

United Kingdom Overseas Territories Aviation Circular

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Control of Cranes and Other Temporary Obstacles

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GENERAL

Overseas Territories Aviation Circulars are issued to provide advice, guidance and information on standards, practices and procedures necessary to support Overseas Territory Aviation Requirements. They are not in themselves law but may amplify a provision of the Air Navigation (Overseas Territories) Order or provide practical guidance on meeting a requirement contained in the Overseas Territories Aviation Requirements.

PURPOSE

The purpose of this OTAC is to offer guidance to the aerodrome certificate holder to manage and control the use of cranes and other temporary obstacles on or in the vicinity of the aerodrome.

RELATED REQUIREMENTS

This Circular relates to OTAR Part 139 and, where applicable, OTAR Parts 140, 171, 172 and 178.

CHANGE INFORMATION

Minor editorial changes incorporated at Issue 3.

ENQUIRIES

Enquiries regarding the content of this Circular should be addressed to Air Safety Support International at the address on the regulator website www.airsafety.aero or to the appropriate Overseas Territory Aviation Authority.

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1 Introduction

Aerodrome safeguarding ensures the safety of aircraft and their occupants when in the vicinity of an aerodrome by controlling potentially hazardous activity, development and obstacles around it.

As with any tall structure, the presence of a single crane or number of cranes has the potential to affect aviation activities. Generally, crane-related issues are considered and managed in much the same way as for any tall structure. However, because cranes can be erected at very short notice, a potential air navigation obstacle can therefore appear suddenly presenting a serious hazard to air navigation, particularly as, during the approach and departure phases of flight, aircraft are at low altitudes.

Also, depending on the location of a crane, it has the potential to reach across an Airside or SRA boundary (where applied) and the security implications of this, in respect of personnel or materials being lifted across a boundary, must be considered.

The use of cranes or tall equipment can occur during construction projects and maintenance work (eg placing or removing of air conditioning units on/from building roofs). In both cases the same principles apply. Therefore, the reader should understand that descriptions relating to construction work may apply, equally, to maintenance tasks.

Safeguarding, in respect of a proposed development, may not end with the grant of planning permission, and conditions may be applied to any planning permission granted.

For construction projects, if it is not already in place, the setting up of, or amendment to, an MoU or LoA with the local planning authority may be beneficial to establish an appropriate control protocol/procedure between the aerodrome certificate holder and planning authority.

2 Cranes and tall construction equipment

The key to ensuring hazards and security risks are avoided is to enable consultation between the Aerodrome Certificate Holder and the equipment operator at the earliest practical opportunity. This will allow any particular issues to be identified at an early stage before any construction/maintenance commitments are made, so avoiding wasted time, money and resource.

Note that, in the case of construction, this assumes that a full and proper planning control and consultation process has taken place prior to any works starting.

Any flight safety implications might be mitigated by co-ordinating crane and aircraft operations and by advance notification of the crane to the aerodrome certificate holder/operator (and through them to pilots and air traffic control). In some cases, the fitting of obstacle lighting may be sufficient mitigation. ICAO Annex 14, Volume 1 sets out the requirements.

There may be occasions during a project where the need arises for tall equipment that was not planned for. In those cases, the responsible person (see Section 3) should contact the Aerodrome Certificate Holder to allow proper and full assessment of the work to be carried out BEFORE starting any 'crane/tall equipment' activity.

3 Responsibilities

Aerodrome Certificate Holder

The Aerodrome Certificate Holder must take all reasonable steps to ensure that the aerodrome and the airspace within its visual traffic pattern is safe at all times for use by aircraft. In other words, the Aerodrome Certificate Holder must take all reasonable steps to ensure obstacles are not introduced which may be a hazard to aircraft in flight or, if it is unavoidable, steps are taken to ensure the hazard is adequately safeguarded, notified or procedures changed to protect aircraft operations.

The Aerodrome Certificate Holder must take all reasonable steps to ensure that the siting of a crane does not permit a security breach of the airside or SRA boundary.

When the Aerodrome Certificate Holder becomes aware of any unauthorised crane or tall equipment activity within the vicinity of the aerodrome, under the requirements of the Air Navigation (Overseas Territories) Order¹, he has the obligation to take action that protects flights arriving and departing from the aerodrome (this may include the stopping of flight operations) pending assessment of the identified unauthorised hazard.

