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# MENLO PARK FIRE PROTECTION DISTRICT

## STAFF REPORT

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**To:** Board of Directors  
**From:** Harold Schapelhouman, Fire Chief

**Meeting Date:** July 19, 2016

**Item:** “RISE OF THE MACHINES” - FORMAL ESTABLISHMENT OF THE UNMANNED AERIAL VEHICLES (UAS) OR “DRONES”, ROBOTICS AND VIRTUAL REALITY (VR) “CONCEPTUAL PROJECTS” TO A NEXT GENERATION PROGRAM NEEDED FOR THE MENLO PARK FIRE PROTECTION DISTRICT AND THE NATIONAL URBAN SEARCH AND RESCUE TASK FORCE (CA-TF3)

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**Staff Recommendation:**

1. That the Fire Board accepts the report as presented.
2. That the Fire Board be given an update on the UAS/Drones/Robotics/Virtual Reality

**Timeline:**

2012 – 2014 – Various negative news stories come out about the San Jose Police Department and Alameda County Sheriff’s Department purchase and proposed purchase of Drones. The ACLU becomes involved and SJPD abandons its efforts and eventually ALCO SO is successful.

August 2014 – First use of a UAS/Drone at a house fire located at 29 Shearer Avenue in Atherton by Brandon Vaccaro Studio

October 21, 2014 – The Fire Chief seeks public comment from the Fire Board and community regarding the use of “an Aerial Drone Quad Copter”.

November 18, 2014 – The Fire Board is presented with an update on the implementation plan for Unmanned Aircraft System (UAS) which consisted of obtaining an FAA COA, acquiring a (UAS), insurance, ground school, training, medical exams, developing operational and safety procedures

November 28, 2014 – DJI, a drone manufacturer, representative Michael Shabun reaches out to Fire Chief Schapelhouman based upon news reports on Menlo’s new program

December 2014 – DJI sends a demonstrator Phantom 2 Vision UAS/Drone for testing and connects us with Matt Sloane of Atlanta Drone Consultants who has written a white paper on Drones and Public Safety

January 20, 2015 – The Fire Board is presented with “draft” UAS Policies

July 28 – 30, 2015 – NASA Ames UAV Show and Convention. This event was attended by several of members, specifically Battalion Chief Tom Calvert. A Town Hall style panel on UTM’s was hosted by Dr. Parimal Kopardeker, NASA Safe Autonomous System Operations Project Manager which featured Tom Baker DOD Director UAS Airspace Integration Joint Test, Michael Drobac, Small UAV Coalition Executive Director UAS National and Global Level, Dr. Dipayan Ghosh, Office of Science and Technology, The White House

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Technology Policy Advisor, Carl Guardino, Silicon Valley Leadership Group President and CEO, Marilyn Rudzinsky, Department of Homeland Security Program Manager Science and Technology Directorate, Shawn Bullard, Duetto Group President, Prof. Raja Sengupta, UC Berkeley, Rod Sinks, Mayor of Cupertino and Harold Schapelhouman, Fire Chief (First Responder use cases and concerns)

April 2015 – The Fire Board is provided with an updated presentation and demonstration on the UAS project

May 22, 2015 – Letter sent to the Menlo Park Recreation Department regarding Drone use at Bayfront Park and exemptions for public safety

February 10, 2016 – The Federal Aviation Administration (FAA) electronically received our completed on-line submittal request

March 28, 2016 – 12 Acre Grass Fire – Kavanaugh Tract Video – Authorized Drone overfly at command post for Brandon Vaccaro Studio – Cost \$300.00

May 18, 2016 – Fire District received its certificate of authorization (COA) to fly Unmanned Aerial Systems (UAS) in a blanket use, meaning anywhere, from the Federal Aviation Authority (FAA), in a class G airspace, or under 400 feet altitude and anywhere that is not restricted

June 21, 2016 – FAA releases “Small Drone use Rules”

July 19, 2016 – Fire Chief to layout next steps and multi-year plan

#### **Board Update:**

Since starting this “project” in October 2014, the Fire District has progressively and methodically worked towards obtaining its Certificate of Authorization (COA) from the Federal Aviation Administration (FAA), which it received on May 18, 2016.

