CONTRACTORS

Use of drones in quarries

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Key Points

Drones, also known as Remotely Piloted Aircraft Systems (RPAS) have become an increasingly popular tool for various industries, including quarrying. Their ability to capture high-quality aerial footage and collect valuable data has revolutionised the way quarries operate.

Overview

This guidance is designed to assist quarry operators and appointed persons understand some of the rules regarding the use of drones, help them understand some of the terminology around drone flights and associated risk assessments provided by drone contractors.

Using this guidance

Use this guidance to inform your policies and procedures with dealing with drone related activities.

You can refer to this guidance should you need to induct a drone contractor onto your site to carry out drone related activities.

Useful references

Resources

HSE Link

Managing risks and risk assessment at work

Government link

Drones: how to fly them safely and legally

Civil Aviation Authority link

Introduction to drone flying and the UK rules.

The Air Navigation Order

including the 2018 amendment and 2019 amendment.

The Civil Aviation Authority has published a copy of the Air Navigation Order with amendments inserted.

Guidance

This guidance covers the following scenarios.

1. **Quarry operator contracts a commercial drone operator to carry out work.**
2. **An employee of the company requests to fly a drone over the quarry site.**
3. **A member of the public or another organisation requests to fly a drone over the quarry site.**
4. **An unexpected drone is observed flying over the quarry site.**

1. Quarry operator contracts a commercial drone operator to carry out work.

When employing any contractor to carry out work in the quarry, it is normal for them to provide the relevant risk assessments, method statements, health and safety documents, competence information, licenses and have the appropriate insurances in place.

A drone contractor must comply with the rules as set out by the Civil Aviation Authority (CAA), it is the CAA who will investigate and take any action following an incident involving a drone or Remotely Piloted Aircraft Systems (RPAS) however, you would still follow your normal process and procedures following any accident or incident.

What should you expect to see from a drone contractor?

They will be able to provide a valid operator ID and a flyer ID (The drone will have a label showing the Operator ID as well)

They will have the relevant Insurances in place (Drone specific insurance EC785/2004)

They will be able to provide a Pre-deployment risk assessment and method statement and will conduct a dynamic risk assessment once on site.

They must have authorisation from the quarry operator and/or land owner.

For your own knowledge and CPD it is worth asking the drone operator to explain the airspace hazards that may be above your site, see the glossary below for some of the terms that are associated with airspace hazards.

Inductions: Drone flights can be impeded by weather conditions, a contractor as part of their pre-flight preparation will have monitored weather patterns, wind speeds as well as other factors, they will know that they have a window of opportunity to conduct a successful and safe flight.

It would be beneficial to carry out as much of the contractor induction process as possible, prior to the day of the flight so the contractor can carry out the flight operation during this window.

An employee of the company requests to fly a drone.

We first need to establish:

1. Will the employee be using their own drone for their own pleasure.
2. Will the employee use a drone provided by the employer?

For scenario 1 we need to understand the level of risk, work through the following questions:

1. Are you intending to fly a fixed wing drone (like a model plane) as opposed to a rotary drone (helicopter type)? YES/NO
2. Does the drone weigh more than 1.5kg including the battery? YES/NO
3. Has the drone been modified in any way or have some form of attachment? YES/NO
4. Will the flying be over any land that is not within the company's control (i.e. flying outside of the site boundary)? YES/NO
5. Will the flight be any closer than 5km from any airfield, airport, dense urban area, nuclear site, prison or military base? YES/NO
6. Are you intending on flying over the majority of your site; as opposed to only flying over part of the site such as the stockyard or a face? YES/NO
7. Will you be flying any higher than 100m YES/NO
8. Are you intending to fly any closer than 150m from the general public, 3rd party buildings or 3rd party infrastructure (e.g. roads, railways or above ground services)? YES/NO
9. Will you be flying within 50m of any person who has not been briefed of the flight? YES/NO

If the answer was YES to any of these questions, then the flight is within a high-risk category. If the answers were all NO, then the flight could be viewed as low risk.

The recommendation from the industry working group who wrote this guidance is that personal drones should not be flown over the operational site.

For scenario 2 the employer should recognise that they are the operator of the drone, therefore should consider all the company process, procedures and ensure they have the correct insurances in place.

A member of the public or another organisation requests to fly a drone over the quarry.

