WP 114
Version 20 September 2007

GASR
WORKING GROUP

JAR Aerodromes
Subpart E – Aerodrome Data

Arne Paulsen, CAA Norway
Pedrag Sekulic, CAA Slovenia
Gudjon Atlason, CAA Iceland
Gordon Bradley, CAA UK

SECTION 1

SUBPART E – AERODROME DATA

GAR 1.E001 Aerodrome data : general

(a) The aerodrome operator shall determine, document and maintain aerodrome data according to this regulation. The aerodrome operator shall provide aerodrome data , approved when necessary, according to this regulation for publication by the Aeronautical Information Service (AIS) in a way and with the accuracy and integrity as in Table 1 – 5 in Appendix A. The aerodrome operator shall survey data published by the AIS and notify the AIS of any changes necessary to ensure correct and complete data related to the aerodrome.

(b) Determination and reporting of aerodrome data shall be based upon a 95 per cent confidence level. Three types of positional data shall be identified:

(1) Surveyed points (e.g. runway threshold),

(2) Calculated points (mathematical calculations from the known surveyed points of points in space, fixes)

(3) Declared points (e.g. flight information region boundary points).

(c) The aerodrome operator shall ensure that integrity of aerodrome data shall be maintained throughout the data process from survey/origin to the next intended user.

The following classification and data integrity level shall apply:

(1) Critical data, integrity level [1 x 10-8]:

There is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;

(2) Essential data, integrity level [1 x 10-5]:

There is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and

(3) Routine data, integrity level 1 x 10-3

There is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

(d) Protection of electronic aeronautical data while stored or in transit shall be totally monitored by the cyclic redundancy check (CRC).

To achieve protection of the integrity level of critical and essential aeronautical data as classified in (c) above a 32 or 24 bit CRC algorithm shall apply respectively.

(e) To achieve protection of the integrity level of routine aeronautical data as classified in (b) above, a 16-bit CRC algorithm shall apply.

(f) Geographical coordinates indicating latitude and longitude shall be determined and reported to the AIS in terms of the World Geodetic System - 1984 (WGS-84) geodetic reference datum.

Any geographical coordinates which are transformed into WGS-84 coordinates by mathematical means must be indicated.

(g)The order of accuracy of the field work shall be such that the resulting operational navigation data for the phases of flight will be within the maximum deviations, with respect to an appropriate reference frame, as described in tables contained in Appendix A.

(h) In addition to the elevation (referenced to mean sea level) of the specific surveyed ground positions at the aerodrome, geoid undulation (referenced to the WGS-84 ellipsoid) for those positions as described in Appendix A, shall be determined and reported to the AIS.

GAR 1.E005 Aerodrome reference point

(a) An aerodrome reference point shall be established for each aerodrome.

(b) The aerodrome reference point shall be located near the initial or planned geometric centre of the aerodrome and shall normally remain where first established.

(c) The position of the aerodrome reference point shall be measured and reported to the AIS in degrees, minutes and seconds.

GAR 1.E010 Aerodrome and runway elevations

(a) The aerodrome elevation and geoid undulation at the aerodrome elevation position shall be measured to the accuracy of one-half metre or foot and reported to the AIS.
(b) For an aerodrome for non-precision approaches, the elevation and geoid undulation of each threshold, the elevation of the runway end and any significant high and low intermediate points along the runway shall be measured to the accuracy of one-half metre or foot and reported to the AIS.
(c) For precision approach runway, the elevation and geoid undulation of the threshold, the elevation of the runway end and the highest elevation of the touchdown zone shall be measured to the accuracy of one-quarter metre or foot and reported to the AIS.

GAR 1.E015 Aerodrome reference temperature

(a) An aerodrome reference temperature shall be determined for each aerodrome in degrees Celsius.
(b) The aerodrome reference temperature shall be the monthly mean of the daily maximum temperatures for the hottest month of the year (the hottest month being that which has the highest monthly mean temperature). This temperature shall be averaged over a period of 5 years.

