# Safety recommendation no. 591

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| **Date of the publication** | 06.06.2023 |
| **Number of the final report** | 2390 |
| **Safety deficit** | About one minute after take-off at the University of Zurich (UZH) Irchel, the M2 V9 drone automatically triggered the flight termination system (FTS) and initiated an emergency landing. After ejecting the parachute, the connecting rope broke and the drone hit the forest floor without deceleration and was destroyed.<br><br>In the case of a conventional quadrocopter concept with four propulsion units, as was the case with the M2 V9 drone examined here, a failure of one propulsion unit inevitably leads to a crash or at least to the forced triggering of an automatic flight termination system. Propulsion concepts of drones with 6 or more propulsion units show a significantly lower probability of failure in this respect. |
| **Safety recommendation** | The Federal Office of Civil Aviation (FOCA) should ensure that the manufacturer aims to use a redundant propulsion concept – in particular for flights over populated areas – in order to reduce the propulsion-related failure probability due to material wear or exogenous factors such as bird strike. |
| **Addressees** | BAZL Bundesamt für Zivilluftfahrt |
| **Stage of the implementation** | Not implemented – In a letter dated 29 September 2023, the Federal Office of Civil Aviation (FOCA) commented as follows:<br>"The Federal Office of Civil Aviation (FOCA) does not agree with Safety Recommendation (SE) No. 591. The safety recommendation to use a redundant propulsion concept is a simplified approach that does not take into account common cause failures, the complexity of the design of an unmanned aircraft and the associated maintenance risks. Such design recommendations contradict the risk-based approach (SORA), which takes into account all risk mitigation measures and the operational profile that are included in a SORA, which was the basis for the authorisation and has now been adopted by the EU Member States.<br>In addition, the roles and responsibilities of the competent authorities are defined in the Implementing Regulation (EU) 2019/947, or the Applicable Means of Compliance (AMC) 1, Art. 11, para. 1.5 (f): 'According to Regulation (EU) 2018/1139 (the EASA 'Basic Regulation'), EASA is the authority competent in the European Union to verify compliance of the UAS design and its components with the applicable rules, while the authority that is designated by the Member State is competent to verify compliance with the operational requirements and compliance of the personnel's competency with those rules.'<br>Accordingly, the European Union Aviation Safety Agency (EASA) is the competent authority for monitoring compliance with the rules regarding design and continuous airworthiness.<br>In the view of the FOCA, the implementation of the safety |

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| | recommendation is not practicable due to the above-mentioned explanations and contrary to the applicable regulations, the unilateral amendment of which is not possible.<br>For the above reasons, the FOCA considers Safety Recommendation No. 591 to be closed with regard to our office." |
| **Investigation report concerning the safety recommendation** | Zwischenbericht<br>Schlussbericht<br>Final report<br>Vorbericht |

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