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TESTING, TESTING

WeRobotics Using UAS to Help With Humanitarian Efforts Across the Globe

by Brian Sprowl

Through the use of unmanned aircraft, a not-for-profit organization called WeRobotics is looking to assist humanitarian efforts across the world.

In less than two years of existence, WeRobotics has made an impact on several continents, as they have established local innovation labs, known as Flying Labs, to help train local “social good partners” in Asia (Nepal), Africa (Tanzania), and South America (Peru) in the safe and effective use of unmanned systems.

According to Patrick Meier, the executive director and co-founder of WeRobotics, one of the main motivations behind the launch of the organization was the chaotic and poor UAS response to the Nepal Earthquake in 2015. Meier says that UAS teams that responded to the earthquake were lackluster, largely because of the lack of experience of the teams in international disaster management, their unfamiliarity with the country and its culture, and the inability to speak the native language.

Meier says that the teams did more harm than good, and wanted to make sure that going forward, there would be proper help within the country ready to act whenever disasters struck.

“We wanted to make sure that the next time a disaster hit Nepal,

we would have a WeRobotics Lab in place [Nepal Flying Labs] with trained Nepali UAV pilots equipped with the right skills, experience, technology and software to carry out aerial surveys responsibly and effectively,” Meier tells *Unmanned Systems*.

Since then, WeRobotics and their Flying Labs have provided UAS training and technologies to local communities in Asia, Africa and South America. The technology and training are used to address pressing issues of importance, which vary from location to location, that have been identified by professionals running the Flying Labs, in coordination with other local stakeholders.

In February 2016, WeRobotics conducted an initial scoping mission in Lima, Peru, and determined through multiple meetings with different stakeholders, organizations and experts that there was a strong interest in exploring cargo delivery. Through in depth conversations with the Peruvian Ministry of Health (MoH), WeRobotics learned that there was an area of need for UAS in the Contamana region of the Amazon Rainforest.

In that region, an estimated 45 snakebites occur per month. There is a local clinic in the remote village of Pampa Hermosa, but if that clinic was to run out of antivenom, it would either need to be sent from Contamana, which is the nearest town, or the person suffering



Members of the WeRobotics Peru Flying Lab prep UAS for their December and February flights. Photos: WeRobotics

from the snake bite would have to be sent to the Contamana.

No roads connect the two locations, and the normal mode of transportation – boat or canoe – can take several hours, making UAS use that much more attractive. After formally presenting their project to the MoH and other Peruvian doctors, and receiving strong support from both groups, WeRobotics went to the Civil Aviation Authority and worked with them to obtain flight permissions. Between strong support from the MoH and the fact that the flights were occurring in the middle of the rainforest, over trees and rivers, securing the permission was easier, according to Meier.

After being granted flight permissions, WeRobotics and the Peruvian Flying Lab used a UAS to transport antivenom and blood samples between Contamana and Pampa Hermosa in December 2016. Using the UAS, it took just 35 minutes for the antivenom and blood samples to travel 40 kilometers from one location to another, much faster than the several hours it would take to travel by boat.

“If you were bitten by a snake in the Amazon, would you rather wait 35 minutes or three hours for the antivenom?” Meier asks. “Based on our conversations with doctors in both Pampa Hermosa and Contamana, 35 minutes was stellar for them.”

To conduct the flights, an E384 UAS from Ohio-based drone maker Event 38 was used in place of the original UAS, which was deemed too unstable to fly. The E384, nicknamed Frankie, performed very well despite the fact that it was literally a last minute alternative, and had never been used for cargo delivery before.

“Frankie performed surprisingly well given the circumstances,” Meier says. “We had just hours to prepare and figure things out.”

The E384 was significantly cheaper and older than the original UAS that was supposed to be used, but none of that matters according to Meier, as long as the system gets the job done.

“Humanitarian technology doesn’t have to be sexy, it just has to work,” he says. “Frankie may not look like much, and would probably be dismissed by most. But hey, Frankie worked, at least this time.”

While Frankie performed well during the December flights, it isn’t built to endure every single type of weather condition, such as heavy rain or wind conditions. The weather conditions during the December flights were ideal, making the journey easier. Also, there were only two flights conducted using Frankie, which is not a large enough sample size to determine if a UAS is truly able to handle certain missions.

But that doesn’t mean that Frankie is incapable of handling any missions; instead, it just has to be determined which missions Frankie is best suited for, and what UAS would work for other types of missions.

“It really all depends on what the use-case is,” Meier says. “As such, the question here is not which drone is inherently better. Rather, the question is which drone, under which circumstances, trying to solve which problems, with which partners, under which budget constraints is the most appropriate. The same is true in the aviation industry.”

In February, the WeRobotics team returned to Peru to conduct more tests. These flights, which took place on Feb. 19, didn’t use Frankie; instead, they used another Event 38 drone, the E386, this one dubbed Laura, which was described as Frankie’s “big sister.” Named after the first Peruvian female doctor in the 1800s, Laura has a longer range than Frankie, and performed just as well as its little brother.

During the latest round of testing, the WeRobotics team successfully flew the Laura UAS 75 kilometers from Contamana to Tiruntán, which nearly doubled the traveling distance of Frankie during its December 2016 flights. Laura transported 10 vials of saline solution placed inside of a cold pack, meant to simulate blood transportation.

In May, WeRobotics plans to return to the region to conduct more flights and achieve more goals. The team would like to expand its delivery distance past 100 kilometers, and it would also like to focus on high frequency testing, as they would like to spend 20 days flying nonstop between the key hubs in the Amazon.

WeRobotics is looking to continue its expansion in a number of different companies, as it has secured permission to carry out cargo delivery flight tests in the Philippines between remote islands in one of the country’s poorest districts. They would like to conduct these field tests later on this year, but first have to secure funding in the coming months.

WeRobotics also has potential new projects coming online in the Maldives and Panama.

Wherever they are, Meier believes that WeRobotics will continue to help with humanitarian efforts across the world in the places that need it the most, by giving local citizens the tools necessary to achieve their missions.

“Our hope is that building local capacity around the safe and effective use of drones in high risk areas will lead to more rapid and effective relief efforts,” he says.



Children observe the UAS before takeoff during February flights.
Photos: WeRobotics.