

April 2, 2001

Richard E. Hanson
3M Inc.
3M Center Bldg. 591-30-02
St. Paul, MN 55144-1000

Dear Mr. Hanson ,

On behalf of the Nevada Fire & Rescue Department I would like to thank you for this opportunity to apply for funds to protect firefighter and civilian life as well as property in Nevada Missouri.

We are not connected to the 3M foundation, but we are working to advance the same goals. Also, we do share in training exercises with the emergency response team at our local 3M plant here in Nevada. We have chosen to seek funds from your foundation because Nevada is home to approximately 700 employees of 3M and the equipment we hope to obtain could be beneficial to the 3M plant.

Our goal is to acquire a thermal imaging camera that would be of great value to the community. *Preserving Life with a Thermal Imaging Camera*. I am sure that after reading the attached proposal you will also see the advantage of this equipment and the wonderful affect that 3M could make on our community by providing the funds to make this project possible.

Thank you for your consideration. If you have any questions or concerns that I can help you with, please contact me.

Sincerely,

Shannon Marston
Administrative Assistant
Nevada Fire & Rescue

417/ 448-2720
shannonmarston@hotmail.com

Wm. A. Gillette
Fire Chief
Nevada Fire & Rescue

417/ 448-2720
nfd200@ipa.net

Preserving Life with a Thermal Imaging Camera

Nevada Fire & Rescue Department
120 S. Ash
Nevada, MO 64772

GRANT PROPOSAL

TO

3M Inc.
Richard E. Hanson, Vice President
3M Center Bldg. 591-30-02
St. Paul, MN 55144-1000

March 2001

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Executive Summary

Thermal Imaging Cameras are becoming standard equipment in the fire service. There are many uses including locating victims and fire fighters in a structure fire with greatly reduced time; locating the point of origin of the fire so that it can be suppressed quicker to reduce property damage; locating hot spots of fires during overhaul reducing chances of the embers erupting into an additional fire; locating and containing Haz-Mat products; aid in locating missing persons or person ejected from vehicle in an accident. These are just the basic uses of the camera. However, due to the advanced issues of the thermal imaging camera they are very expensive. This is making it hard for smaller departments to acquire the life saving equipment.

The community of Nevada Missouri has voiced their desire for a thermal imaging camera for our department by raising funds to help with the purchase. Our goal is to receive funding through your organization to make this project a success. A thermal imaging camera will be put on the first-out engine and put into service as soon as firefighters have been through the necessary training.

The beneficiaries of this project is the lives of the Nevada citizens and their property.

Introduction

Nevada is a rural town in Southwest Missouri with a population of 8,976. Nevada is the county seat of Vernon County. The town is located 90 miles south of Kansas City Missouri. The Kansas border is 10 miles to the west. We are mostly an agriculture community. Nevada is home to the largest producing 3M manufacturing plant and other large manufacturing factories. Residents appreciate the slower pace of life that the town provides.

The Nevada Fire Department was established in 1885. The transportation consisted of 2 work horses (Dan & Joe) and a wagon. The department has changed with the times and needs of the community. We are a combination department consisting of 1 Fire Chief, 12 career firefighters, 1 administrative assistant and 15 volunteer firefighters. Currently there is one station that protects the entire city and a small part of the county. Our coverage area is roughly 36 square miles and a population of 12,000.

Nevada Firefighters are highly trained and educated with fire fighting & rescue techniques. Every career firefighter is EMT licensed and firefighter I & II certified. We believe training to be the #1 key to saving life and property. Therefore, we always have everyone involved in training in a wide variety of subjects.

Nevada firefighters are well respected in our community. In the past 7 years 10 firefighters have received awards from the community for their "Heroic Lifesaving Efforts". We are proud to say that in the year 2000 we had zero (0) civilian deaths or injuries. Property involved in incidents for the year of 2000 had an average of 5% damage. We are highly involved in promoting fire safety at our local elementary schools as well as the entire community. Nevada Fire & Rescue provides fire safety classes at the local schools as well as fire safety and fire extinguisher classes to the community and business organizations at no charge.

We are equipped with basic fire fighting equipment. However with a small budget there isn't much room for updating and keeping with the times. The budget allows for servicing and maintaining the present equipment. Fire fighter and civilian safety being our first concern there is much needed equipment that there aren't funds for. We are turning to the community and local businesses and organizations to help with the funding of a thermal imaging camera. The camera has been justified a fire fighting necessity over

the last 5 years. It has been said that in the next few years the thermal imaging camera will be as highly regarded as fire fighting equipment as the SCBA's that are used for breathing. However, the cameras are very expensive so it is going to be hard for smaller departments to acquire them. The Nevada community has shown that they want and need this equipment in our department by raising \$2,000 through fund-raisers. They have brought this money to us to be designated to a Thermal Imaging Camera. It is now our duty to find the additional funds to acquire the life saving device.

