

Tully Hose Co. #1

Standard Operating Guidelines
THERMAL IMAGING CAMERA USE
Guideline # TF-310 – Rev.1

1. Purpose

- a. To establish a guideline to facilitate the most effective method for deploying the Thermal Imaging cameras in a way that provides the most protection for our personnel.
- b. To provide a reference document to be used for training of personnel in the uses, deployment, limitations, operation, care, and maintenance of the Thermal Image Cameras.

2. Policy

It shall be the policy of this department to utilize thermal image cameras in every structure fire and any other situations as identified where it will enhance the safety of fire department personnel and the rescue of all potential victims.

This policy outlines the various uses of a thermal imaging cameras, a guideline for its use and operation in firefighting situations, method of deployment, daily inspection and care and maintenance instructions.

3. Procedure

- a. The camera is carried on Engine 14. Personnel should become familiar with the location the camera.
- b. When the engine company arrives on the scene of a fire or any other incident where smoke will or could hamper visibility, the person riding in the officer position shall remove the camera from the charger and take it to the entry point of the structure. The attack crew of this apparatus will continue to be responsible for deploying the hand line.
- c. When operating in the “Search and Rescue Mode”, company personnel shall use the thermal imager camera to aid in the search for victims.
- d. If conditions warrant the use of a camera, the nozzle person shall be the operator of the camera unless an officer accompanies the crew then they will operate the camera in conjunction with the attack crew. The nozzle person should make periodic sweeps of the room and/or structure they are operating in while in the suppression mode. Command should be notified that the camera is in use. Search and rescue and suppression activities should occur in compliance with their respective SOG’s and standard firefighting practices should continue to be observed.
- e. Camera operators must be aware that they have a tendency to move faster than the rest of the team who are operating in zero visibility. The camera operator shall not advance too quickly, as to leave the rest of the team lost in a zero visibility environment.

- f. Firefighters should remember that they must stay low even if the camera allows them to see that the majority of the heat is at the ceiling. The possibility of a flashover in the dynamic atmosphere of a structure fire is higher than ever before because of new materials, construction methods and rapid responses. Personnel must understand that the camera could fail and an escape route must be easily located, either by following a hose line or locating a window or doorway. The thermal imager has the potential to inspire overconfidence because it allows firefighters to “see” in an environment that in reality has zero visibility. It is imperative that a firefighter remembers exactly that.
- g. If the camera is not to be used for a period of time shut it off. Keep track how much battery power is left.

4. Thermal Imaging Camera Uses

- a. Provides safer navigation in a space where there is zero visibility due to smoke.
- b. Allows personnel to “see” in a zero visibility environment, which is a very useful addition to traditional search techniques. The time necessary for completing a primary search can be cut by almost half by utilizing a Thermal Imaging Camera.
- c. Enables suppression crews to execute a faster, more efficient interior attack. The shortest route to the fire, holes in the floor and obstacles in the structure can be determined and located efficiently.
- d. Reduces fatigue of interior crews because efficiency in performing searches and suppression is increased.
- e. Allows Rapid Intervention Teams to quickly and efficiently locate downed firefighters.
- f. May be used to determine fluid level within a container, which may be useful during an incident involving a hazardous material.
- g. May be used as a search tool to locate lost persons in open wilderness areas.
- h. The Thermal Imaging Camera allows the officer in charge to accurately observe and assess the situation as it is occurring.

5. Background Information

- a. The Thermal Imaging camera allows a two dimensional view of a smoke filled environment. Depth perception is limited. Firefighters operating the camera should remain low to the ground, scanning the entire area before them. When scanning an area with the thermal imager begin at the ceiling and conclude at the floor area immediately in front of them moving the camera at a slow pace as to avoid blurring objects together. Walking with the thermal imager is discouraged as trip hazards may be overlooked.
- b. Thermal energy does not travel directly through the walls. A thermal imager does not allow an area to be viewed, which is behind a wall. If fire is present inside a wall, the

camera will only be able to “see” it if the fire has increased the temperature of the wall itself. Fire inside wooden clad walls will be picked up much faster than fire on the other side of a more significant barrier such as concrete. Normal overhaul procedures must be utilized in order to locate fire extension.

