



Responding to Terrorist Incidents in Your Community:

Flammable-Liquid Fire Fighting Techniques for

Municipal and Rural Firefighters

## Final Technical Report

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University of Nevada, Reno

Fire Science Academy

Denise Baclawski, Principle Investigator

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## Overview

The University of Nevada, Reno Fire Science Academy (FSA) applied for grant funding to develop and deliver programs for municipal, rural, and volunteer firefighters. The FSA specializes in preparing responders for a variety of emergency events, including flammable liquid fires resulting from accidents, intentional acts, or natural disasters. Live fire training on full scale burnable props is the hallmark of FSA training, allowing responders to practice critical skills in a realistic, yet safe environment. Unfortunately, flammable liquid live fire training is often not accessible to municipal, rural, or volunteer firefighters due to limited department training budgets, even though most department personnel will be exposed to flammable liquid fire incidents during the course of their careers.

In response to this training need, the FSA developed a course during the first year of the grant (Year One), *Responding to Terrorist Incidents in Your Community: Flammable-Liquid Fire Fighting Techniques for Municipal and Rural Firefighters*. During the three years of the grant, a total of 2,029 emergency responders received this training.

In Year Three, two new courses, a train-the-trainer for *Responding to Terrorist Incidents in Your Community* and *Management of Large-Scale Disasters for Public Officials* were developed and pilot tested during the *Real-World Disaster Management Conference* held at the FSA in June of 2007.

Two research projects were conducted during Years Two and Three. The first, conducted over a two year period, evaluated student surveys regarding the value of the flammable liquids training received. The second was a needs assessment conducted for rural Nevada. Both projects provided important feedback and a basis for curricula development and improvements.

In summary, grant funds were used in support of the following activities:

- *Responding to Terrorist Incidents in Your Community* program development and ongoing curricular improvements
- *Large Scale Disaster Management for Public Officials* program development
- *Responding to Terrorist Incidents in Your Community Train-the Trainer* program development
- Hosting of the *Real-World Disaster Management* Conference
- Equipment and Infrastructure Improvements
- Course Awareness Campaigns
- Training Scholarships
- Needs Assessment Project
- Course Assessment Project

## **Program Description**

### Course Modules

*Responding to Terrorist Incidents in Your Community: Flammable-Liquids Fire Fighting Techniques for Municipal, Rural and Volunteer Firefighters* was developed during Year One and further refined in Years Two and Three. It is 32 hours in length and includes several modules intended for delivery to groups of 60 to 70 participants. Throughout the week, instructors introduce topics in the classroom and then provide students with the unique opportunity to practice concepts during hands-on live fire exercises conducted on the FSA's full scale burnable prop field. Students are introduced to the social psychology of terrorism and provided with real life examples of what might be encountered during an actual response event. Critical incident stress management is reviewed and the concept of community

bereavement is discussed as it specifically relates to large scale disasters. Other subject areas include the role and importance of pre-planning and specific areas that need to be addressed in pre-planning for industrial incidents. The course explores characteristics and hazards of flammable and combustible liquids, familiarization with pipeline transfer stations and terminal facilities, fixed protection systems, and other items common to flammable liquid manufacturing or storage facilities. Personnel also receive awareness training in common modes of transport by truck and rail. An essential part of both the classroom and field activities involves large volume fire fighting foam operations. This is conducted using equipment and techniques that are available to most structural fire departments. In addition to foam operations, attendees participate on suppression teams and are trained in fighting pressurized flammable liquid fires, liquefied petroleum gas fires, and spill fires.

### Personnel

Several individual contributors from various departments within the University of Nevada, Reno provided subject matter expertise during development and in delivery of the modules.

#### *Principle Investigator:*

Denise Baclawski, M.B.A. – Executive Director of the Fire Science Academy. Ms.

Baclawski oversees strategic planning, fiscal, and business operations of the emergency response training program and 426-acre campus.

#### *Flammable-Liquids Course Development and Delivery:*

George Quick, M.P.A. – Assistant Director for Programs and Operations at the FSA,

Fire Officer IV, Airport Firefighter, and Fire Service Instructor II. Mr. Quick

oversees course content and instructional delivery of all programs at the FSA and was instrumental in the development of this grant funded course.

Edward B. Lawson, A.A.S. in Fire Command and Administration and Hazardous Materials Management – International Fire Service Accreditation Congress (IFSAC) Level 2 Instructor. In addition to instructing at the FSA, Mr. Lawson is an adjunct instructor for the National Fire Academy and the Office of Domestic Preparedness in weapons of mass destruction and nuclear and radiological specialty areas.

*Psychology of Terrorism Course Development and Delivery:*

Jim Richardson, PhD – Professor of Sociology and Judicial Studies; Director, Grant Sawyer Center for Justice Studies; and Director, Judicial Studies Program. Professor Richardson has a wide range of interests including religion and extremist violence.

