

UNMANNED AIRCRAFT SYSTEM (DRONE / UAV) OPERATIONS – MANAGING THE OPERATIONAL RISKS

1 PURPOSE

This process has been introduced to describe the operating arrangements and to mitigate risk of uncontrolled operation of Unmanned Aerial Vehicles (UAVs / Drones) being operated near, on or over Network Rail infrastructure.

This standard is in alignment with the following:

- Air Navigation Order (ANO) (Articles relating to unmanned aircraft operations).
- Civil Aviation Authority (CAA) Guidance Publication CAP 722.
- European Aviation Safety Authority (EASA) or other regulatory requirements as appropriate.

2 SCOPE

This process outlines requirements on the management of risks associated with the operation of drones or UAVs near, on or over Network Rail infrastructure and mandates:

- a) Minimum requirements of operating organisations.
- b) Minimum competency requirements for unmanned aircraft operators.
- c) Minimum equipment requirements.
- d) Proximity to Network Rail Infrastructure.
- e) Notification arrangements.
- f) Accident reporting.

This standard applies to any individual or organisation wishing to operate drones or UAVs near, on or over Network Rail infrastructure.

3 DEFINITIONS

For the purpose of this standard, the following terms and definitions apply:

ANO – Air Navigation Order	The ANO forms the legal foundation for almost all areas of civil aviation that are still regulated at national level.
BVLOS – Beyond Visual Line of Sight	For operations beyond visual line of sight, it is not possible for the operator to directly see the unmanned aircraft and avoid other aircraft or objects. Therefore alternative arrangements to prevent collisions must be taken. In these cases, the aircraft must either be fitted with a Sense – and – Avoid system or, in the absence of such a system; it must be operated within Segregated Airspace. Contact the Network Rail Air Operations team for further advice.

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CAA – Civil Aviation Authority	The CAA is the statutory corporation which oversees and regulates all aspects of civil aviation in the United Kingdom.
CAP 722	Guidance published by the CAA which is intended to assist those who are involved in all aspects of drone operations.
Congested Area	This is defined in relation to a city, town or settlement: any area which is substantially used for residential, commercial, industrial or recreational purposes. Specific permission(s) from the CAA must be obtained to operate in a congested area.
EASA – European Aviation Safety Agency	The agency of the European Union (EU) with regulatory and executive tasks in the field of civilian aviation safety.
EASA – European Aviation Safety Agency	The agency of the European Union (EU) with regulatory and executive tasks in the field of civilian aviation safety.
Framework Agreement for Unmanned Aircraft Systems	Approved suppliers within the Network Rail supply chain who are contracted to provide services detailed within the agreement. For a list of current approved suppliers, contact the Network Rail Air Operations team.
MOR – Mandatory Occurrence Reporting	A MOR scheme governed by European Regulations.
MTOM – Maximum Take-off Mass	The MTOM of a drone is the maximum weight at which the operator is allowed to attempt to take off due to structural or other limits.
Near, on or over Network Rail infrastructure	Operating from, over or closer than 50m to any Network Rail infrastructure, people, buildings or structures.
Network Rail Infrastructure	Infrastructure and land that is owned by Network Rail but possibly leased to another party, or under the control of another party.
Operations Manual (As defined in CAP 722)	Document produced by the operator, or his / her organisation which details who the operator is, the drone and any related equipment that will be used for operations, how the drone will be operated and the safety management system that will be used to ensure safe operations are undertaken. This is a mandatory requirement to obtain permission from the CAA.
OSC – Operational Safety Case (CAOSC – Congested Areas Operational Safety Case)	An approval granted (by the CAA) which allows drone operators to undertake works in congested areas. Drones of 7kg or less are not required to use the OSC for standard permission (this implies keeping at least 50m clear of third parties etc.)