- c. A human being will not provide sufficient thermal energy to penetrate most standard construction materials or solid items such as furniture. Therefore, it is reinforced that while conducting a search, rescuers must look under and or around beds, sofas and other objects where victims may have hidden to escape fire.
- d. Water, plastic and glass are all effective barriers for the thermal imager and may cause a reflective image. The team operating the camera must remember that the image present on the thermal imagers’ screen could be a “mirror image” of themselves or fire behind them being reflected off of glass, plastic or water. To test suspicious images, the crew should wave their arms and determine whether they are seeing their own image.
- e. Also, firefighters and occupants, who are wet from hose line operations, could be masked from the camera’s view during a search because there is a momentary balance of thermal signatures.
- f. The Thermal Imaging Camera must be used with the understanding that it is only a mechanical device and it can fail. Firefighters must plan for this possibility by carrying flashlights, maintaining contact with the wall, a hose line, or other routine methods for remaining oriented to location and the position of exits in a zero visibility environment. Crews should continue to employ standard fire fighting practices.
- g. Battery life is not substantial. A spare battery is also located within the camera holder on Engine 14. If the battery power graph is below the halfway mark upon exiting a structure, the battery must be changed prior to being handed off to another crew for use.
- h. The image displayed by the thermal imaging camera may decrease in quality as soot builds up on the lens and screen while operating on the fire ground. A soft cotton cloth should be used to clean the lens and screen periodically while operating the camera.
- i. The Thermal Imaging Camera has not been determined to be intrinsically safe as an ignition source. This device is not to be used in a potentially explosive atmosphere.
- j. The camera can also serve as a tool for detecting heat during the overhaul phase of an incident. It must be remembered, however, that the thermal imager cannot penetrate most construction materials including drywall, plaster and lathe, concrete, glass or plastic. Also, the thermal imager cannot penetrate water. It is sometimes difficult to differentiate between what is heat or fire trapped in a wall and what is radiant heat.

6. Operation of the Camera

- a. The cameras are stored in the apparatus chargers on their specific apparatus. The cameras, including accessories must be completely dry before returning them to the charger or the case so moisture is not trapped inside.

- b. In order to deploy the camera, remove it from the charger and firmly grasp the pistol grip handle. The carabineer should be clipped to your coat in order to lessen the chance of the unit being dropped.
- c. To tun the unit on, push and hold the large GREEN button just below the screen for approximately one second. It will take approximately 15 seconds for the unit to warm up; self check and become operational.
- d. Once the camera is active, an image will be visible on the screen. Cool areas appear dark while heat sources appear white.
- e. On the RIGHT side of the display screen, a bar graph allows the operator to see the amount of energy reserve that remains in the units battery pack.
- f. If the battery power bar graph indicates that the battery has less than $\frac{1}{4}$ of its energy capacity remaining, it should be replaced with a fully charged battery. If the camera is deployed on an incident, the battery should always be replaced with a fully charged battery at the conclusion of the incident to insure that the camera is always in a constant state of readiness. The camera's battery is located in a compartment at the bottom of the handle. To remove the battery, flip up latch and open the hinged door. Ensure that the replacement battery is reinserted with the same orientation so that the battery's contact points coincide with those of the camera. Two batteries are supplied with the imager and are marked with the same number as that of the camera. These are the only batteries to be used in the thermal imager.

7. **Inspection**

- a. The cameras shall be checked as part of the routine equipment check of the apparatus to which it is assigned.
- b. The camera should be inspected for cleanliness. If any part of the camera is dirty a clean rag dampened with face piece cleaner should be used to clean the camera. Do not use window cleaner to clean the lens.
- c. The camera and its carrying strap must be thoroughly dry before being returned to the airtight case or vehicle charger.
- d. The camera should be turned on and checked for proper operation and then turned off.
- e. If the battery charge indicator displays more than one bar of discharge the spare battery should be placed in the unit and the discharged battery charged with the provided charging unit.
- f. The camera should be returned to its case and all latches secured.

- g. Problems with the unit should be reported to the I.C. so that they can be noted and repaired as soon as possible.

8. Maintenance

- a. Batteries should be rotated weekly and charge as necessary.
- b. Screws on the camera should be checked periodically for tightness.
- c. After the camera is used on an incident it should be thoroughly cleaned and dried before it is returned to the vehicle charger.

9. Safety

No operation as outlined in this SOG shall preclude any person from using good judgement with due regard for the safety of all personnel.