Local Planning Authority

The planning authority should also ensure that, any applications for construction or work that includes the use of tall equipment within the aerodrome traffic zone², is notified to the Aerodrome Certificate Holder to enable consultation and assessment in case the work introduces any activity that may present a hazard to aircraft operations.

Construction Project Manager/Supervisor/Equipment operator

Any person considering work on the airfield or within the aerodrome traffic zone that involves tall equipment should consult the Aerodrome Certificate Holder/Airfield Manager for permission to work. This is to identify whether or not the proposed work includes activity or the use of tall equipment (cranes etc) that could be a hazard to aircraft operations.

If it is expected or known that a crane will be required on or in the vicinity of an aerodrome the project manager/developer should contact the aerodrome, ideally a minimum 6-8 weeks before the crane (or other tall construction equipment) is anticipated to be on site. This should allow adequate time to assess the impact of the work and undertake appropriate consultation.

It may be beneficial for the Airport Management team to maintain a close working relationship with planning authorities with regards to safeguarding aerodrome operations. This will ensure a common understanding of current and future developments that may involve tall construction equipment. Guidance, such as this OTAC, should be shared with relevant stakeholders.

¹ Amongst other requirements, Article 155 of the Air Navigation (Overseas Territories) Order (AN(OT)O) requires that a person in charge of the operation of an aerodrome in the Territory secures the aerodrome and the airspace within which its visual traffic pattern is normally contained are suitable and safe for use by aircraft.

An Aerodrome Certificate Holder must take all reasonable steps to ensure that the aerodrome and the airspace within which its visual traffic pattern is normally contained are safe at all times for use by aircraft.

² "aerodrome traffic zone", in general terms, means the area bounded by a circle centred on the mid-point of the longest runway and having a radius of 2 nautical miles (3.704km) or 2½ nautical miles (4.630km) if the runway length is greater than 1850m.

4 Procedure

The main areas of safety and security concern are that the crane or tall structure may:

- be an obstacle to the air navigation of aircraft; or
- interfere with navigation/communication equipment; or
- affect instrument flight procedures; or
- reach across an Airside or SRA boundary.

Many aerodromes have a procedure for issuing an Authorisation Permit for the operation of cranes and other tall construction equipment on or in the vicinity of the aerodrome. The Aerodrome Certificate Holder may wish to consider whether a permit system for the control of cranes or tall equipment should be introduced.

Once construction details have been finalised, a formal application for the authorisation/permit is made before the crane or other tall construction equipment arrives on site. Adequate time must be allowed to enable the Aerodrome Certificate Holder to assess any impacts the equipment may have on airport operations and to undertake appropriate consultation. Lead times for submission and assessment should be agreed on a case-by-case basis or as covered in the LoAs/MoUs.

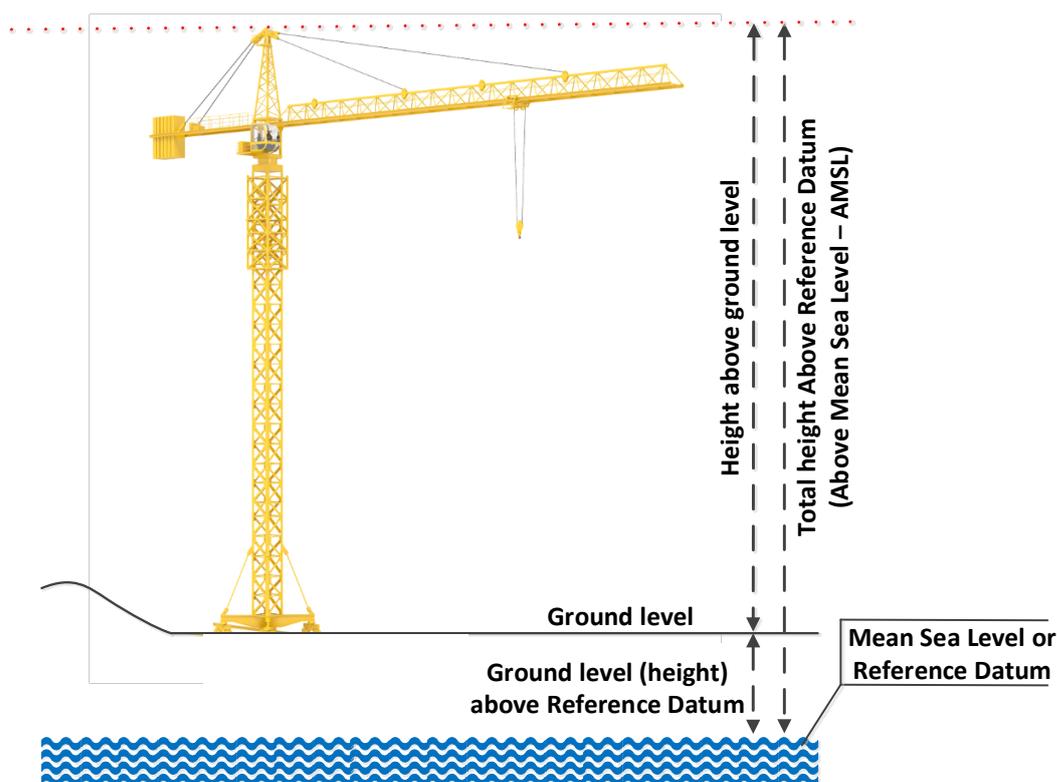
Figure 1 – Examples of various types of crane and tall equipment





