



County of San Mateo

Inter-Departmental Correspondence

Department: DEPARTMENT OF EMERGENCY
MANAGEMENT

File #: 22-018

Board Meeting Date: 1/11/2022

Special Notice / Hearing: None
Vote Required: Majority

To: Honorable Board of Supervisors

From: Daniel T. Bellville, Director, Department of Emergency Management
Jonathan Cox, Deputy Chief, Fire Department (CAL FIRE)
Nicholas Calderon, Director, Parks Department

Subject: Autonomous Aerial System with Fire Suppression Capabilities Pilot Project

RECOMMENDATION:

Accept staff report and provide direction to the Department of Emergency Management, San Mateo County Fire Department and County Parks on applying for a grant to pilot an autonomous aerial system capable of extinguishing a fire.

BACKGROUND:

Since the 2020 CZU Lighting Complex several County agencies have been working cooperatively on new and innovative ways to more rapidly contain wildfires when they break out in the remote areas of the County. Recently, Department heads have been working to establish a pilot project to attempt to have autonomous unmanned aerial systems, commonly known as drones, reliably fly to a reported location and take suppression action. Over the past year, a pilot project framework has been developed with the Gordon and Betty Moore Foundation and Rain Industries creating the fiscally sponsored Rain Project housed at the Windward Fund.

The Gordon and Betty Moore Foundation was established to create positive outcomes for future generations. In pursuit of that vision, they focus on fostering path-breaking scientific discoveries, environmental conservation, patient care improvements and preservation of the special character of the San Francisco Bay Area.

Rain Industries is a company formed with the mission to develop a system to contain wildfires within 10 minutes of ignition using a network of autonomous aircraft installed in a grid throughout high risk regions. The intent of the Rain System is when an ignition is detected, all aircraft within range will swarm to the ignition coordinates to contain the ignition. The Rain MK2 is a 7.5 foot tall, 4.5 foot wide autonomous helicopter capable of traveling up to 60 mph, withstanding wind speeds of up to 30 mph, protecting 314 square miles, and containing a grass ignition up to 1/4 of an acre with its

compressed-air foam retardant system.

DISCUSSION:

The objective of the San Mateo Pilot is to demonstrate that the Rain System meets operational requirements for rapid ignition investigation and suppression. The pilot project will consist of three demonstrations, each exhibiting the difference in response time between a fire engine and the Rain MK2 responding to a warming-fire sized ignition (approximately 1.5 ft).

To manage risk, San Mateo County firefighters will be stationed next to each warming fire. The burn sites will be located in Tomkat Ranch and Pescadero Creek Park.

Each demonstration will start by San Mateo County Fire personnel establishing a warming fire. Both the Rain MK2 and fire engines will initiate their response once they obtain the fire ignition coordinates from algorithmic smoke detection operating on the ALERT wildfire network or from San Mateo County Public Safety Communications. As soon as the MK2 begins flight, real time situational awareness imagery and fire size data will be streamed to SMC Public Safety Communications and the SMC Fire Department.

Once arrived at the site of the ignition, the MK2 aircraft utilizes onboard thermal computer vision to precisely deploy fire retardant to suppress the ignition. Once the ignition is contained, the MK2 autonomously returns to the take off and landing site.

The Windward Fund anticipates grant funding to become available for the San Mateo County UAS Fire Pilot Project in the near future. The grant will be a 100% funded grant with no-cost matching requirement from the County. If the County is successful in attaining the Windward Fund grant for the UAS Fire Pilot Project a set of deliverables, risk mitigation measure, FAA compliance requirements will be included in a formal contract with Rain Industries.

Department heads are seeking approval from the Board to proceed with the application process for the Rain Industries pilot project in San Mateo County.

FISCAL IMPACT:

None