GAR 1.E020 Aerodrome dimensions and related information

(a) The following data shall be measured or described, as appropriate, and reported to the AIS for each of the following facilities provided on an aerodrome:

(1) Runway:
- (i) True bearing to one-hundredth of a degree,
- (ii) Designation number,
- (iii) Length,
- (iv) Width,
- (v) Displaced threshold location to the nearest metre or foot,
- (vi) Slope,
- (vii) Surface type,
- (viii) Type of runway
- **(ix)** And, for a precision approach runway category I, the existence or not of an obstacle free zone;

(2) Strip/runway end safety area/stopway:
- (i) Length and width to the nearest metre,
- (ii) Surface type;

(3) Taxiway:
- (i) Designation,
- (ii) Width,
- (iii) Surface type;

(4) Apron:-
- (i) Surface type,
- (ii) Aircraft stands;

(5) The boundaries of the air traffic control service on the movement area;
(6) Clearway:
Length to the nearest metre,
Ground profile;
(7) Visual aids for approach procedures:
- (i) Marking and lighting of:
  - (A) Runways,
  - (B) Taxiways,
  - (C) Aprons,
- (ii) Other visual guidance and control aids on taxiways and aprons, including
  - (A) Taxi- holding positions and stopbars,
  - (B) Location and type of visual docking guidance systems;

(8) Location and radio frequency of any VOR aerodrome check-point;
(9) Location and designation of standard taxi-routes;
(10) Distances, in relation to the associated runway extremities, to the nearest metre or foot of

(i) Localizer and glide path elements comprising an instrument landing system (ILS),

(ii) Azimuth and elevation antenna of microwave landing system (MLS).

(b) The geographical coordinates of each of the following shall be measured and reported to the AIS in degrees, minutes, seconds and hundredths of seconds:

(1) Threshold

(2) Appropriate taxiway centre line points

(3) Each aircraft stand

(c) The geographical coordinates of any obstacles according to Annex 15 shall be measured and reported to the AIS in degrees, minutes, seconds and tenths of seconds

(d) The following information shall also be provided where possible:

(1) Type of obstruction,

(2) The top elevation rounded up to the nearest metre or foot,

(3) Markings on the obstruction,

(4) Any lighting.

GAR 1.E025 Strength of pavements

(a) The bearing strength of a pavement shall be determined.

(b) The bearing strength of a pavement intended for aircraft of apron mass greater than 5 700 kg shall be made available using the aircraft classification number - pavement classification number (ACN-PCN) method by reporting all of the following information:

(1) The pavement classification number (PCN);

(2) Pavement type for ACN-PCN determination;

(3) Sub-grade strength category;

(4) Maximum allowable tyre pressure category or maximum allowable tyre pressure value;

(5) Evaluation method.

(c) The pavement classification number (PCN) reported shall indicate that an aircraft with an aircraft classification number (ACN) equal to or less than the reported PCN can operate on the pavement subject to any limitation on the tyre pressure, or aircraft all-up mass for specified aircraft type(s).

(d) The ACN of an aircraft shall be determined in accordance with the standard procedures associated with the ACN-PCN method.

(e) For the purposes of determining the ACN, the behaviour of a pavement shall be classified as equivalent to a rigid or flexible construction.

(f) Information on pavement type for ACN-PCN determination, subgrade strength category, maximum allowable tyre pressure category and evaluation method shall be reported using the following codes:

(1) *Pavement type for ACN-PCN determination*:

(i) Rigid pavement = Code R

(ii) Flexible pavement = Code F

(2) *Subgrade strength category*:

(i) *High strength: Code A*

Characterized by K = 150 MN/m3 and representing all K values above 120 MN/m3 for rigid pavements, and by CBR = 15 and representing all CBR values above 13 for flexible pavements.

(ii) *Medium strength: Code B*

Characterized by K = 80 MN/m3 and representing a range in K of 60 to 120 MN/m3 for rigid pavements, and by CBR = 10 and representing a range in CBR of 8 to 13 for flexible pavements.

(iii) *Low strength: Code C*

Characterized by K = 40 MN/m3 and representing a range in K of 25 to 60 MN/m3 for rigid pavements, and by CBR = 6 and representing a range in CBR of 4 to 8 for flexible pavements.

(iv) *Ultra low strength: Code D*

Characterized by K = 20 MN/m3 and representing all K values below 25 MN/m3 for rigid pavements, and by

CBR = 3 and representing all CBR values below 4 for flexible pavements.

