associated maintenance costs for performing the required maintenance more frequently. The type of commercial contract the airline has with the OEM will determine any additional cost.

Risk Transfer / Secondary effects:

- The EGPWS database supports additional functions on existing aircraft and planned new functions on the future aircraft. For example, a Runway Awareness and Advisory System RAAS (Runway Overrun Prevention System ROPS / Runway Overrun Awareness and Alerting System ROAAS) utilises the EGPWS database as an input. One consequence is flight crew receiving “On

Taxiway, On Taxiway" warnings during the take off roll if the database is out of date and the runway is missing. • Although the primary impact is the potential for flight crew to not receive EGPWS alerts/warnings. An undesired secondary effect is that EGPWS alerts/warnings sound negatively, impacting flight crew behaviour such that it becomes a normal behaviour to ignore alerts. Some operators instruct their flight crew to dismiss EGPWS alerts under certain circumstances. • There may be an over-reliance on the use of NOTAMS currently to mitigate changes to terrain/obstacles. This barrier is considered to have limited effectiveness due to the bulk of information passed to crews though this means, meaning critical information may be missed.	
Date Completed	August 2022

Appendix I - Simplified Bow Tie (risk controls not indicated)