Theodore Oleson, Jr., M.S. – Lecturer, Department of Economics and Doctoral Candidate in Social Psychology. Mr. Oleson has researched and written about terrorist organizations and their use of technology in planning and organization.

Markus Kimmelmeier, PhD – Assistant Professor of Sociology. Professor Kimmelmeier has written and researched topics related to group dynamics, interpersonal relations and political psychology.

Victoria Follette, PhD – Psychology Department Chair and Professor of Clinical Psychology. Professor Follette has researched and written on psychotherapy and the effect of trauma and post traumatic stress on individuals and organizations.

Colleen Murray, PhD – Director, Interdisciplinary PhD Programs in Social Psychology and Associate Professor of Human Development and Family Studies. Professor Murray has written and researched topics associated with family dynamics and grief.

Leonard Weinberg, PhD – Professor of Political Science. Professor Weinberg has written extensively about terrorism including the books *An Introduction to Political Terrorism* (New York: McGraw-Hill, 1989), *Global Terrorism: Beginner's Guide to Terrorism* (Oxford: OneWorld Publishers, 2005) and *What is Terrorism?* (New York: Chelsea House, 2006).

Maia Finholm, M.S. Thanatology - Doctoral Student in the Interdisciplinary Program in Social Psychology at the University of Nevada, Reno.

Adam Garcia, M.S. Criminal Justice, M.A. Political Science - Director, University of Nevada, Reno Police Services. Chief Garcia is the elected chair of the University and College Section of the International Association of Chiefs of Police and a recognized subject matter expert on weapons of mass destruction and terrorism.

#### *Large Scale Disaster Management Course Development*

Michael Southerly, M.A. - Program Development Specialist at the FSA. Mr. Southerly develops new curricula and revises existing programs for the FSA. He has more than 26 years of emergency services experience including municipal, rural, industrial and aircraft fire protection and has achieved the rank of chief.

#### *Course Evaluation and Needs Assessment Research Projects:*

Rebecca M. Thomas, M.A., PhD Candidate - Social Psychology Department. Ms. Thomas has published research in the area of law and social science.

Eric Herzik, PhD - Political Science Department Chair and Professor.

Professor Herzik has conducted projects on law enforcement practices (racial profiling, cooperative drug task forces), emergency management preparedness, and economic impacts (especially of the proposed nuclear waste repository) for state and local agencies throughout Nevada.

## **Equipment and Infrastructure Improvements**

### Equipment and Supplies

To provide municipal, rural, and volunteer firefighters with a realistic course, it is important to teach techniques using equipment commonly available to structural fire departments. In keeping with this goal, the following items were purchased with grant funds:

- Emergency One™ commercial pumper
- Large volume foam application system and accessories
- Air compressor
- Mobile breathing air station trailer
- Self contained breathing air fill station
- Storage cylinders for breathing air compressor
- Self contained breathing apparatus, bottles and wear parts
- Self contained breathing apparatus mask washer, dryer and storage racks
- Large diameter (5 ½ inch) hose, couplings, nozzles, monitors
- Elevated monitor
- Videos and manuals

## **Course Awareness Campaign**

An ongoing course awareness campaign was used to communicate to the target audience information about the course, course dates, and the application requirements. The intent was to reach as many municipal, rural, and volunteer departments as possible in each of the 50 states. Awareness campaign activities include printed advertisement, printed brochure, Web site information, and trade show attendance.



## **Selection Process**

The goal of the selection process was to allocate the available seats evenly and fairly among the nation's emergency responders. U.S. Fire Administration statistics were used to determine the number of career and volunteer fire departments by state. Based on those statistics, a percent of the total was applied to determine the number of seats to be awarded by state.

After determining seats available by state, the following criteria were applied to select individual participants:

- Availability of seats for the preferred class date
- Geographic distribution within the state
- Number of applications received from a department
- Member of an underrepresented group
- Order the application was received
- Applicant's position within the department
- Years of experience

Final numbers reflect adjustments made resulting from either an insufficient number of applications received from a geographic area or from accepted participants canceling just prior to the course start date.

## **Numbers Trained**

Grant funds were used to provide each participant with travel, lodging, food, tuition, and gear rental for the course. A total of 33 courses were delivered between July 2004 and June 2007 to a total of 2,029 emergency responders representing more than 1,300 different fire departments in 1,246 cities from 50 states and the District of Columbia.

## **Student Evaluation and Improvement Process**

Evaluation surveys are administered at the end of each course asking the students and instructors to rank and comment on various aspects of the program. Feedback and comments are used to make improvements to the course application process, travel arrangements, and to refine course content.

Several students wrote letters after attending the course to communicate their satisfaction with the course and to express their desire that it continue. Many also wrote to their respective congressman and senators encouraging them to support funding for this program.

## **Course Assessment Project**

A course assessment survey instrument was developed in Year Two. Students who attended *Responding to Terrorist Incidents in Your Community* during Year One were surveyed to determine their overall satisfaction with the course, general understanding of the course content, and preparedness and confidence in applying the knowledge learned.

