SFFD Drone Program Update:

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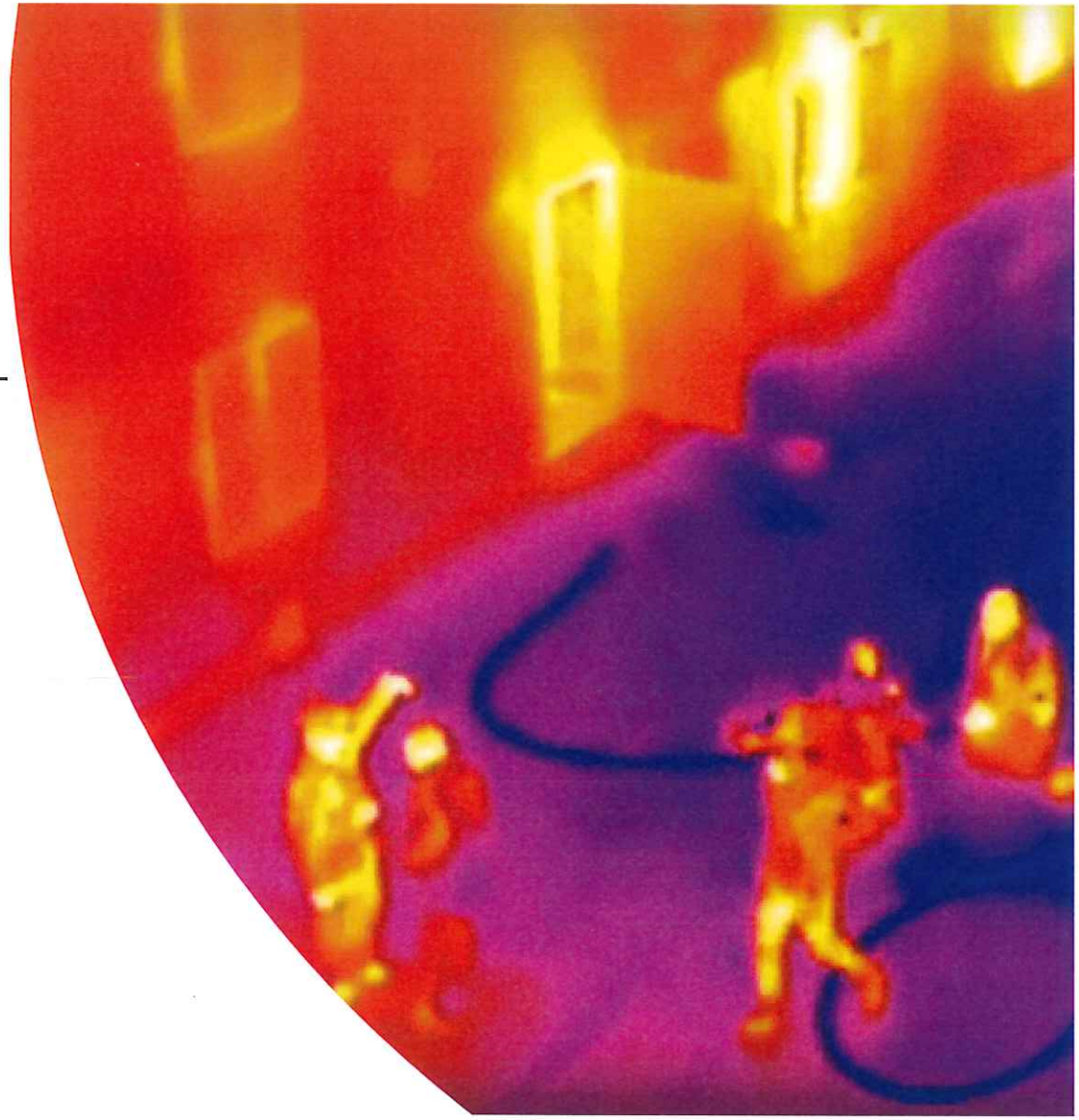
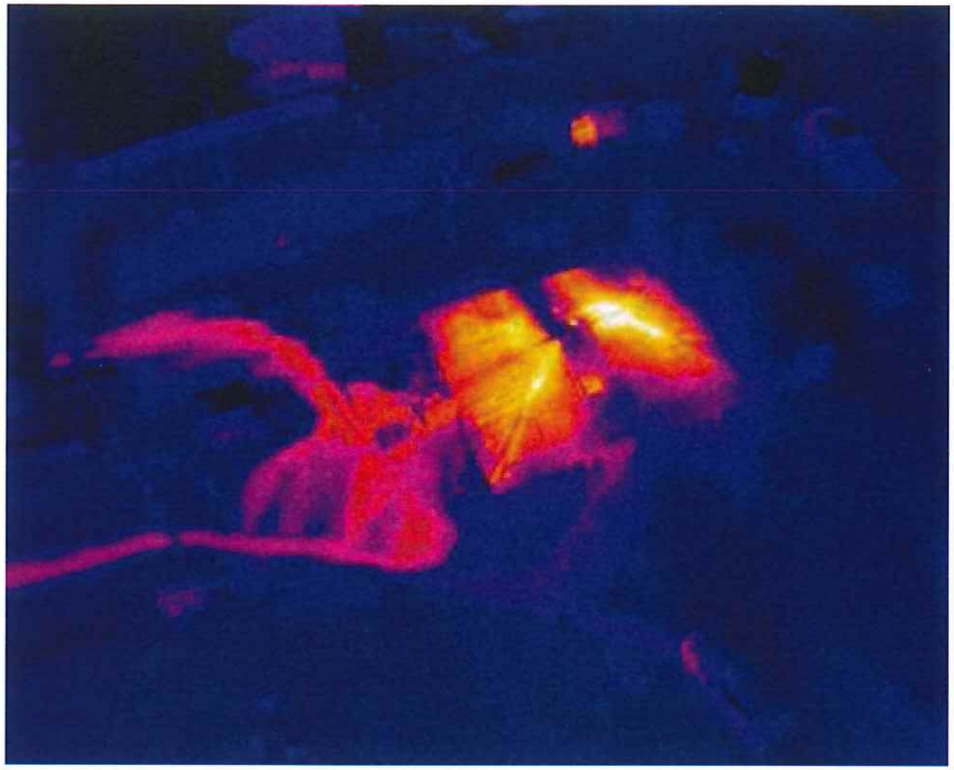