To apply for a permit or written permission (authorisation), the following details will be required:

- The **exact location** of the centre of the crane, as a topographical survey grid reference (using the local reference system), or marked on a map showing the topographical grid;
- The **type** of crane/equipment (eg tower crane, mobile crane, concrete pourer/pump, pile driver etc. See Figure 1, for examples);
- The **maximum operating height** in metres Above Ordnance Datum (AOD), or the height of crane Above Ground Level (AGL) plus ground level in AOD (see Notes and Figure 2, below);
- The **radius** of the jib/boom of a fixed crane/the area of operation of a mobile crane;
- How the jib/boom will be orientated when not in use;
- Will the crane be fitted with obstacle lighting;
- Wind limitations;
- The intended **dates** and **times** of operation;
- Applicant's name and contact details.

Figure 2 – Illustration of Reference Datum/Mean Sea Level

Note 1: Heights Above Reference Datum are those shown on topographical survey maps as “Above Mean Sea Level” (AMSL). See Figure 1.

Note 2: If a crane is located on top of another structure, it is the overall height (structure + crane) above reference datum that is relevant.

These details enable assessment of the proposed operation, using the aerodrome’s Safety Management System, to determine whether the operation can proceed and whether restrictions will be applied.

If the work is agreed, written authorisation (a permit or letter) will set out any appropriate restrictions (see Section 6). A copy of the authorisation should remain with the crane for the duration of its operation and must be produced if requested by an aerodrome official or a police officer.

5 Interference with navigation/communication equipment and Instrument Flight Procedures (IFPs)

Assessment may identify that a crane (or other tall equipment) is likely to interfere with navigation/communication equipment and/or Instrument Flight Procedures (IFPs). If this is the case, appropriate mitigations should be applied. Some of the mitigations listed in Section 6 are applicable to this situation, and may include any of the following:

- Restrictions on crane/equipment operating height;
- Operations dependent on the runway(s) in use;
- Restrictions on crane/equipment operating times;
- Removal of IFP;

- Change to IFP (eg raising of obstacle clearance height, daytime only, increased separation);
- Flight checks to establish impact

Some further information is contained in Appendix A.

6 Control of obstacles

Following an assessment, if the crane (or other tall equipment) is an obstacle to aircraft, any of the following may be imposed to ensure the safety of aircraft:

- The fitting of obstacle lights (requirements are set out in ICAO Annex 14 Volume 1, Chapter 6);
- Restrictions on crane/equipment operating height;
- Operations dependent on the runway(s) in use;
- Restrictions on crane/equipment operating times;
- Restrictions during adverse weather (whether caused by fog, low cloud or heavy rain etc);
- A Notice to Airmen (NOTAM);
- An efficient and rapid method of communication between the crane operator and ATC (eg a handheld radio or cellphone) to enable equipment lowering, if needed.

Where the design of the crane allows, it should be lowered when not in use, or when requested by an aerodrome official, such as during periods of adverse weather. Where it cannot be lowered, it may be necessary for the jib to be parked in a particular direction when not in use. In some circumstances, the aerodrome may require the type of crane to be used as one capable of being lowered.

When it has been determined that the obstacle requires lighting, the characteristics for the light(s) should be specified by the aerodrome certificate holder based on the requirements of Annex 14 Volume 1, Chapter 6.