Facts about Thermal Imagers -

Wherever there's fire, there's smoke. Smoke is the killer in most fires. And, firefighters battling to save lives and property are generally left groping in the dark. Fire can start in an instant and consume everything in its path. It's not just the flames and the blistering heat that makes fire so deadly. Smoke, choking, thick and black, can make rescue all but impossible. The minute you step inside the door, your vision is gone. In the darkness speed is crucial for firefighters. If you have people trapped inside, you don't have a matter of minutes to get them out. It's literally seconds. If the heat doesn't get to them, the smoke will.

A recent episode of Dateline NBC on May 8, 2000, showed the country how greatly needed Thermal Imaging Cameras are in every Fire Department in America. They speak of a fatal fire that took the lives of three little girls.

Firefighter, "I remember a helpless feeling crawling around in there. And it could only probably have been just a matter of a minute or so, but, knowing that we had children in this house and we couldn't find them." Mother, "They came out with one of my daughters and left with her in an ambulance. And they didn't - they didn't come out with the other two until it was all over when they brought them out in bags."

Two of the mother's children were dead. And, Patty, the one rushed to the hospital, would die of her injuries days later. Only after the fire was over did the mother discover just how close the firefighters had come to saving them.

Firefighter, "When we crawled through the door, we crawled across, I believe, the little girl was about 18 months old. She was on the floor, and we crawled right across the top of her."

Despite equipment that's allowed firefighters to get farther and farther into burning buildings, the major problem is that working in smoke, they are essentially blind. With a thermal imaging camera, on a search and rescue mission, even in the thickest, blackest smoke, a firefighter is able to see. Firefighter, "Certainly, if I'd had this piece of equipment on, I would have seen her as soon as I cleared that room."

This terrible story is one that we hope our community never has to experience. To know that there could have been a piece of equipment that could have saved a child's life, but we just couldn't afford it. Our community, which you and I and your employees live in, has a great potential of this type of disaster. The Nevada Fire & Rescue Department

does not have a Thermal Imaging Camera. That is why we are asking you to help us collect the funds to buy this life saving device.

In the February 1999 issue of Fire-Rescue Magazine, Editor Larry Stevens summarized the results of a nation-wide study of the effectiveness of thermal imaging cameras. Firefighters in test burns around the country represented a cross-section of America and included seasoned veterans from Seattle, Chicago and Boston.

Without Cameras:

- 60 percent of the time, firefighters were able to rapidly locate the victim.
- Over 30 percent of the time, firefighters couldn't find their way out of the burning house.

With Cameras:

- 99 percent of the time, firefighters were able to locate the victim.
- 100 percent of the time, firefighters found their way out of the burning house.
- The time required to satisfactorily complete a search, dropped by 75 percent.

These statistics demonstrate the usefulness of this technology in the fire industry for both locating victims and guiding firefighters through burning structures.

Thermal Imagers can also be used for finding "Hot Spots" in structure fires. Using the thermal imaging camera saves time and property damage from having to chop up walls during chimney fires. Thermal Imaging finds hot spots and smoldering fires behind doors, in ducts or behind walls. Ceilings or floors weakened by fire damage that could collapse also can be detected by the thermal imager. By looking through the screen you can see where a roof is the hottest and be able to cut a ventilation hole at the precise spot. Saving thousands of dollars in property damage.

Haz-Mat materials is another area thermal imagers can be used. Haz-Mat movement can be detected along with levels of a product. Thermal Imagers will identify materials on the surface of water when the material has a different temperature than the water. It will identify gaseous clouds and solids or liquids on the ground when there is a temperature difference.

Thermal Imagers are sensitive enough to help in manhunts and lost persons. They can detect the heat off of the person or their feet or handprints. If a person had ran across a field you would be able to see the feet print on the ground through the imager screen. If a child had fallen in a well you can aim the camera to the bottom of the well and be able to see the body.

History of Thermal Imaging

- Thermal imaging was first developed for U.S. military applications to enable soldiers to better visualize the battlefield.
- "America Burning Study" identified thermal imaging technology in 1972.
- Fire Service use began in Europe in the mid 80's.
- FDNY placed their first units in service in 1985, with other departments following in the mid 90's.
- Impact will be as significant as the SCBA or the Hydraulic Extrication Tool.

How Does Thermal Imaging Work?

