

Guidance to crane operators on aviation lighting and notification

Introduction

As with any tall structure, the presence of a single crane or number of cranes has the potential to affect aviation activities. In the main, crane-related issues are considered and managed in much the same way as for any tall structure. However because cranes can be erected at extremely short notice, a potential air navigation obstacle can therefore appear at very short notice. Accordingly, in some respects cranes are assessed in a different light.

This guidance, which fundamentally draws upon already published material, aims to provide the construction industry with a summary of:

- The crane-related aviation issues (as acknowledged by the Construction Plant-hire Association (CPA) within a related Technical Information Note, TIN 039 '**Operating Tower Cranes in the Vicinity of Aerodromes, Notification and En-route Obstacle Lighting**', available at <http://www.cpa.uk.net/p/Tower-Crane-Interest-Group/>. There is direct read across between the CPA TIN and this CAA guidance document.)

- Existing regulation,
- The duty of care expectations placed upon the crane user (contractor),
- Recommended best practice aimed at mitigating any aviation risk generated by crane operations.

This guidance draws on previously published material and is aimed at any crane user.

The principal areas of concern:

- Crane activity in the vicinity of an aerodrome,
- Any aviation warning lighting requirement (aerodrome-associated or otherwise) and,
- The potential requirement for crane activity to be notified to the aviation community.

Clearly, the scale of potential impact will principally depend upon location, particularly in relationship to any nearby aerodrome and the crane heights involved. Note that if a crane is located on top of another structure, it is the overall height (structure + crane) above ground level that is relevant.

Crane activity in the vicinity of an aerodrome

The operation of cranes in the vicinity of any aerodrome could present a serious hazard to air navigation, particularly as, during the approach and departure phases of flight, aircraft are at low altitudes. In addition to the creation of an air navigation obstacle, cranes could also interfere with navigation and/or communication equipment. Any flight safety implications might be mitigated by co-ordinating crane and aircraft operations through the advance notification of the crane to relevant aerodrome licence holders/operators (and through them pilots and air traffic control) and in some cases the fitting of aviation warning lighting.

To that end, Civil Aviation Publication 738 (Safeguarding of Aerodromes) and British Standard Institute Code of Practice for the safe use of cranes (BS 7121, Part 1) each indicate that the crane user (contractor) should consult with local aerodrome managers for permission to operate a crane:

“The appointed person should consult the aerodrome/airfield manager for permission to work if a crane is to be used within 6 km of the aerodrome/airfield and its height exceeds 10m or that of surrounding structures or trees, if higher.”

As is additionally highlighted in BS 7121 aerodrome-related restrictions may be imposed

on the overall height of the crane and there could be an aerodrome-related need for any crane to be equipped with aviation warning lighting. Any restriction on operations will be for the relevant aerodrome operator to dictate. Similarly, the relevant aerodrome operator will dictate any requirement for nearby cranes to be equipped with aviation warning lighting; for civil aerodromes, any such lighting specification should comply with the requirements of CAP 168 – Licensing of Aerodromes. CAP 168 can be downloaded from the CAA website at www.caa.co.uk/docs/33/CAP168.PDF - chapter 4, paragraph 12.8 refers to obstacle lighting.

The Construction Plant-hire Association Technical Information Note (TIN) provides guidance to the crane user (contractor) on establishing the presence of any aerodrome that may be in close proximity to any crane operating site. The TIN also highlights that;

‘the responsibility for notification to aerodromes and/or the CAA, together with the lighting of tower cranes, rests with the hirer of the crane (principal or other contractor), however the supplier of the crane should assist the hirer by reminding him of his obligations.’

Aviation warning lighting

For background, it might be useful for crane operators/suppliers to understand that:

- In the UK, the need for aviation obstruction lighting on ‘tall’ structures depends in the first instance upon any particular structure’s location in relationship to an aerodrome. As indicated above, if the structure constitutes an ‘aerodrome obstruction’ it is the aerodrome operator that will review the lighting requirement.
- Away from aerodromes Article 219 of the UK Air Navigation Order 2009 applies. This Article requires that for en-route obstructions (ie away from aerodromes) lighting is required for structures of a height (measured above ground level) of 150 meters (492 feet) or more. However, structures of lesser height might need aviation obstruction lighting if, by virtue of their location and nature, they are considered a significant navigational hazard.