As a general rule, obstacle lighting should be visible from all directions and located on the highest point of the crane/equipment and give some definition of the obstacle. For example, for a tower crane, lighting should be provided on top of the tower and at the end of the jib and should be illuminated at all times.

Unserviceable obstacle lights should be replaced as soon as possible after failure and in any event within 24 hours; during this time the aerodrome should be contacted so that a notice (to pilots and air traffic control – NOTAM) can be issued.

7 Reaching across Airside or SRA boundaries

Following an assessment, if the crane (or other tall equipment) has the potential to reach across an airside or SRA boundary then relocation to an alternative site that would prevent this should be considered.

If this is not possible then the following measures might be appropriate:

- Restrictions on crane operating radius or reach;
- Observation by airport security personnel;
- The jib to be parked in a particular direction when not in use.

If the intention is that the crane will be used to lift materials across the Airside or SRA boundary, in either direction, then airport security must be present during such operations to ensure that the materials are screened appropriately and that there is no breach of security.

8 Construction Management Plan

For work close to an aerodrome or under approaches to its runways, it may be necessary for the developer to produce a Construction Management Plan to be agreed by the aerodrome certificate holder. This is to ensure that construction does not prejudice the safe operation of the aerodrome. A work management plan (sometimes called a method statement) might be required as part of any planning permission that may be granted.

The plan should address, but be not limited to, the following elements:

- Use of cranes or other tall construction equipment; and
- Control of activities likely to produce dust or smoke clouds; and
- The design of temporary lighting to avoid distracting pilots; and
- Storage of materials, particularly compliance with height limits; and
- Control and disposal of waste, to prevent attraction of birds; and
- impact on any radar or other navigational aids; and
- storage of materials in compliance with height limitations; and
- Site management, to prevent attraction of birds through standing water and earthworks.

See also OTAC 139-26 – Aerodrome Development Projects.

Appendix A Navigation/communication equipment and Instrument Flight Procedures (IFPs)

The following provides some further advice regarding the potential implications for IFPs and aeronautical telecommunication systems. Clearly, these assessments should be carried out before any potential obstacle is allowed.

IFPs

IFPs are designed using surfaces prescribed by ICAO Doc 8168 Aircraft Operations (PANS-OPS). PANS-OPS surfaces are entirely different from the Annex 14 Obstacle Limitation Surfaces (OLS).

PANS-OPS surfaces are not geographically fixed in relation to an aerodrome but are configured specifically for a location so as strictly to be above all obstacles. Conversely OLS surfaces are generic to every aerodrome and penetrating obstacles should be removed as far as is practicable.

The Aerodrome Certificate Holder is the IFP owner and as such, is accountable for ensuring that the PANS-OPS design surfaces are not penetrated. Consequent to the IFP approval process, the aerodrome will possess the design data specifying the PANS-OPS surfaces. The IFP Design Data will enable the aerodrome to determine whether a new obstacle (temporary or fixed/permanent) is in proximity to the PANS-OPS surfaces.

However, due to PANS-OPS complexity, it is likely that the IFP Design Organisation will need to be engaged to establish whether there is a penetration. Any PANS-OPS surface penetrations will require the IFP to be promulgated as unusable temporarily or requiring redesign and probable operational penalty.

Aeronautical Telecommunication Systems

Aeronautical telecommunication facilities (Communication, Navigation and Surveillance) all have the potential to be interfered with by physical objects. This may be physical line-of-sight shielding, 'bending', reflecting or altering the performance of the signal with a subsequent impact on integrity, accuracy availability or continuity.

The effects may be sufficient to prevent a service meeting the operational requirement, for example rendering a position approach service dangerously inaccurate. Failure to meet performance criteria will require the related service to be removed.

The size, position and material of the obstacle will all have independent and varying impacts on aeronautical telecommunication systems. In such cases it is necessary to ensure that the aeronautical telecommunication service provider is informed and consulted together with all other parties who may be affected. The results of the consultation may require further investigations including a flight check (regardless of whether the obstacle be temporary or permanent).

It is also possible that a further flight check will be required once a temporary obstacle is removed to ensure the aeronautical telecommunication facility is operating correctly.

By virtue that a crane is being used for construction, regard should be given to any constructions that permanently remain, as they could similarly and permanently cause all of the effects referred above.