AIRPORTS AUTHORITY OF INDIA

Department of Aerodrome Safeguarding

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AERODROME SAFEGUARDING CIRCULAR (ADSAC) 04 OF 2022

Subject: Processing of NOC Applications for height clearance for Airport Equipment, Essential Navigation Aids Located Near Runways, Taxiways and Apron and CNS (Communication, Navigation and Surveillance) Equipment/facilities located/to be installed in operational area inside Airports.

1. Introduction

1.1 At airport various Airport Equipment, Essential Navigation Aids and CNS (Communication, Navigation and Surveillance) Equipment/facilities are to be installed in operational area inside Airports. Some visual and non-visual aids (e.g. approach lighting towers, meteorological equipment, radio navigational aids) are located near runways, taxiways and aprons, where they may present a hazard to aircraft in the event of accidental impact during landing, take-off or ground manoeuvring. All such equipment antenna and shelters should be frangible and mounted as low as possible to ensure that impact does not result in loss of control of the aircraft.

1.2 The frangibility is achieved by use of lightweight materials and/or the introduction of break-away or failure mechanisms that enable the object to break, distort or yield under impact.

1.3 Obstacles to be made frangible

1.3.1 Obstacles are defined as fixed objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a surface intended to protect an aircraft in flight. The first objective should be to site objects so that they are not obstacles. Nevertheless, certain airport equipment and Radio Navigation Aids, because of their function, must be located in an operational area. All such equipment and installations as well as their supports should be of minimum mass and frangible as far as practically possible in order to ensure that impact does not result in loss of control of the aircraft.

1.4 Any equipment or installation required for air navigation purpose installed near runways, taxiways and apron may not be evaluated through NOC Application System (NOCAS) as whole runway strip is incorporated as "No Construction Zone". Also, Obstacle Free Zone (OFZ) system (Inner Approach, Inner Transition and Balk Landing) are not incorporated in NOCAS.

1.5 For a precision approach runway, the OFZ shall be kept free from fixed objects other than light weight frangible mounted aids to air navigation, which must be near the runway to perform their function.

2. Purpose

To define processing the cases of Airport Equipment, Essential Navigation Aids and CNS (Communication, Navigation and Surveillance) Equipment/shelter/facilities located/ to be installed in operational area inside Airports by concerned DoAS offices for timely processing and issuance of No Objection Certificate.

3. Scope / Applicability

3.1 This ADSAC applies to all Airports for which AAI is responsible for Aerodrome Safeguarding, vide the provisions of GSR 751(E)/770(E), as amended from time to time.

4. Cancellation

Aerodrome Safeguarding Circular 09 of 2020.

5. Effective date

5.1 This ADSAC will be effective from the date of its issue.

6. **Obstacle Free Zone**

6.1 The Inner Approach, Inner Transitional and Balked Landing Surfaces (collectively referred as Obstacle Free Zone or OFZ).

6.2 Obstacles Free Zone shall be established for a runway equipped with precision approach (ILS) category II and III operations. The zone shall be kept free from fixed objects other than air navigation aids, which must be near the runway, to perform their function, mounted on light weight frangible fixtures.

6.3 The dimensions and slopes of the Obstacles free zone (Code 3 and 4) are given below.

6.3.1 The inner approach surface

Width	120 meters
Distance from Threshold	60 meters
Length	900 meters
Slope	2%

6.3.2 The inner transitional surface

Slope	33.3%

6.3.3 Balked Landing Surface

Length of the Inner edge	120 meters
Distance from Threshold	1800 meters
Divergence	10%
Slope	3.33 %

7 Siting of Equipment in Operational Area and their Frangibility Requirement

(As per GSR 751 (E) as amended vide GSR 750 (E) and DGCA CAR Section 4 Series 'B' Part I, Aerodrome Design and Operations)

7.1 Any equipment or installation required for air navigation purposes which must be located:

(a) On that portion of the runway strip within:

(i) 75 meters of the Runway centre line where the Runway code is 3 or 4; or

(ii) 45 meters of the Runway centre line where Runway code is 1 or 2; or

(b) on a runway end safety area, a taxiway strip or within the distances specified in CIVIL AVIATION REQUIREMENTS SECTION-4, SERIES 'B', PART I Aerodrome Design and Operations, or

(c) on a clearway and which would endanger an aircraft in the air, shall be frangible and mounted as low as possible.

7.2 Any equipment or installation required for air navigation purposes which must be located on or near a runway strip of precision approach Runway ILS category I, II or III and which:

(a) is situated on that portion of the runway strip within 77.5 meters of the runway centre line where the code number is 4 and code letter is F; or

(b) is situated within 240 meters from the end of the runway strip and within:

(i) 60 meters of the extended runway centre line where Runway code is 3 or 4; or

(ii) 45 meters of the extended runway centre line where Runway code is 1 or 2; or

(iii) penetrates the inner approach surface, the inner transitional surface or the balked landing surface, shall be frangible and mounted as low as possible.