Thermal Imagers detect thermal energy similar to the way your eye detects lights. All objects have a certain temperature and emit waves of thermal energy called infrared radiation. The hotter an object, the more energy waves are emitted.

Thermal Imagers cannot see through walls, glass or other solid objects, but they can detect as little as a .05 C difference in surface temperature. That difference helps to identify hidden fire.

Using this technology, firefighters can see heat signatures as small as that of footprints or handprints.

Summary of Usage

- **Size up** - Thermal Imagers allow firefighters to find the source of the fire quickly, helping them save lives and property damage.
- **Attack** - Thermal imagers help incident commanders intelligently allocate resources at a fire and to quickly get water on the fire, not just on the smoke. Proper use saves the lives of firefighters by warning them of potential ceiling collapses and other dangers.
- **Search and Rescue** - Firefighters used to crawl through burning buildings. Groping in blinding smoke for unconscious victims. With thermal imaging, it takes firefighters seconds to scan a room.
- **Overhaul** - After the fire has been put out, firefighters can scan the fireground in seconds to locate hot spots that might re-ignite. Using a thermal imager, overhaul can be done in 75% less time. This frees us firefighters to make other calls. This also prevents heat stress injuries.
- **Training** - Using transmitter systems, incident commanders can observe in real-time and videotape at the scene. Videotapes can be used for review and teaching later.
- **Haz-Mat** - Firefighters can identify sources of vapors and gases, and determine liquid levels in containers, helping to manage hazardous materials spills and other accidents more effectively.
- **Wildland Firefighting** - Using thermal imagers, firefighters can quickly scan large areas for hot spots, aiding them in getting the fire under control quickly.

Goal:

To have an advantage at saving lives and property with a thermal imaging camera.

Objectives:

- To purchase a thermal imaging camera.
- To train firefighters and key personnel the operation and maintenance of the camera.
- To train firefighters and key personnel with practicals such as live burn, rescue and Haz Mat detection.

Methodology

April 2, 2001 - Submit grants for consideration

April 3, 2001 - Contact selected thermal imaging camera vendors for on-site evaluation of demo units. A sixty-day period will be allowed for all vendors to be represented and selection of camera to be made.

June 1, 2001 - Start the process of purchasing thermal imaging camera with acquired grant money.

June 1, 2001 - Release press release to local newspapers and radio stations notifying community of acquired grant, 3M's donation and agenda.

June 4, 2001 - Outline the training course based on the camera purchased. Notify 3M Emergency Response Team and Nevada Police Department of training schedule.

July 2, 2001 - Start department wide thermal imaging training.

August 6, 2001 - Place the Thermal Imaging Camera on the first out Engine. Declare camera to be in service.

Summative Evaluation

- To evaluate the effectiveness of the thermal imaging camera we will evaluate our incident reports from the last 2 years and find an average for time locating point of origin, extinguishment of fires and overhaul.
- After the thermal imaging camera has been in service for one year we will again evaluate the incident reports. Looking at the incidents where the camera was used we will average the times of the incidents.
- The information gathered throughout the first year of service will be formatted into a report. The report will consist of amount of times the thermal imaging camera was used and for what type of incidents. Also included will be the time saved during fires and rescues compared to the previous two years before obtaining the camera. This report will be distributed to the funding sources, City Manager, City Council as well as the community.

Budget

The budget below shows dollars requested of the 3M foundation and the value of resources provided by Nevada Fire & Rescue and other sources.

Thermal Imaging Project

Item	3M Foundation 85%	Matching Funds 15%	Total
1 Thermal Imaging Camera	\$19,458	\$2562	\$21,500
Thermal Imaging Training For Firefighters & 3M Emergency Team		\$280	\$280
Administrative Costs		\$350	\$350
Supplies For Live Fire Training		\$150	\$150
Totals	\$19,458	\$3,342	\$22,280

Budget Detail

1. (1) Thermal Imaging Cameras

This includes the thermal imaging camera system, 2 rechargeable batteries, battery charger, shoulder and wrist strap, carrying case.

2. Thermal Imaging Training for Nevada Firefighters & 3M Emergency Response Team

The Nevada Fire & Rescue will provide the actual cost of firefighter man-hours needed, including overtime for the classroom and live fire training. We have trained before with the Emergency Response Team at our local 3M plant and would like them to be included in our training.

3. Administrative Costs

The Nevada Fire & Rescue Department will incur all administrative costs occurring during the length of this project.

4. Supplies For Live Fire Training

Supplies will include, but not be limited to, hay bales and lumber for prop development to simulate a degree of realism in live fire training in a safe training environment.