The District would not have been successful in this endeavor had it not been for the dedication and hard work of retired and former Division Chief Frank Fraone, Battalion Chief Tom Calvert, UAV Program Coordinators Chris Dennebaum and Kevin White and our partners at the NASA Ames Research Center, Parimal Kopardekar, Manager, Safe Autonomous System Operations (SASO) Project, Captain Charles Drew, NASA UTM Mission Manager and Leonard Ligon, NASA UTM Public Safety Liaison who have helped us every step of the way.

Our attorney at Meyers Nave, Kris Kokotaylo, has expertly assisted us with legal interpretations from the FAA, formal comments on UAS Rules, our COA submittal and other matters like legislation associated with Drones.

Our partners at the Stanford Linear Accelerator (SLAC) Brian Sherin, Division Director and Chief Safety Officer, Ralph Kerwin, Fire Marshal and Lance Lougee, Assistant Fire Marshal and Emergency Management Coordinator for allowing us to use the facility to train our UAV pilots and collaborate on the up-coming robotics application for the Linac Beam Tunnel.

Our association with UAS manufacturer DJI who have provided us with demonstrator equipment, training and demonstrations of their new technology. Michael Shabun, Marketing Manager and Romeo Durscher, DJI Director of Education provided pilot training, demonstration of FLIR capabilities at live fire training and who has shared lessons learned internationally in integrating UAVs into the fire and rescue operations. We look forward to continued collaborations as we continue to explore where this technology is headed in the fire service.

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Jim Varner, Redwood City Fire Battalion Chief (retired) has provided a wide range of assistance, services, training and vision. He has captured footage of training evolutions, the 100<sup>th</sup> Anniversary Parade via his UAS. He has also provided pilot training, demonstrated various airframe's capabilities and collaborated with our personnel regarding integrating other emerging technologies into the fire service. His ongoing assistance is very much appreciated and valued.

### **Current Program:**

The Program Coordinators are currently updating the policies and procedures and working to identify and train four more firefighters and three IT personnel. We plan to purchase a new and updated DJI Drone with multiple and improved camera's with FLIR capability.

The Menlo Fire UAS/Drone is currently available for response on two of the three shifts, if requested by a Captain, or the Battalion Chief and can be "special called" by neighboring fire agencies or law enforcement. It still needs to be designated and have a unit designator through Fire Dispatch.

### **Where are we going?**

#### **1 – 12 months**

- Update the policies and procedures
- Train additional personnel
- Identify interested and appropriate personnel for the purposes of expanding into the Districts US&R Task Force 3 (FEMA/DHS Response Team)
- Have a UAV operator available on all three shifts and daily for emergency operations
- Obtain at least three aerial platforms and test smaller devices for in-door use
- Purchase a UAS/Drone response vehicle with enhanced communication and observation capability
- Reach out and work with local, regional and national developers, researchers and vendors to improve functionality for Fire and Emergency Services
- Formally request the FAA to expand the COA to include:
  - The ability to fly at night
  - The ability to fly over crowds
  - The ability to fly beyond line of sight and remote
  - The ability to fly in-doors
- Work with local airports on operational protocols, notification and FAA on Temporary Flight Restrictions (TFR)
- Work with SLAC on a robotics capability for the Linac Beam Tunnel for observation and "first strike" firefighting capability
- Work with Orator Plus/Facebook on Virtual Reality (VR) applications for training, real world simulation and situational awareness with 360 degree capability
- Coordinate with local Law Enforcement on program protocols and capabilities

#### **13 – 24 months**

- Auto deployment capability of UAS/Drones from Fire Command Vehicles and/or Fire Apparatus via a tethered or autonomous 'home base' application for heads up visual and situational aerial awareness that immediately allows commanders to look down on emergency incidents gaining a third dimension view
- Explore various payload options for UAS/Drone Fire and Emergency Services application's and provide testing of reasonable applications
- Research and develop appropriate Response Profiles for Computer Aided Dispatch (CAD) and corresponding Emergency Response Blocks for UAS/Drone deployment in the Fire District to integrate into daily operations

**25 – 36 months**

- Build an “Aerial Port” at Fire Station 77 for multi UAS/Drone platforms, 24/7 operations, using the rail line and major roadways as response routes for daily use and integration of appropriate emergency platforms into appropriate response profiles below the Highway 101 corridor.

**Summary:**

The UAS/Drone Team will continue to provide updates to the Chief who will keep the Fire Board and community abreast of their progress.