- Current State of CCSF Drone Policy:
  - COIT approved City Policy
  - 5 Depts. identified for Pilot Programs
  - Each Dept. to develop their own policy
    - Approval of Dept. Administration
    - Commission Approval
    - COIT Approval
  - Intend to engage
    - ACLU and Private Citizen Advocacy groups
  - FDNY - working for 3 years
    - just started flying 3 months ago.

SFFD Drone Program Update:

Drone Advisory Committee:

- Comprised of:
  - Mayor's Office Rep
  - City Administrator
  - COIT
- Will review and evaluate Dept. authorized use cases
- Provide recommendations to COIT on the continued use of drones



Policy Based on:

- Data Retention
- Privacy Concerns
  - Protecting Personal Identifiable Information
- Current Authorized Use Cases:
  - Emergency Response
  - Search and Rescue - Cliff, Surf, and Bay
  - Disaster Operations - Assessments
  - Training – Pilot and FD evolutions
- Safety

Public Aircraft Operations as a Govt. entity:

CIVIL Operator Rules: 14 CFR, Part 107

- FAA small Unmanned Aircraft Systems
  - Remote Pilot Certification
  - FAA Knowledge Test
  - UAS registration & operator certification

PUBLIC Operator Rules: 14 CFR, Part 91 w/ COA

- Apply for a Certificate of Authority (COA):
- Requires detailed Concept of Operations
- Allows the entity to self-certify

Urban Airspace (UAS) is the most complex:

- Vertical Hazards: Buildings, Trees,
- Muni & power lines (can not fly over Muni wires)
- Lots of WiFi – Radio Signals: Lost connection
- High winds (more battery use = less flight time)
- Privacy concerns
- High urban density of people (Liability to people and property)
- Beyond visual line of sight
- Airports and other aircraft: USCG & News helicopters

Training must include:

- Pilot Certification
- UAV Safety & Operations
- Airspace & Airport Rules
- Weather
- Aircrew resource management
- Aviation Radio Communications
- Mission Profiles & Parameters
- In-Flight Emergencies
  - Lost VLOS, Lost Link
- Flight Data Management & Reporting
- Policy issues & Data Retention
- Aircraft Maintenance

In the future: expansion of authorized uses

- Fire Investigation
- Accident Scene Investigation
- Pre-Fire Planning
- Safety Assessments
- As technology improves:
  - Enhanced situation awareness
  - Disaster surveys and applications

Types of UAS/UAV's

- Copter (free flight)
- Tethered Drone
- Fixed Wing
- Ground Robot
- Marine Vehicles

Marine Uses:

FDNY: Queens, 5th Alarm
Flight Time: 3 hours

Tethered Drone: FDNY

- Unlimited Flight Time
- No lost connections
- No Fly-Away's
- 200 ft. tether

Moving forward…Pilot Program Development

- Evolving Concept of Operations
- Additional Policy Development
- Budget Allocation
- Pilot Certification / Standards
- Liability
- Equipment selection
- Deployment models
- Develop Operational Procedures Manual
- Program Evaluation & Long Term Development

Summary:

- This is an Aviation Program and should be treated as such
- Implement with due diligence – appropriate time frame
- This technology WILL change the way FD's do business
- Must know where we want the program to go
- Constantly ensure compliance
- This technology is moving very fast
- Train, train and train

Shane Francisco

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Questions: