

Specific Operations Risk Assessment UIC Drone4Rail Workshop



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Project overview

UIC SORA – Scope of the project

 Pilot training

 Operational procedures

 Technical requirements

| Objective of the project

- Develop a standardised framework for performing inspection of bridges and other objects around railway tracks
- In accordance with EASA drone regulation
- Published by UIC for use in Europe

| Close collaboration within Drone4Rail WP2

| **In progress:** coordination with EASA for official publication (PDRA)

Concept of Operations

Example scenario: inspection and mapping of railway infrastructure



- | ConOps: Who, what, where, when, with what?
 - Inspection of bridges, buildings near railway, other railway elements
 - Two types of operations: close-up manual and mapping of object
 - Within Visual Line Of Sight: longer distance possible through PDRA-G03
- | Operational volume: overflowed ground area and used airspace
 - Example of complex bridge over the river Waal near Nijmegen
 - Bridge connecting sparsely populated area with a populated area, located in uncontrolled airspace (controlled airspace possible)



Ground Risks

Risk in the railway environment



- | Drones with a maximum dimension of 3 meters and a maximum take-off mass of 25kg
 - Operated within Visual Line Of Sight (VLOS) over a controlled ground area (e.g. in cities) or sparsely populated areas (e.g. industrial areas, farmland, nature areas, etc.)
- | A controlled ground area means:
 - That only involved people are present in the area of operation; or
 - That people are aware of the operation, informed of the risk and have (implicitly) accepted these
- | As a general reference, an area with a maximum of 300 people per Km² may be considered a sparsely populated area
- | The operator should have an Emergency Response Plan, containing a plan to limit the escalating effects of a crash and the conditions to alert Air Traffic Control in case of a fly away

Air Risks

Preventing collisions in the air



- | The described types of operations (inspections) are by definition performed close to objects
 - Therefore the operations take place in so called Atypical Airspace, which means airspace within 30 meters (100ft) of an object or within restricted or segregated airspace.
 - Atypical Airspace has the lowest possible Air Risk Class, as no other (manned) aircraft can be expected in these types of airspace
- | Because of the Atypical Airspace, no other strategic mitigations have to be taken (before the flight)
 - The (short) duration of the flight and the time of day (or night) may however further lower the risk
 - Specific rules/requirements or structures for the airspace (e.g. CTR) may also further lower the risk
- | The operator does need to have a deconfliction scheme, stating the steps and phraseology used when a manned aircraft does approach the airspace of operation

Operational Safety Objectives

Operational challenges & developments



- | Depending on the risk level, the SORA sets Operational Safety Objectives: man, machine, organisation
 - Other requirements are applicable: privacy, security, environmental protection, etc.
- | The operator must have an Operations Manual including:
 - Normal, abnormal and emergency procedures to safely, legally and efficiently, plan, execute and log all flights in the railway environment (distance from infrastructure, Venturi effect, EMI, AIRPROX etc.)
- | The flight crew must be trained to perform the type of operations (infrastructure inspections)
 - The training includes basic theoretical and practical training and operation-specific training (e.g. inspection/mapping, ERP, crew coordination, and any training required by the railway administrator)
- | The UAS and other equipment used by the operator must fulfill various requirements:
 - Command and control link performance, limitations of external factors, safety features (e.g. geofence, RTH, obstacle avoidance, flight termination (if applicable), etc.

**Thank you for
your attention!**

Questions?

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