8 DGCA CAR Series 'B' Section 4 Part I on Aerodrome Design & Operations, Vol.1, Chapter 9 specifies Airport equipment and installations which, because of their particular air navigation function, have to be located in an operational area include:

(a) Wind direction indicators;

(b) Localizer equipment of Instrument landing system (ILS) along with its antenna array and Near Field (NF)/Far Field (FFM) monitoring antenna;

(c) Glide Path of Instrument landing system (ILS) along with its antenna and monitoring antenna;

(d) Low Power DME antenna co-located with ILS Glide Path equipment;

(e) Radar Reflectors;

(f) Anemometers;

(g) Ceilometers;

(h) Transmissometers;

(i) Forward-scatter meters;

(j) Fencing;

In addition to above, following CNS Equipment/ Facilities located/to be installed in the operational Area or at the roof top of ATC Tower/ATS Complex/ Fire watch Tower.

(k) DVOR Antenna along with its monitoring antenna

(l) High Power DME antenna.

(m) ADS-B Antenna System.

(n) RCAG Antenna System.

(o) VHF Antenna System.

(p) ASR/MSSR.

(q) A-SMGCS/SMR.

(r) MLAT.

(s) Microwave/UHF Link.

(t) INRES.

(u) GBAS.

(v) HF Tx/Rx Antenna of SAR Frequency.

(w) Any other CNS installations as required to be installed.

9 Standard Siting of ILS (Localizer and Glide Path) and Aviation Weather Observation System (AWOS)

9.1 Guidance or specifications on the siting of navigational aids are contained in Annex 10 — *Aeronautical Communications,* Volume I — *Radio Navigation Aids,* and DGCA CAR Section 4 Series 'B' Part I on Aerodrome Operations and Design and their related manuals. These should be taken into account when siting navigational aids. In general, equipment and security fencing should be sited as far away from the runway and taxiway centre lines as practicable.

9.2 ILS Localizer

9.2.1 The preferred location for the localizer antenna array is on the extended runway centre line beyond the far end of the runway. This location permits the radiated on-course signal to overlie the runway centre line. The following factors govern site selection:

(a) Coverage requirement;

(b) Type of localizer array;

(c) Obstacles or vertical reflecting surfaces within the desired localizer coverage volume;

(d) Obstacle clearance and missed approach criteria;

(e) Location of monitoring antenna; and

(f) Technical siting considerations.

9.2.2 A maximum height of 4.8 meter for the Localizer antenna system (including lightening protection system) may be permitted with respect to runway end level so as not to penetrate the Approach Surface of the opposite runway, if Localizer antenna system is located at a longitudinal distance of 300 meter or more from the runway end.

9.2.3 A height of 4.8 meter above nearest runway end elevation of the LLZ shelter may be permitted so as not to penetrate the Approach/transitional surface of the opposite runway.

9.3 ILS Glide Path Antenna System

9.3.1 The lateral displacement of the ILS glide path antenna system should not be less than 120m with respect to the runway centre line. The longitudinal location should be selected to place the ILS reference datum as close as possible to the recommended nominal value of 15m above the threshold. In general, the following factors govern site selection:

(a) Desired operating limits with respect to approach speeds and rates of descent of aeroplanes;

(b) The position of obstacles in the final approach area, the aerodrome sector and the missed approach areas, and the resulting obstacle clearance limits;

(c) Runway length available;

(d) Location of monitoring antenna; and

(e) Technical siting considerations.

9.3.2 A maximum height of 17 meters of the GP antenna and Collocated LP DME may be permitted above the elevation of the threshold of the runway for which the ILS is planned, so as not to penetrate the Inner Transitional Surface if;

(a) The GP antenna is located laterally at a distance of 120m or beyond from runway centre line; and

(b) The elevation of the GP site and of the threshold of the runway, for which the ILS is planned, are same.

9.4 Aviation Weather Observation Systems (AWOS)

9.4.1 The following guidelines should be followed by the India Meteorological Department (IMD) and the Airport Management for the selection of AWOS sites at the airports:

9.4.1.1 To protect the obstacle free zone, the Met Park of size 10M x 50M should be located between 105M and 120M from the runway Centre line with in a distance of 500M from runway threshold.

9.4.1.2 However, to protect LLZ signal propagation, all such installation, including the mast should not subtend elevation angle of more than 0.75° within +/- 10° azimuth and elevation angle of more than 1.1° within +/- 10° to 35° azimuth in front of LLZ antenna, (for example the location of the mast should be minimum 500M from LLZ antenna if the maximum mast height is 6M, above LLZ site elevation or 765M if the maximum mast height is 10M).

9.4.1.3 The Met Park shall not be located in front of the Glide Path.

9.4.1.4 The AWOS or Airport Meteorological Instruments should be installed beyond the No Construction Zone (NCZ) of Localizer / Glide Path.