- Cranes, whether in situ temporarily or long term, are captured by the bulleted points highlighted immediately above.
- A headline CAA Policy Statement concerning the lighting of en-route obstacles is available http://www.caa.co.uk/docs/33/DAP_LightingEnRouteObstaclesAndWindTurbines.pdf

The need for warning lighting depends upon not only height but location. Whilst ideally cases should be assessed on a case-by-case basis, generically:

- If the crane is close enough for there to be an aerodrome issue, any lighting requirement will be dictated by the relevant aerodrome licence holder/operator. The crane user (contractor) should liaise direct with relevant aerodrome operators in line with the guidance above.
 - Article 219 sets out the requirement for “en-route” structures (ie those away from the vicinity of a licenced aerodrome) to provide aviation warning lights for structures of a height of 150 meters or more. Generically Article 219 (Article 219 is at Section 1 Part 28 Page 1 of the UK Air Navigation Order, available at <http://www.caa.co.uk/docs/33/CAP393.pdf>) requires that medium intensity (generically 2000 candela) steady red lights be mounted as close as possible to the top of the structure and at intermediate levels not exceeding 52 metres. Such lighting should be displayed at night (‘Night’ is defined for civil aviation purposes as the time from half an hour after sunset until half an hour before sunrise) and be visible from all directions (In all cases care should be taken to ensure that the superstructure of the crane does not obscure the aviation warning lighting from any particular direction.) Any request associated with a proposal to employ a reduced lighting specification should be discussed with the CAA Safety and Airspace Regulation Group.
- Away from the immediate vicinity of an aerodrome and where the maximum crane height is less than 150 meters aviation warning lighting is not a legal requirement. However, given the likelihood that such cranes will be amongst the tallest structures in any given location the CAA recommends that, in order to ensure that the crane operator fulfils his duty of care towards others, the crane user (contractor) considers using aviation warning lighting in line with the following:
 - Cranes that are between 90 meters and 150 meters (approximately 300 – 500 feet) high being equipped with medium intensity steady red lighting positioned at the highest point and both ends of the jib, such that the lighting will provide an indication of the height of the crane and the radius of the crane jib. Such lighting, which should be displayed at night, should be positioned so that when displayed it is visible from all directions.
 - Cranes that are 60 meters to 90 meters (approximately 200 – 300 feet) high being equipped with low intensity steady (generically 32 candela) red lighting positioned as close as possible to the highest point and, for tower cranes, to the top of the fixed structure. Such lighting, which should be displayed at night, should be positioned so that when displayed it is visible from all directions.

The CAA encourages crane users to liaise directly with local aerodrome licence holders/operators. However, where any crane is expected to extend to a height of 90m or more, to assist crane operators the CAA will, upon request, attempt to provide comment, guidance or recommendation on a case-by-case basis. Appropriate contact details are available below.

Notification

Upon receipt of information provided by crane operators concerning the presence of cranes in the vicinity of an aerodrome, the aerodrome operator/manager will appropriately notify aerodrome users as required.

In addition to any aerodrome-specific requirement to advertise the presence of any crane, there is (for civil aviation purposes) a mandated requirement to promulgate all known structures of a height (i.e. above ground level) of 300 feet (91.4 meters) or more regardless of location.

Therefore, as well as liaising with local aerodromes, users (contractors) of cranes that have a maximum height of 300ft or more need to additionally provide the crane's precise location, an accurate maximum height and start/completion dates, to the CAA and the Defence Geographic Agency as follows:

- Cranes that are expected to be in situ for periods up to 90 days will be deemed as being temporary structures that can be notified through the means of a Notice to Airmen (NOTAM). To arrange a NOTAM relating to a crane of a height of 300ft or more, a crane user (contractor) should contact the CAA's Airspace Utilisation Section (ausops@caa.co.uk / 0207 453 6599) in advance of the crane's erection.
- The user (contractor) of any crane that is expected to be on site for in excess of 90 days should provide details of the crane(s) to the Defence Geographic Centre (DGC) which maintains the UK's master database of tall structures (the Digital Vertical Obstruction File). The notification and charting of all permanent structures of a height of 300ft or more draws on information recorded in the DGC-managed DVOF. The importance of ensuring the accuracy and completeness of DVOF cannot be over emphasised. DGC point of contact details 0208 818 2702 / dvof@mod.uk.

Points of contact

Civil Aviation Authority: Head of Airspace Regulation
Safety and Airspace Regulation Group
Civil Aviation Authority
CAA House
45-59 Kingsway
London
WC2B 6TE

e-mail: airspace@caa.co.uk
telephone: 0207 453 6545

Whilst it would be impractical to include contact details for crane-related enquiries at all aerodromes, given the volume of development in and around the central London area, the following contacts will be of use:

Heathrow: e-mail: peter_hayashi@heathrow.com
telephone: 07713 075349

London City Airport: e-mail: safeguarding@londoncityairport.com
telephone: 0207 646 0006 / 0203 203 2523

London Heliport: e-mail: s.hutchins@londonheliport.co.uk
telephone: 0207 228 0181