

Bambi Buckets in the Urban Jungle

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Aerial firefighting in New York City requires many of the same skills that are needed elsewhere, as well as a few unique ones.

While the west coast of the U.S. is famous for its large and catastrophic wildfires, many people are surprised to learn that the New York Police Department (NYPD) Aviation Unit is often tasked with suppression of brush fires.

Most people are familiar with New York's office tower "canyons," Times Square and Broadway. However, at 305 square miles, the city also has significant brush in its outer boroughs, and the NYPD Aviation Unit is called to assist the New York Fire Department (FDNY) in fire suppression missions throughout the year. The FDNY has periodically examined starting their own aviation unit, but studies have shown that it would be in large part a duplication of services already provided by NYPD.

THE BAMBI BUCKET MISSION

The NYPD Aviation Unit conducts fire suppression using the Bell 412EP equipped with a 180-gallon Bambi Bucket. The missions are flown at the request of FDNY, always in conjunction with ground operations. Upon request, the Bell 412EP launches with a crew of three: the pilot-in-command, co-pilot and crew chief. Fire suppression is workload intensive, and all crewmembers are tasked with an array of responsibilities. The mission demands excellent crew resource management.

An NYPD ground unit is always dispatched to coordinate operations with the FDNY battalion chief at the scene. Of course, safety is the priority, and the ground coordinator ensures that the drop area is clear of personnel and ground hazards. Even with water, a high risk of injury or death exists if the load is inadvertently dropped on a person.

In addition to the Bell 412EP, an FDNY battalion chief is launched in the NYPD Aviation Unit's A119 Koala. The airborne chief evaluates the water drops for effectiveness and recommends changes as needed to the battalion chief on the ground. Water is taken from any available source; however, it is almost always drawn from the many rivers and bays that cross New York City.

Before drops are begun, the flight crew evaluates the requested drop area for wind direction and any hazards. Several years ago, FDNY was fighting a stubborn brush fire at a long-abandoned landfill. The crew of the NYPD Aviation Unit aircraft was concerned about the smoke as a result of the fire. Instead of the normal colors associated with a brushfire, the smoke was green, purple and red. It was determined that all firefighting operations, including those on the ground, would cease until it could be determined if the smoke was a hazard.

Once the flight crew has evaluated the drop zone and decided to commence fire suppression activities, the mission continues. If the water is to be taken from a navigable waterway, the NYPD Harbor Unit is dispatched to the water pick-up area to clear the site of boaters and marine traffic. The Bell 412E and Bambi Bucket then are guided into a hover by the crew chief, and the water is retrieved. As the water is pulled from the pick-up zone, the flight crew must be aware of weight and balance issues and the

stability of the load. One hundred eighty gallons of water weighs just under 1,500 pounds, and even the Bell's twin PT-6 engines are pushed to their limits during these missions.

The most common effect of taking on such a heavy load too quickly is a small (1 percent) rotor rpm droop. When that occurs, the pilot must carefully and delicately hold the hover and allow the PT-6 to catchup and then continue to fly away. The torque meter must be closely watched as the water is picked up and the aircraft takes on the weight of the load.

As the aircraft approaches the drop zone, wind conditions must be considered, and once again the aircraft is maneuvered into position by the crew chief. At a pre-determined signal, the crew chief orders the water drop. Each drop is affected by the wind, so constant corrections must be made in order to effectively fight the fire.

Usually, after a drop or two, the flight crew is able to adjust to the wind and make all of its drops on target. The location of the drops and the duration of the mission are determined by the FDNY ground battalion chief. The unit's current record is 93 drops in a single mission during a brushfire along the Belt Parkway in Brooklyn.

Upon conclusion of the mission, the aircraft and Bambi Bucket must be thoroughly cleaned, especially if they have been coated with a salt-water spray during the mission.

THE HAZARDS

The Bambi Bucket mission, conducted only during daytime hours for safety, involves significant risks. As with all sling-loads, stability is critical, and the crew chief must constantly relay the state of the load to the pilots. If at any time the bucket should become unstable or entangled on a ground object, the command "shear, shear, shear" is issued and the load is instantly jettisoned.

Another danger is one of "switchology." In addition to an emergency shear, the load can also be dumped via the cargo hook. More than one flight crew has been embarrassed when they inadvertently dumped an entire bucket instead of just dumping the water. Although the urban myth of a fully equipped scuba diver being scooped up by a firefighting aircraft and found in the smoldering ruins of a forest fire is inaccurate, the crew must be aware of hazards in the water, such as debris, ropes and garbage.

Finally, the Bambi Bucket can remain locked when it comes time to dump a filled load. In that case, the crew must delicately lower the filled bucket to the ground, allow the water to spill out and then land to determine the source of the problem.