(3) *Maximum allowable tyre pressure category:*

(i) High:
No pressure limit
Code W

(ii) Medium:
Pressure limited to 1.50 Mpa
Code X

(iii) Low:
Pressure limited to 1.00 Mpa.
Code Y

(iv) Very low:
Pressure limited to 0.50 Mpa
Code Z

(4) *Evaluation methods:*

(i) Technical evaluation: Code T

Representing a specific study of the pavement characteristics and application of pavement behaviour technology.

(ii) Using aircraft experience: Code U

Representing knowledge of the specific type and mass of aircraft satisfactorily being supported under regular use.

(g) The bearing strength of a pavement intended for aircraft of apron mass equal to or less than 5 700 kg shall be made available by reporting the following information:

(1)Maximum allowable aircraft mass; and

(2) Maximum allowable tyre pressure.

GAR 1.E030 Pre-flight altimeter check location

(a) One or more pre-flight altimeter check locations shall be established on an aerodrome.

(b) The elevation of a pre-flight altimeter check location shall be given as the average elevation, rounded to the nearest metre or foot, of the area on which it is located. The elevation of any portion of a pre-flight altimeter check location shall be within 3 m (10 ft) of the average elevation for that location.

GAR 1.E035 Declared distances

The following distances shall be calculated to the nearest metre or foot for each runway:

(a) Take-off run available;

(b) Take-off distance available;

(c) Accelerate-stop distance available;

(d) Landing distance available.

GAR 1.E040 Conditions of the movement area and related facilities

Water on a runway

(a) Whenever water is present on a runway, a description of the runway surface conditions, as described in GAR 1.D35 d), shall be reported to the ATS.

(b) Information that a runway or portion thereof may be slippery when wet shall be reported to the ATS.

(c) Information on the minimum friction level specified by the National Aviation Safety Authority for reporting slippery runway conditions and the type of friction measuring device used shall be made available.

Snow, slush or ice

(d) Aerodromes using the SNOWTAM, shall report the conditions on the movement area to the ATS in a special format from which the ATS can issue a SNOWTAM. The format shall be designed according to Appendix B.

GAR 1.E045 Visual approach slope indicator systems

The following information concerning a visual approach slope indicator system installation shall be made available:

(a) associated runway designation number;

(b) type of system. For an AT-VASIS, PAPI or APAPI installation, the side of the runway on which the lights are installed, i.e. left or right, shall be given;

(c) where the axis of the system is not parallel to the runway centre line, the angle of displacement and the direction of displacement, i.e. left or right, shall be indicated;

(d) nominal approach slope angle(s). For a T-VASIS or an AT-VASIS this shall be the angle θ according to the formula in Figure X-X, and for a PAPI and an APAPI this hall be the angle (B+C) ÷ 2 and (A+B) ÷ 2, respectively as in Figure X-X; and

(e) minimum eye height(s) over the threshold of the on-slope signal(s). For a T-VASIS or an AT-VASIS this shall be the lowest height at which only the wing bar(s) are visible; however, the additional height(s) at which the wing bar(s) plus one, two or three fly down light units come into view may also be reported if such information would be of the benefit to aircraft using the approach. For a PAPI this shall be the setting angle of the third unit from the runway minus 2', i.e. angle B minus 2', and for an APAPI this shall be the setting angle of the unit farther from the runway minus 2', i.e. angle A minus 2'.

GAR 1.E050 Coordination between AIS and the aerodrome operator

(a) To ensure that AIS units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between the AIS and the aerodrome operator to report to the responsible AIS unit, with a minimum of delay:

(1) information on aerodrome conditions related to conditions of the movement area, disabled aircraft removal, rescue and firefighting and visual approach slope indicator systems.

(2) the operational status of associated facilities, services and navigation aids within their area of responsibility;

(3) any other information considered to be of operational significance.

(b) Before introducing changes to the air navigation system, due account shall be taken of the time needed by the AIS for the preparation, production and issue of relevant material for promulgation.

(c) The predetermined, internationally agreed AIRAC effective dates in addition to 14 days postage time shall be observed by the aerodrome operator when submitting the raw information/data to the AIS.