Great, they have made a sensible move by contacting the organisation. If you have drone operations occurring in the quarry at the same time, the answer should be no, not on that occasion

and explain that you have drone operations already occurring. (See appendix 241) The responsibility is on the drone operator to comply with the rules. (see supplement for members of the public) Remember that the member of the public can easily step outside of the site boundary and fly the drone over the site without your permission, so as they have approached you, its best to work with them.

Note: Deploying and flying in airspace already being used by site operations could be a breach of the Air Navigation Order 2016 and reportable to the Civil Aviation Authority

An unexpected drone is observed over the quarry. (For example, self-proclaimed auditors or YouTube vloggers)

This can be more problematic, as you have no legal basis to stop the flight. If anyone observes an unexpected drone flying over your quarry and you have drone contractors operating on your site, the "approved" drone operator must be informed immediately so they can land their equipment safely. If you believe the unexpected drone is a fly away (meaning the remote pilot is no longer in control) or operated in a reckless manner, you may wish to contact your quarry staff and ask them to seek cover until the drone has left the area. Even a small drone can cause significant injuries due to the high speed of the blades or a catastrophic failure leading to uncontrolled vertical fall to ground.

The remote pilot of the unexpected drone "should" be nearby (see glossary for visual line of site VLOS) if they are inside your site boundary, you can, without interfering with their operation of the drone, ask them to cease the flight activity and proceed as you would with any trespasser. If they are outside the boundary, you have no legal powers to stop the flight. Whilst you could try to find the remote pilot and, without interference, ask them to cease the flight activity, it is unlikely they will comply.

Note: Deploying and flying in airspace already being used by site operations could be a breach of the Air Navigation Order 2016 and reportable to the Civil Aviation Authority

As part of the supplements to this guidance, the working group have produced a design for a sign that could be displayed around your site, this sign raises awareness that drone operations may be occurring within the site.

Industry experience with individuals found to be flying drones in this manner are seeking attention or ideally, a form of confrontation with site management, this may be linked to posting footage of the interaction on internet video channels such as YouTube. This, in turn trying to generate revenue for the creator of the video. (see supplement to this guidance)

Appendix

The **Air Navigation Order 2016**

Endangering safety of an aircraft

241. A person must not recklessly or negligently cause or permit an aircraft to endanger any person or property.

Glossary

CAA - Civil Aviation Authority

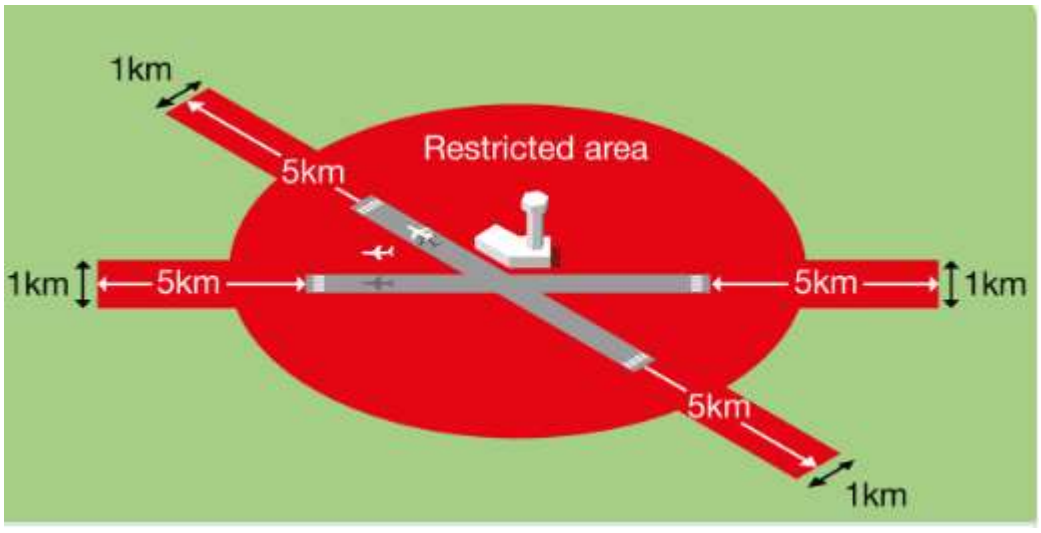
BVLOS - Beyond Visual Line of Sight. (See VLOS)

DRONE - A drone is a type of aircraft that does not require a human pilot onboard; typically controlled using a remote control or onboard computer.

