



Subject: **HTAWS Specifications**

1. INTRODUCTION

ICAO introduced Ground Proximity Warning System (GPWS) carriage requirements in 1978 to alleviate the Controlled Flight Into Terrain (CFIT) problem. A significant decline in the number of incidents was observed after installation of GPWS. The CFIT, however, continued to be a critical flight safety problem. ICAO has, therefore, amended the GPWS provisions in Annex 6.

2. DEFINITION

ETSO

The ETSO (European Technical Standard Order) authorization represents one way to have parts and appliances approved. This is an optional step which ensures that a part or appliance complies with a minimum performance standard. In all cases, the installer must apply for an installation approval on-board the aircraft. He/she can use the ETSO authorization and he/she complements it to demonstrate that the installation complies with the applicable certification basis for the changed aircraft. European Technical Standard Order authorizations are covered by Subpart O of Part-21 which is the Annex to [Commission Regulation \(EU\) No 748/2012](#).

GPWS

Ground Proximity Warning System. An equipment installed in an aeroplane for the purpose of providing automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth's surface.



HTAWS

Helicopter Terrain Awareness and Warning System. HTAWS is a computer-based system that provides the flight crew with alerts, (both aural and visual) of pending collision of the rotorcraft with the terrain, considering such items as crew recognition and reaction times. Enhanced awareness is achieved by employing a look-ahead function that provides cautions, warnings, and terrain and obstacle display(s).

TSO

A TSO is a minimum performance standard for specified materials, parts, and appliances used on civil aircraft. When authorized to manufacture a material, part, or appliances to a TSO standard, this is referred to as TSO authorization. Receiving a TSO authorization is both design and production approval.

Receiving a TSO Authorization is not an approval to install and use the article in the aircraft. It means that the article meets the specific TSO and the applicant is authorized to manufacture it.

Note: The forward looking terrain avoidance warning equipment is commonly known Enhanced Ground Proximity Warning System (EGPWS) or Ground Collision Avoidance System (GCAS).



3. REQUIREMENTS and CONFORMITY

The HTAWS shall be of an approved type and meet the specifications given in the FAA TSO-C194 and RTCA DO309 documents, or EASA ETSO-C194, or Russian Federal Aviation Order Para. 5.76 (п. 5.76 ФАП-128), or any other specifications acceptable to the applicable Civil Aviation Authority.

Conformity is assured by employing systems that meet or exceed the minimum standards set forth in said specifications above.

- 3.1. The HTAWS shall be installed in an approved manner by an approved organisation/manufacture and shall be maintained in serviceable condition.
- 3.2. Engineers certifying the maintenance of HTAWS shall hold appropriate type rated licences and if applicable, category, and shall be adequately trained on this equipment.



- 3.3. The Air Operator's Operations Manual shall be amended to reflect any change in the operating procedures, where applicable.
- 3.4. Flight Crew shall be adequately trained on this equipment.
- 3.5. Documentation presented to the UN shall be actual, traceable, complete, and in English language demonstrating and verifying the correct certification of HTAWS equipment.



4. OPERATIONAL REQUIREMENTS

HTAWS equipment should provide Ground Proximity Warning System (GPWS), Forward Looking Terrain Avoidance (FLTA), and a display capability, which places an aircraft position symbol on a terrain and obstacle map and applies terrain display algorithms. Terrain and obstacle mapping information may be provided on a Weather Radar display, Electronic Flight Instrument System (EFIS) display, or other compatible display screens. The display of HTAWS information on a Multi-Function Display (MFD) that also serves other purposes should be displayed in a heading up or track up orientation, not in a North up orientation to avoid confusion.

The HTAWS should integrate a terrain and obstacle database with GPS/GLONASS vertical and horizontal position to provide enhanced terrain and obstacle awareness. The enhanced awareness shall incorporate a look-ahead function that provides cautions, warnings, and terrain and obstacle display. The enhanced awareness shall incorporate a look-ahead function that provides cautions, warnings, and terrain and obstacle display.

- 4.1. The HTAWS should provide automatically, as a minimum, warnings under the following circumstances:
 - a) Excessive descent rate;
 - b) Excessive terrain closure rate;
 - c) Excessive altitude loss after take-off or go-around;
 - d) Unsafe terrain clearance while not in landing configuration;
 - e) Excessive downward deviation below the instrument glide path;
 - f) Check of pressure altitude;



- g) Excessive banking angle;
 - h) Excessive pitch angle; and
 - i) Vortex ring danger.
- 4.2. HTAWS should provide flight crews with aural and visual alert aids aimed at preventing a Controlled Flight Into Terrain (CFIT) accident by providing increased terrain and obstacle awareness. The aural alerts should be clear, concise, and unambiguous. Voice callout might include but are not limited to:
- a) Passing of 500-foot height above terrain;
 - b) Passing of dangerous height; and
 - c) Passing of pre-defined fixed altitudes.
- 4.3. Prior to operation of the helicopter fitted with HTAWS, the Operator's Operations Manual should contain appropriate procedures for:
- a) The use of HTAWS equipment;
 - b) Amendment to flight operations procedures and quick reference checklist to include HTAWS;
 - c) Flight crew action with respect to the warnings by HTAWS equipment;
 - d) De-activation for planned non-normal and emergency conditions, and associated requirement to record the HTAWS de-activation in the aeroplane maintenance record that includes the date and time of the de-activation and the deactivation properly placarded in the cockpit; and
 - e) Instructions and training requirements, including proper flight crew reactions in response to the HTAWS audio and visual warnings. Flight Crew members should maintain thought recurrent training sessions the appropriate HTAWS knowledge and skills, in particular when flying an escape maneuver.

Note: In addition to the accuracy and the currency of the HTAWS mapping database, which remains under the responsibility of the Vendor, the UN avails itself the right to check its adequacy depending on the area of coverage required.