APPENDIX A

AERONAUTICAL DATA QUALITY REQUIREMENTS

Table A-1: Latitude and Longitude

Latitude and longitude	Accuracy Data type	Integrity Classification
Aerodrome reference point	30 m surveyed/calculated	1×10^{-3} routine
Navaids located at the aerodrome	3 m surveyed	1×10^{-5} essential
Obstacles in Area 3	0.5 m surveyed	1×10^{-5} essential
Obstacles in Area 2 (the part within the aerodrome boundary)	5 m surveyed	1×10^{-5} essential
Runway thresholds	1 m surveyed	1×10^{-8} critical
Runway end (flight path alignment point)	1 m surveyed	1×10^{-8} critical
Runway centre line points	1 m surveyed	1×10^{-8} critical
Runway holding position	0.5 m surveyed	1×10^{-8} critical
Taxiway centre line/parking guidance line points	0.5 m surveyed	1×10^{-5} essential
Taxiway intersection marking line	0.5 m surveyed	1×10^{-5} essential
Exit guidance line	0.5 m surveyed	1×10^{-5} essential
Apron boundaries (polygon)	1 m surveyed	1×10^{-3} routine
De-icing/anti-icing facility (polygon)	1 m surveyed	1×10^{-3} routine
Aircraft stand points/INS checkpoints	0.5 m surveyed	1×10^{-3} routine

Note: See Annex 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Table A-2: Elevation/altitude/height

Elevatioln/altitude/height	Accuracy Data type	Integrity Classification
Aerodrome elevation	0.5 m surveyed	1×10^{-5} essential
WGS-84 geoid undulation at aerodrome elevation position	0.5 m surveyed	1×10^{-5} essential
Runway threshold, non-precision approaches	0.5 m surveyed	1×10^{-5} essential
WGS-84 geoid undulation at runway threshold, non-precision approaches	0.5 m surveyed	1×10^{-5} essential
Runway threshold, precision approaches	0.25 m surveyed	1×10^{-8} critical
WGS-84 geoid undulation at runway threshold, precision approaches	0.25 m surveyed	1×10^{-8} critical
Runway centre line points	0.25 m surveyed	1×10^{-8} critical
Taxiway centre line/parking guidance line points	1 m surveyed	1×10^{-5} essential
Obstacles in Area 2 (the part within the aerodrome boundary)	3 m surveyed	1×10^{-5} essential
Obstacles in Area 3	0.5 m surveyed	1×10^{-5} essential
Distance measuring equipment/precision (DME/P)	3 m surveyed	1×10^{-5} essential

Note: See Annex 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Table A-3: Declination and magnetic variation

Declination/variation	Accuracy Data type	Integrity Classification
Aerodrome magnetic variation	1 degree surveyed	1×10^{-5} essential
ILS localizer antenna magnetic variation	1 degree surveyed	1×10^{-5} essential
MLS azimuth antenna magnetic variation	1 degree surveyed	1×10^{-5} essential

Table A-4: Bearing

Bearing	Accuracy Data type	Integrity Classification
ILS localizer alignment	1/100 degree surveyed	1×10^{-5} essential
MLS zero azimuth alignment	1/100 degree surveyed	1×10^{-5} essential
Runway bearing (True)	1/100 degree surveyed	1×10^{-3} routine

Table A-5: Length/Distance/Dimension

Length/distance/dimension	Accuracy Data type	Integrity Classification
Runway length	1 m surveyed	1×10^{-8} critical
Runway width	1 m surveyed	1×10^{-5} essential
Displaced threshold distance	1 m surveyed	1×10^{-3} routine
Stopway length and width	1 m surveyed	1×10^{-8} critical
Clearway length and width	1 m surveyed	1×10^{-5} essential
Landing distance available	1 m surveyed	1×10^{-8} critical
Take-off run available	1 m surveyed	1×10^{-8} critical
Take-off distance available	1 m surveyed	1×10^{-8} critical
Accelerate-stop distance available	1 m surveyed	1×10^{-8} critical
Runway shoulder width	1 m surveyed	1×10^{-5} essential
Taxiway width	1 m surveyed	1×10^{-5} essential
Taxiway shoulder width	1 m surveyed	1×10^{-5} essential
ILS localizer antenna-runway end, distance	3 m calculated	1×10^{-3} routine
ILS glide slope antenna-threshold, distance along centre line	3 m calculated	1×10^{-3} routine
ILS marker-threshold distance	3 m calculated	1×10^{-5} essential
ILS DME antenna-threshold, distance along centre line	3 m calculated	1×10^{-5} essential
MLS azimuth antenna-runway end, distance	3 m calculated	1×10^{-3} routine
MLS elevation antenna-threshold, distance along centre line	3 m calculated	1×10^{-3} routine
MLS DME/P antenna-threshold, distance along centre line	3 m calculated	1×10^{-5} essential

APPENDIX B

MOVEMENT AREA CONDITION REPORT

The conditions on the movement area shall be reported to the AIS in a format containing data as follows. If more than one runway is in use, separate report shall be sent for each runway.

