Big Tree Volunteer Fire Company, Inc.
Standard Operating Guideline

Thermal Imaging Camera

Revised May 22, 2002

Purpose:
The following guideline was designed to facilitate the most effective method of deploying the Thermal Imaging Camera (TIC) in a way that provides the most protection for fire company personnel. In addition, this guideline serves as a reference document to be used for training personnel in the uses, deployment, limitations, operation, and care and maintenance of the Thermal Imaging Camera.

Safety:
Use of a TIC during emergency operations will assist in locating victims and fire in a more expeditious manner. This will enhance the safety of personnel by limiting the time spent in the hazardous area searching for both victims and the seat of the fire. It must by remembered that the TIC is a tool to be utilized by firefighters and will be used to augment sound strategy, tactics and time tested interior structural firefighting and rescue procedures. Over reliance on the TIC with disregard for traditional means of maintaining orientation in a fire could result in firefighters loosing their bearings should the TIC fail inside the fire building.

Training:
All personnel expected to use the TIC must receive proper training on the use of the camera prior to using it at an emergency scene.

Thermal Imaging Camera Uses:
- Provides safer navigation in a space where there is diminished visibility due to smoke.
- Allows personnel to “see” in a diminished visibility environment, which is a very useful addition to traditional search and rescue techniques. Using a TIC can substantially reduce the time needed for completing a primary search.
- Enables suppression crews to execute a faster, more effective interior attack. The shortest route to the fire, holes in the floor and obstacles in the structure can be determined and located efficiently.
- Reduces fatigue of interior crews by making searches and suppression more efficient.
- Aids Rapid Intervention Teams in quickly locating downed firefighters.
- May be used to determine fluid levels within a container, which may be useful during a hazardous materials incident.
- May be used as a search tool to locate lost persons in open wilderness areas.

Background:

A TIC is a device that translates a thermal picture into an electrical signal and then a visual picture for the human eye. This is accomplished because it relies on the thermal energy emitted by all objects and not on reflected visible light. TICs provide vision capability with zero light present. Thermal imaging technology, in essence, allows firefighters to see through smoke and mist. Everything viewed through the TIC lens retains its shape. People look like people, and rooms look like rooms. The TIC provides the firefighter with a black and white television view through the smoke and darkness.

When viewing a room using the TIC, hot things appear white, hotter things appear brighter white, and colder items appear black or gray. The whiter the representation displayed, the more heat present in the object.

Limitations:

The TIC allows for 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 TIC, begin at the ceiling and conclude at the floor area immediately in front of you. Walking with the TIC is discouraged as trip hazards may be overlooked.

Thermal energy does not travel directly through walls. A TIC does not allow an area to be viewed that is behind a wall or other object. If fire is present inside of 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. Because the camera has a black and white display, it is sometimes difficult to differentiate between what is heat or fire trapped in a wall and what is radiant heat.

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 around beds, sofas, and other objects and in closets where victims may hide to escape a fire. 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.

The TIC 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, employing a tag line, or other routine methods for remaining oriented to location and the position of exits in a diminished visibility environment. Crews should continue to employ standard fire fighting practices.

The TIC has not been determined to be intrinsically safe as an ignition source. This device is not to be used in an explosive atmosphere.

All firefighters are to read, understand, and follow the operating and maintenance instructions supplied by the manufacturer.

Incident Operation of the TIC:

Personnel should become familiar with the location of the TIC on the apparatus. Currently, the TIC is stowed on Big Tree Engine 1 in the crew cab. The engine officer shall determine who on the crew will operate the TIC.

If conditions warrant the use of the camera, the TIC operator should be directly behind the nozzle operator or should lead a team where hose lines are not required to be deployed. The most efficient operation of the camera occurs when its operator's view is not obstructed by other firefighters. Camera operators must be aware that there is a tendency to move faster than the rest of the team who are operating in diminished visibility. A minimum of two person teams should be deployed at all times.

At least 1 spare battery pack should be carried in the pocket of the operator as a backup to the battery pack that is in use in the camera.

Using a TIC has a tendency to inspire overconfidence because it allows firefighters to see in an environment that in reality has zero visibility. Firefighters should remember that they must employ safe and time proven firefighting practices.

It is important for firefighters to allow sufficient time to exit a hazardous atmosphere when the battery status indicator shows that the battery power is getting low.

Inspection Procedures:

The TIC should be checked as part of the weekly vehicle and equipment check.

The camera should be inspected for cleanliness. If any part of the camera is dirty, it should be cleaned with a dampened rag using soapy water. No harsh detergents or solvents should be used.

The camera and its carrying strap should be dry before being returned to its case.

Batteries should be replaced in the camera with fresh batteries after each use at an incident or training.

Any problems with the camera should be reported to a chief officer and the problem noted and posted on the TIC. If necessary, the camera should be removed from service.