9.4.1.5 The AWOS or Airport Meteorological Instruments shall be mounted on frangible masts as per the guidelines given in ICAO Doc. 9157 Aerodrome Design Manual Part 6-Frangibility.

9.4.2 IMD Officials shall submit the details of location of AWOS containing its height, route of Power cable, site plan etc. to the concerned Airport Director in accordance with the guidelines mentioned in Para 9.4.1. The concerned APD or CEO of the airport, as the case may be, shall facilitate the IMD for the selection of the AWOS site in consultation with Aerodrome Safeguarding Team of the Airport.

10 Height determination and Processing of NOC applications

10.1 For AWOS, planned to be installed as per the siting criteria of 9.4, Airport Director of AAI airport or CEO of a Private /Joint Venture airport, as the case may be, whose Aerodrome Safeguarding Team is actively involved in the site selection process, may approve the site selection on the recommendation of the Aerodrome Safeguarding Team.

10.2 Air Navigation Aids, as stated at para 8, planned to be installed as per the standard siting criteria, as defined in Para 9, may be processed by the Directorate of CNS Planning - II for site approval on the recommendation of the concerned Technical Site Selection Committee, comprising of officers from Directorate of CNS-Planning, RCDU and CNS-O&M as duly approved by the Executive Director (CNS-P-II).

10.3 For other CNS equipment installed in operational area as listed in Para 8, Airport operator/Project manager, after finalization of site shall get the surveyed data like Site Coordinates, Site Elevation and Required Height (AMSL) for the Equipment/ Facility and their support for issuance of NOC by concerned RNOCC.

10.4 After Finalization and Survey of site for data as detailed in Para 10.2 and Para 10.3, Project Manager/Airport operator shall apply in NOCAS Portal for obtaining NOC from concerned RNOCC.

10.5 Airport operator/Project Manager shall initiate an e-File mentioning details of the facilities, its location, whether it's an existing facility, replacement or New facility and respective NOCAS ID for information and processing the case and forward it to the Designated Officer (DO) of concerned RNOCC for offline/manual processing of case.

10.6. When the Project Manager/Airport operator applies for SACFA clearance on Saral Sanchar portal for WOL (wireless operating license) without obtaining prior NOC from DoAS, such cases shall be forwarded by project manager to the Designated Officer (DO) of concerned RNOCC through E- File or other suitable means by stating the reasons and details like SACFA ID/ WPC acceptance number for processing the case.

11 Processing of the cases of Airport Equipment and CNS equipment/facility by DoAS offices.

11.1 Applications for issuance of NOC of Airport Equipment, Essential Navigation Aids located near runway are to be processed offline, as OFZ surfaces are not incorporated in NOCAS. The members of the RNOCC may send such case to offline NOCC by disagreeing with the NOCAS height giving comment "Airport Equipment or Essential Air Navigation equipment".

11.2 Other CNS equipment/facility located in operational area as listed in Para 8, are also to be processed by concerned DoAS office through offline if requested top elevation are not cleared as per normal process.

12. Processing of NOC/SACFA cases of Airport Equipment, Essential Navigation Aids and CNS facilities located/to be installed in operational area by CNS user of concerned RNOCC.

12.1 Processing of NOC/SACFA cases of a replacement CNS facility: If the height of a proposed CNS facility is only restricted by the existing CNS facility, which is being replaced, the height restriction due to the existing facility shall be removed by disagreeing in NOCAS and putting remark "replacement of the facility is cleared for requested top elevation".

12.2 Provision of CNS Simulation Study: If the requested top elevation of an airport equipment, CNS facility or structure being proposed by the airport Operator within the airport premises, is restricted by one or more CNS facilities (other than para 12.1), then CNS simulation study may be carried out as per ADSAC 02 of 2022. However, no simulation study will be required for ILS equipment if it is getting restricted from any other ILS installations. No simulation study will also be required for antenna masts having diameter less than one feet.

12.3 All NOC/SACFA cases except essential facility as mentioned in para 8 falling within ± 18° for medium aperture sector/ ± 15° for wide aperture sector of CAT-II/ CAT-III Localizers and 1050 meter from threshold shall be processed for Multipath Study.

12.4 NOC /SACFA cases for the CNS facilities (VHF/RCAG/ADS-B/ UHF Link /SMR) located on the roof top of ATC Tower/ ATS Complex/ Fire watch Tower and getting restricted from each other will be cleared from CNS point of view.

13. Validity: This ADSAC will remain valid till it is amended or withdrawn or incorporated in the Aerodrome Safeguarding Manual.

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14. Document Control and feedback: This ADSAC has been issued by the office of ED (ATM) with the concurrence of Directorate of CNS-O&M/Directorate of ASM. Any feedback, suggestion or the error in this document may be brought into the notice of GM (DoAS), CHQ, AAI CHQ at gmdoaschq@aai.aero.

29/07/2022.

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