A - Aerodrome Location Indicator
The aerodrome ICAO indicator (four letters).

B – Time
The time of observations and measurement. Year (four digits) and eight digits date/time group UTC. Example: 2003-02160830.
If friction level shall be reported, the time shall be from when measurement starts.

C – Runway
The lower runway designator number (2 digits), independent of runway in use.

D – Cleared runway length
If cleared runway length is more than 10% shorter than published take-off run available (TORA), new TORA shall be reported in meters.

E – Cleared runway width
If cleared runway width is more than 10% smaller than published width, new runway width shall be reported. If offset left or right of centre line, add “L” or “R” in order from the threshold having the lower runway designation number.

F – Runway surface
The conditions on the runway surface shall be reported using a code or a combination of codes for each third of the runway in order from the threshold having the lower runway designation number. The item shall always be filled in, and the following code shall be used:

NIL	-	Clear and dry
1	-	Damp
2	-	Wet
3	-	Rime or frost
4	-	Dry snow
5	-	Wet snow
6	-	Slush
7	-	Ice
8	-	Compact or rolled snow
9	-	Frozen ruts or ridges

If necessary, a suitable combination of these codes shall be used to indicate varying conditions over the runway segments. If more than one deposit is present on the same segment, they shall be reported in sequence form the top to the bottom. Additional information may be reported in plain language under item T.

G – Mean depth
The mean depth of the deposits of loose snow of slush reported under item F, shall be reported in millimetre to an accuracy of 20 mm for dry snow, 10 mm for wet snow and 3 mm for slush, and rounded upwards which means that wet snow between 10 and 20 mm shall be reported as 20 mm. If the depth of snow or slush is not possible to measure or of no operational significance, the letters XX shall be reported.

H – Friction
The level of friction on a runway may be reported for each third of the runway as viewed from the threshold having the lower runway number, and only the numbers 5, 3 or 1 shall be used. The meaning of the numbers shall be:

Friction Level Number	Runway Friction Coefficient	Pilot reported Braking Action
5	0.40	GOOD
3	0.30	MEDIUM
1	0.20	POOR

If an accepted friction measuring device is available and the conditions are within those acceptable to the measuring device, the reporting of friction shall be based on measured friction as follows:

5	GOOD Friction level 0.40 and above

3	MEDIUM Friction level 0.30 – 0.39
1	POOR Friction level 0.20 – 0.29

If an accepted friction measuring device is not available and/or the conditions are not within those acceptable to the measuring device, the level of friction may be assessed by a qualified person.

If neither a qualified person nor an accepted friction measuring device is available the level of friction shall not be reported.

J – Critical snowbanks
If present, height in centimetres and distance in meters from the edge of the runway shall be reported, followed by left (L) or right (R) side or both sides (LR) as viewed from the threshold having the lower runway designation number.

K – Runway lights
If runway edge lights are obscured, "YES" followed by left (L) or right (R) side or both sides (LR)) as viewed from the threshold having the lower runway designation number shall be reported.

L – Further clearance
If greater length than reported under item D and/or greater width than reported under item E will be cleared, new length and/or width in meters shall be reported, or "TOTAL" if the runway will be cleared to full dimensions.

M – Further clearance completed
The time when further clearance is expected to be completed shall be reported using eight digits date/time group UTC.

N – Taxiway surface
The conditions on the surface of all taxiways open for use shall be reported using the same code as for the runway, item F. If a taxiway is closed, "CLOSED" shall be reported.
Example:
TWY A – NIL
TWY B – 4
TWY C - CLOSED

P – Taxiway snowbanks
If there are snowbanks higher than 60 centimeters on a taxiway or taxiway shoulder open for use, then the taxiway designation followed by "YES" and the distance between the snowbanks in meters shall be reported. If there is a snowbank only on one side, the distance between the snowbank and the opposite taxiway edge shall be reported.
Example: TWY A – YES – 22.