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Permission	An approval granted by the CAA upon successful completion of a CAA certified Ground School, written examination and flight test.
UAV (Unmanned Aerial Vehicle) / Drone	An aircraft (or aircraft system) that is flown from a remote location without a pilot located in the aircraft itself. CAA further defines this as 'Small unmanned aircraft' which means any unmanned aircraft, other than a balloon or a kite, having a mass of not more than 20kg without its fuel but including any articles or equipment installed in or attached to the aircraft at the commencement of its flight.
VLOS – Visual Line of Sight	VLOS is termed as being the maximum distance at which the flight crew is able to maintain separation and collision avoidance, under the prevailing atmospheric conditions, with the unaided eye (other than corrective lenses). Within the UK, VLOS operations are normally accepted out to a maximum distance of 500m horizontally and 400ft vertically, from the operator. These parameters are maximum and entirely dependent on visibility and weather conditions at the time.

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MINIMUM OPERATING REQUIREMENTS FOR INDIVIDUALS / ORGANISATIONS IN ACCORDANCE WITH CAP 722 OF THE AIR NAVIGATION ORDER

Any individual or organisation wishing to operate drones or UAVs near, on or over Network Rail infrastructure shall demonstrate to the Air Operations Programme Assistant that they have the following in place as a minimum before undertaking any drone or UAV operations:

- Current [CAA] Permission supported by an approved operations manual.
- Approved [CAA] qualification(s) of operator competence.
- Notification to the Network Rail Air Operations team.
- An authorised risk assessment / method statement / safe system of work that shall be approved by the client:
- Risk management arrangements.

NOTE: Attention should be paid to the following risks:

- Boundary ownership
- Moving trains / line speeds
- Electrification and lineside hazards (overhead line equipment, conductor rails etc.)

- Public Liability Insurance – minimum £5 million for drone operations on or near the railway (often referred to by the insurer as 'Railway Work').
- Compliance with the Data Protection Act.
- Compliance with Network Rail's Life Saving Rules.

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5 MINIMUM COMPETENCY REQUIREMENTS FOR UNMANNED AIRCRAFT OPERATORS IN ACCORDANCE WITH CAP 722 OF THE AIR NAVIGATION ORDER

Any individual or organisation, wishing to operate drones or UAVs near Network Rail infrastructure shall demonstrate to Air Operations Programme Assistant their competency through the following minimum requirements:

- Approved [CAA] qualification(s) of operator competence.
- Current records of flight operations.
- Evidence of flying currency.
- Competency assessments as detailed in their operations manual.
- Operational Safety Case (OSC) for any proposed congested area operations.

6 MINIMUM EQUIPMENT REQUIREMENTS

Any drone or UAV which is to be used by any individual or organisation near Network Rail Infrastructure shall meet the following minimum technology requirements:

- Return to home capability, such that system failures will always result in the drone returning to a safe landing zone.
- System technology of a sufficiently robust standard to comply with their granted CAA permission and approved Operations Manual.
- The Maximum Take-Off Mass (MTOM) including fuel shall not exceed 7kg unless pre agreed with Network Rail Air Operations and signed off in the task specific risk assessment at least six weeks prior to the proposed tasking. An authorised risk assessment / method statement / safe system of work shall be signed off by the client.

7 PROXIMITY TO NETWORK RAIL INFRASTRUCTURE

Only authorised employees and suppliers approved under the Framework Agreement for Unmanned Aircraft Systems and drone operators permitted by the Network Rail Air Operations team shall be permitted to fly over or closer than 50m to Network Rail infrastructure. All operations shall be within Visual Line of Sight (VLOS).

Beyond Visual Line of Sight (BVLOS) operations shall not be undertaken without the express authority of Network Rail Air Operations.

8 NOTIFICATION ARRANGMENTS

Drone operators wishing to fly over or closer than 50m of Network Rail infrastructure shall contact the Air Operations Programme Assistant on

DroneEnquiries@networkrail.co.uk

no less than 10 working days prior to proposed operation start date.

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9 ACCIDENT REPORTING

In addition to any regulatory or mandatory occurrence reporting process(es) (MOR), drone operators shall have a system in place to immediately notify the Network Rail Route Control, National Operations Centre (NOC) and Programme Assistant of any accidents, incidents or occurrences.