FIXED WING –fixed wing is more like a traditional aircraft with fixed wings and a propulsion system.

FPV - First Person View lets you see live footage from the drone in real-time, usually through VR goggles, a smartphone, or a tablet screen.

FRZ – Flight Restriction Zone - Most airports, airfields and spaceports have a flight restriction zone (FRZ). Never fly in this zone unless you have permission from the airport, airfield or spaceport.



GIMBAL - A unique camera mount that allows movement, such as tilts and swerves, using servos. It will enable stable camera footage regardless of the drone's movements resulting in sharp and smooth images or videos.

GPS – Global Positioning System. A system that tracks and identifies the position of an object with respect to the global spatial plane. Usually used to track the movement or hold the position of a drone

LiDAR – Light Detection and Ranging. Also called active laser scanning. A technology that uses a pulsing laser that plots an object's three-dimensional topography in maps. It is usually mounted on GPS-enabled drones to collect geographical data.

No-fly zone - Areas where it is prohibited to fly drones as per the government's mandate or any local governing body. Typically, No-Fly Zones include airports and other private areas.

PinS - Point-in-Space (PinS) helicopter operations. Could apply to Low altitude helicopter flights to inspect power lines etc.

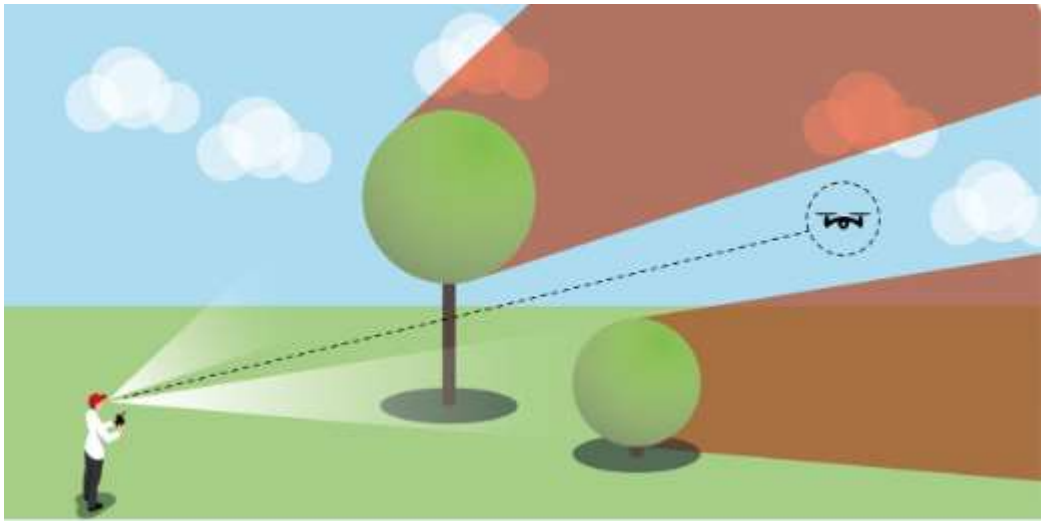
RPAS – Remotely Piloted Aircraft System

SPOTTER - A Spotter is another person that keeps your drone within line-of-sight when the pilot is in FPV. They usually identify obstacles and hazards that you might not see in FPV.

UAS (legacy term) - Unmanned Aerial System, combines an unmanned aerial vehicle (UAV) with additional components and payloads.

UAV (legacy term) - Unmanned Ariel Vehicle. Drone. A drone is a type of aircraft that does not require a human pilot onboard; typically controlled using a remote control or onboard computer.

VLOS – Visual Line of Sight. Refers to the pilot's view from the ground to the drone without the use of any artificial vision such as goggles or displays.



Should you encounter a situation that is not covered by this guidance, you can use the get involved form on the QNJAC website to send a question to the working group or if you have one, contact your organisations drone "Accountable Manager"

The Health and Safety Executive (HSE) provides support to QNJAC in producing guidance, which is aimed at improvements within the industry. As detailed in this guidance, the operation and flying of drones in the UK is regulated by the Civil Aviation Authority and is outside of HSE's remit. However, as a quarry operator under the Quarries Regulations 1999, you should make reasonable enquiries as to the competence of drone pilots.