R - Apron surface
The conditions on the surface of all aprons open for use shall be reported using the same code as for the runway, item F. If an apron is closed, "CLOSED" shall be reported.
Example:
APRON TERMINAL 1 – 8
APRON TERMINAL 2 – 4
APRON GA – CLOSED

S – Next report
The time for when the next movement area condition report can be anticipated, shall be reported using eight digits date/time group UTC.

T – Remarks
The item T shall be used as follows:

1. *Uncleared part of the runway*
   If item D is used, the difference between the published TORA and the cleared length under item D shall be reported in full meters.

2. *Contamination*
   The contamination of snow, slush, ice etc. (ref. item F) shall be reported according to the following scale (for each third of the runway in sequence from the threshold having the lower runway number):
   10 % If less than 10 % is contaminated
   25 % If 11-25 % is contaminated
   50 % If 26-50 % is contaminated
   100 % If 51-100 % is contaminated

3. *Treatment of the runway*
   Sanding: YES or NO

De-icing: YES or NO. If YES either solid, liquid or urea shall be reported.
Anti-icing: YES or NO.

4. *Marking on snow*
   YES or NO shall be reported. If YES type of marking shall be reported; CL, TWYCL, RWY Edge, THR. Example: YES: CL, THR.

5. *Runway temperature*
   The runway temperature may be reported. If there is more than one sensor the temperatures shall be reported in sequence from the threshold having the lower runway number.

6. *Remarks*
   Describe in plain language any information of operational significance.

Significant changes
A new movement area condition report shall be forwarded to the ATS if one or more of the following conditions are observed or measured:

D – Cleared runway length
The cleared runway length has changed more than 10% of published TORA.

E – Cleared runway width
The cleared runway width has changed more than 10% of published runway width.

F – Runway surface
The conditions have changed in a way that makes another code necessary on at least one of the thirds of the runway.

G – Mean depth
Mean depth on at least one of the thirds of the runway has changed.

H – Friction
The conditions on at least one of the thirds of the runway have changed so that:
- the conditions are no longer acceptable to the measuring device,
- measured friction level has changed 5 digits or more,
- estimated friction level has changed 1 digit or more.

N – Taxiway surface
The conditions have changed in a way that makes another code necessary on at least one of the taxiway.

P – Taxiway snowbanks
Snowbanks higher than 60 centimeters are now present or the height of a reported snowbank is reduced below 60 centimeters or the distance between the snowbanks has changed 1 meter or more.

R – Apron surface
The conditions have changed in a way that makes another code necessary on at least one of the aprons.

T - Remarks

1. *Uncleared part of the runway*
   Item D has been changed.

2. *Contamination*
   A new percentage is necessary on at least one of the thirds of the runway (10%, 25%, 50% 100%).

3. *Treatment of the runway*
   One of the alternatives has changed form YES to NO or vice versa.

4. *Marking on snow*
   A change from YES to NO or vice versa.

5. *Runway temperature*
   One of the sensors has changed more than 2º.

6. *Remarks*
   Any change that is vital or important out of experience or local procedures.

SECTION 2

SUBPART E – AERODROME DATA

IEM GAR 1.E001 Aerodrome data : General

1 Information on the specifications governing the quality system of the aeronautical information service is given in ICAO Annex 15, Chapter 3.

2 Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity, protection and traceability) is contained in the World Geodetic System -1984 (WGS-84) Manual (Doc 9674). Supporting material in respect of the provisions of Appendix 5 related to accuracy and integrity of aeronautical data, is contained in RTCA Document DO-201A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-77, entitled Industry Requirements for Aeronautical Information.

3 An appropriate reference frame is which enables WGS-84 to be realized on a given aerodrome and with respect to which all coordinate data are related.
Specifications governing the publication of WGS-84 coordinates are given in ICAO Annex 4, Chapter 2 and ICAO Annex 15, Chapter 3.

AMC GAR 1.E010 Aerodrome and runway elevation

Geoid undulation must be measured in accordance with the appropriate system of coordinates.

IEM GAR 1.E020 Aerodrome dimensions and related information

1 This information may best be shown in the form of charts such as those required for the preparation of aero- nautical publications as specified in Annexes 4 and 15.

