

Safety measures for multicopter aerial photo survey

INOUE, Hiroshi^{1*} ; UCHIYAMA, Shoichiro¹ ; SUZUKI, Hinako¹

¹National Research Institute for Earth Science and Disaster Prevention(NIED)

Low-altitude aerial photographing using multicopters, radio-controlled multi-rotor helicopters, became easy for everybody because of their recent technical advancement and price declines of the equipment. The technology will become popular rapidly as one of the methodologies of field surveys. Multicopters, however, can crash into the ground. We have experienced crash or near-crash accidents through our surveys and test flights in the past. The causes are sometimes a simple pilot error, loss of a propeller, unexpected strong wind, and out of battery, and are sometimes unclear, like GPS signal loss and barometer error, and their combinations. The crashes could have made serious injuries if the multicopters hit humans judging from the damage to the equipment we experienced.

The measures we take are careful pre-examination of the flight plan, making propeller guards, knowing battery capacity-flight time characteristics, monitoring battery voltage during the flight, regular maintenance of the batteries, pre-flight equipment checks, acceleration and compass calibrations, communication between the pilot and copilot, full utilization of autonomous flight, training of manual control for emergency, and following the safety check list.

Multicopter survey could cause problems to the society if accidents occur often as the result of popularization. If the usage becomes too strictly regulated, we may limit or even lose the large potential of applying the multicopter technology to our field survey. We therefore need to establish the safety measures to be obeyed, and share experiences of accidents for wider recognition of its potential danger, clarify individual causes, in order to strengthen the measures. Compliance to the aviation and wireless communication laws and regulations are indisputable. We also have to buy an insurance to compensate the possible damage caused by an accident.

