M E M O R A N D U M

TO: Mayor and Council

FROM: Richard Davis, Assistant Chief

DATE: April 16, 2015

SUBJECT: Robotics Emergency Deployment (RED) Team

The purpose of this memo is to provide information regarding Austin Fire Department's (AFD) investigation into the use of unmanned aerial vehicles (UAV) and robotics during emergency response, describe the purpose of AFD's Robotics Emergency Deployment (RED) team, and offer details for an upcoming media event that will highlight the capabilities of ground robotics in simulated emergency response scenarios.

Previous Council Action

On August 7, 2014, Austin City council approved item 29 on the council agenda authorizing negotiation and execution of an interlocal agreement between the City and Texas A & M University to investigate utilizing UAVs and other robotics during emergency response. The City Council authorized the AFD to collaborate with Texas A&M for a 4-year-study on the practicality of using UAVs.

This agreement has instituted a framework of cooperation that allows AFD to investigate the practicality of utilizing UAV and other robotics during emergency response. Both parties are providing mutual support and assistance in evaluating the benefits of UAVs. These applications are generating opportunities for enhancing multi-agency coordination. Additionally, other agencies have contacted the AFD RED team for future collaborations:

- University of Texas at Austin
- University of North Texas
- Worcester Poly Technical Institute
- National Institute of Standards and Technology
- Fire Research Grant Foundation
- RP Flight Systems

Background

The vision of the Austin Fire Department is to enhance firefighter safety and improve emergency response through the assessment and implementation of emerging technologies, such as robotics. Such tools can help facilitate increased situational awareness and incident command decisions at emergency scenes.

Safety is our priority and robotics may be used to keep our firefighters from excessive danger while gathering important information about the emergency scene. We are learning about potential hazards through robots equipped with Thermal Imaging Cameras (TICs), air monitoring sensors, and/or mounted cameras. Possible scenarios that may benefit from robotics are:
- High-rise fires
- Search and Rescue
- Hazardous Materials mitigation
- Flood events
- Wildfires
- Commercial and residential fires
- Post-fire investigations
- Pre-fire planning
- Scene mapping

The advantage of UAVs during a disaster allows for immediate feedback. UAVs are expected to enhance the way emergency response teams operate during disastrous situations. Emerging technologies, including the use of robotics and UAVs have been demonstrated in other municipalities, states, and countries, of assisting the fire service in emergencies. AFD has been given the opportunity to study and evaluate robotics technology in four phases:

- Education, certification and training which includes the establishment of policies and procedures (1st year)
- Evaluation of the various hardware and software platforms available within the industry (2nd year)
- The purchase of robotic platforms in various formats for emergency response (3rd year)
- Continued testing and upgrades (4th year)

AFD is continually expanding its research and collaborations within the industry of robotics technology. We are in the process of finalizing some of our policies and procedures. In addition, we are exploring the prerequisites needed for obtaining the necessary credentials for certification under the rules and regulations established by the Federal Aviation Administration (FAA).

The RED team has eight team members who are dedicated towards further evaluating and refining the use of robotics in the fire service and other public safety related fields. The overall mission of the RED Team is to mitigate real-world problems through the deployment and use of air, ground, and maritime remotely operated rescue robotics. Collectively, this team is made up of individuals who have private pilot licenses, FAA knowledge exams, FAA ground school certifications and commercial flight instructors both in the fixed and rotary wing formats.

It is our intent to lead with the proper education, certification and training to ensure we are doing things right.

It is our commitment to follow the guidelines and legislation set forth in the Texas Privacy Act HB 912 Use of unmanned aircrafts. Furthermore, the RED team's education, certification and training requirements will comply with the Austin city ordinance Chapter 13-1 that governs the use of UAV within city limits.

On Friday April 17, 2015, the RED Team will conduct a media event at the Govalle Water Treatment Plant to demonstrate operating robotics in search and rescue scenarios (see attached).

Cc: Marc A. Ott, City Manager
        Rey Arellano, Assistant City Manager
        Ray Baray, Chief of Staff
        Rhoda Mae Kerr, Fire Chief

Attachment

RED Team **Media Event**

Date: April 17, 2015

Time: 0800 to 1100 hrs, media expected to arrive at 1000 hrs.

Location: Govalle Water Treatment Plant (911 Linger Lane)

Scenario: The team will be demonstrating their skills by operating robotics in search and rescue scenarios. They will utilize donated Micro Tactical Ground Robotics (MTGR) to locate manikins in tunnels and identify locations for rescue personnel. This training will allow first responders to highlight the benefits of employing robotics in emergency formats.

Equipment: Combating Terrorism Technical Support Office (CTTSO) donated the equipment being utilized at the media event. Their email address is http://www.cttso.gov/ . The CTTSO is a government agency that is involved with research and development and testing and evaluation. The CTTSO found out about the Austin Fire Department's RED Team program and determined that we were a very professional group that could benefit from the use of equipment for testing and evaluation while developing our RED Team program.

The Micro Tactical Ground Robot (see figure 1) is an advanced lightweight robotic system (15 lbs. platform, 25 lbs. with manipulator arm, Ruggedized Operator Control Unit-7 (ROCU-7), and ancillary equipment), which is highly maneuverable on all terrains, capable of overcoming obstacles and climbing stairs. The system functions on a Windows 7 based operating system. It can be fully controlled and viewed from any Windows 7 based computer. The ROCU-7 provides the C2 input of the robot as well as providing the means of streaming real time video back to the operator and higher command levels.

Figure 1. The Micro Tactical Ground Robot