2 See ICAO Annex 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 2 and 3.

3 ICAO Annex 15 provides requirements for obstacle data determination in Area 2 and 3.

4 Implementation of ICAO Annex 15 provision 10.6.1.2 concerning the availability, as of 18 November 2010, of obstacle data according to Area 2 and 3 specifications would be facilitated by appropriate advanced planning for the collection and processing of such data.

AMC GAR 1.E025 Strength of pavements

1 If necessary, PCNs may be published to an accuracy of one-tenth of a whole number.

2 Different PCNs may be reported if the strength of the pavement is subject to significant seasonal variation.

3 The standard procedures for determining the ACN of an aircraft are given in the ICAO Aerodrome Design Manual, Part 3. For convenience several aircraft types currently in use have been evaluated on rigid and flexible pavements founded on the four sub-grade categories in 2.6.6 b), and the results tabulated in that manual.

4 If the actual construction is composite or non- standard, include a note to that effect (see examples below). The following examples illustrate how pavement strength data are reported under the ACN-PCN method:
4.1 Example I.- If the bearing strength of a rigid pavement, resting on a medium strength subgrade, has been assessed by technical evaluation to be PCN 80 and there is no tyre pressure limitation, then the reported information would be:
PCN 80/R/B/W/T
4.2 Example 2.- If the bearing strength of a composite pavement, behaving like a flexible pavement and resting on a high strength subgrade, has been assessed by using aircraft experience to be PCN 50 and the maximum tyre pressure allowable is 1.OO MPa, then the reported information would be: PCN50/F/A/Y/U
Note.- Composite construction.
4.3 Example 3.- If the bearing strength of a flexible pavement, resting on a medium strength subgrade, has been assessed by technical evaluation to be PCN 40 and the maximum allowable tyre pressure is 0.80 MPa, then the reported information would be: PCN40/F/B/0,80MPaT
4.4 Example 4.- If a pavement is subject to a B747-400 all-up mass limitation of 390,000 kg, then the reported information would include the following note.
Note.- The reported PCN is subject to a B747-400 all-up mass limitation of 390,000 kg.

5 Criteria should be established to regulate the use of a pavement by an aircraft with an ACN higher than the PCN reported for that pavement in accordance with 1.E025 (b)and (c).

6 ICAO Annex 14 Vol I, Attachment A, Section 19 details a simple method for regulating overload operations while the ICAO Aerodrome Design Manual, Part 3 includes the descriptions of more detailed procedures for evaluation of pavements and their suitability for restricted overload operations.

7 Example of presentation of Maximum allowable aircraft mass and Maximum allowable tyre pressure : 4 000 kg/O.50 MPa.

AMC GAR 1.E030 Pre-flight altimeter check location

1 A pre-flight check location should be located on an apron.

2 Locating a pre-flight altimeter check location on an apron enables an altimeter check to be made prior to obtaining taxi clearance and eliminates the need for stopping for that purpose after leaving the apron.

3 Normally an entire apron can serve as a satisfactory altimeter check location.

IEM GAR 1.E035 Declared distances

Guidance on calculation of declared distances is given in ICAO Annex 14 Vol I, Attachment A, Section 3.

IEM GAR 1.E040 Condition of the movement area and related facilities.

d) The intent of these specifications is to satisfy the SNOWTAM and NOTAM promulgation requirements contained in Annex 15.
Guidance on determining and expressing the friction characteristics of snow- and ice-covered paved surfaces is provided in Annex 14 Vol I Attachment A, Section 6.

IEM GAR 1.E050 Coordination between aeronautical information services and aerodrome operators

1 Of a particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the aeronautical information regulation and control (AIRAC) system, as specified in Annex 14 Vol I Annex 15, Chapter 6 and Appendix 4.

2 Specifications for the issue of a NOTAM and SNOWTAM are contained in Annex 15, Chapter 5 and Appendices 6 and 2, respectively.

3 AIRAC information is distributed by the AIS at least 42 days in advance of the AIRAC effective dates with the objective of reaching recipients at least 28 days in advance of the effective date.

4 The schedule of the predetermined internationally agreed AIRAC common effective dates at intervals of 28 days, including 6 November 1997 and guidance for the AIRAC use are contained in the ICAO Aeronautical Information Services Manual (Doc 8126, Chapter 2.