A Model for Measuring and Reducing Risks from Drones in Construction

A Practical Model for Measuring and Mitigating Safety Risks of Using UAS in Construction

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Overview

In recent years, Unmanned Aerial Systems (UAS) have become popular in the construction industry due to their versatility and ease of use in data collection. Other benefits of UAS on job sites include cost savings and improved safety. Research has increasingly focused on how UAS can assist on multiple tasks during different construction phases, but the potential negative safety outcomes for construction workers have not been studied adequately. The researchers aimed to begin filling this gap by developing a practical model to establish, assess, and improve mitigation programs that construction companies have for controlling safety risks generated as a result of using UAS. The components of the model–including the safety factors and mitigation methods–were identified, verified, and quantified through a mixed-methods approach that relied on a review of literature and a three-round Delphi process.

Key Findings

- This study identified 23 safety risks associated with using unmanned aerial systems (UAS) on construction job sites and classified them into six categories of causal factors, also referred to as superior-level factors: (1) UAS-related, (2) environment-related, (3) flight crew-related, (4) mission-related, (5) job-site-related, and (6) contractor-related.
- It established the relative importance of the six categories, with UAS-related factors judged as the most significant and the others following in the order listed above.
- For each of the 23 safety risks, the Delphi panel developed ratings for the perceived effectiveness level of 70 mitigation measures.
- The study developed a practical assessment model for measuring and improving safety control programs using a performance index to aggregate all the risk factors and the mitigation methods that can be implemented.

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