This assessment was continued in Year Three and surveyed all of Year Two and Year Three participants. The results of this assessment study showed that “the training is viewed overall very positively and is meeting the goal of better preparing individual firefighters and contributing to the readiness of communities across the nation to deal with possible terrorist attacks” (Thomas, et. al. 2007, p.3).

## **Needs Assessment Project**

An emergency management capacity assessment was conducted for rural Nevada per the Year Two plan. The project included a two part research survey. Input was requested

from local government emergency management officials using a survey instrument. These responses were then compared to responses from a similar study performed in 1994. The most notable finding of the project is that “in most circumstances, there is little change in emergency capacity reported in 2006 from that reported in 1993-1994” (Herzik and Simon, 2006).

## **Other Course Development Projects**

### **Train-the-Trainer**

At the request of many graduates of the original program, a train-the-trainer course was developed for *Responding to Terrorist Incidents in Your Community*. The goal was to provide attendees of the original course the opportunity for advanced, in-depth training on the subject matter. The course prepares students as qualified trainers of the materials, allowing successful participants to train others in their respective departments. This method of training multiplies the value of grant dollars by increasing the reach of the original training.

The 40 contact hour course is broken into two segments. One segment is approximately 30 hours covering detailed course content. A written exam is administered as part of this segment. The other segment covers instructional delivery topics. During this segment, students are required to present a short module on one of the topics covered in the other segment. To be qualified as a trainer, each student must receive a passing score on both the module presentation and on the written exam.

### **Large Scale Disaster Management**

*Management of Large-Scale Disasters for Public Officials* is specifically designed to meet the needs of the emergency management professionals and public officials with emergency

management responsibilities. The original development plan projected a 24 hour course that was extended to 40 hours to provide a realistic timeframe for coverage of a large amount of information and to allow time to practice the concepts during advanced emergency operations center exercises.

The course and accompanying reference materials, combined with the intense emergency operations center exercises, will provide the participant with state-of-the-art training to assist in preparing for, responding to, recovering from, and mitigating situations in their community. The course is assembled to provide a “nuts and bolts” approach to managing the challenges of a large-scale disaster event, whether human or nature caused. Emphasis is placed on those preparatory actions required to develop a solid program upon which to draw appropriate resources to effectively and efficiently attend to community needs during a disastrous event.

The participant manuals for this course were developed utilizing a variety of sources, domestic and international, and attempts to provide information based upon the best practices in the field of emergency management. Additionally, the course meets selected objectives as defined by the National Fire Protection Association, Occupational Safety and Health Administration, National Incident Management System documents, as well as recommendations from the Federal Emergency Management Agency, The Department of Homeland Security, and many emergency management based organizations. The reference materials provided, beyond that which may be covered in the course, are to assist the participant in optimizing their community’s emergency management system and further develop skills in emergency management.

Topics covered include:

- Community Response to Managing Trauma in Times of Disaster
- Public Policy in Emergency Management
- Risk and Vulnerability Assessments

- All-Risk Approach to Emergency Management
- Weapons of Mass Destruction and Terrorism
- Identification and Use of Resources
- Incident management and Emergency Operations Center Organization
- Continuity of Operations
- Mass Care and Sheltering
- Debris Management
- Public and Individual Assistance
- Special Topics in Emergency Management
- Extensive EOC Operations using advanced simulations and technology

## **Conference**

The FSA hosted the *Real-World Disaster Management Conference* in June of 2007. A select group of 30 participants were given the opportunity to provide input to the two newly developed programs. Attendees were drawn from three different audiences including past *Responding to Terrorist Incidents in Your Community* students, FSA private organization clients, and emergency managers and other government representatives. Conference materials and activities were presented together with featured speakers that included terrorism experts. Attendees experienced portions of the two new courses and made recommendations for improvement.

## **Summary**

Over the course of the three year grant, the FSA achieved the goal of providing valuable training to prepare municipal, rural, and volunteer emergency responders for

flammable liquid fire disasters, especially those resulting from terrorist activities. A total of 2,029 students representing over 1,300 different departments in 1,246 cities from all 50 states and the District of Columbia have been served through Department of Energy funded scholarship training. In addition, equipment improvements were completed to better meet the needs of this target audience.

A research project provided valuable information for defining FSA program development and the fine tuning of the existing program. The research shows that the information and training received by the attendees of the program is viewed as valuable and is helping to prepare the nation to better respond to flammable liquid disasters, regardless of their cause.

Two new programs were developed. The first, at the request of graduates of *Responding to Terrorist Incidents in Your Community*, a train-the-trainer program to enable qualified attendees to share valuable program information with other members of their departments. The second program, *Management of Large-Scale Disasters for Public Officials* was developed to prepare emergency managers for the rigors of managing large disasters under a variety of scenarios. Both programs were pilot tested during the *Real-World Disaster Management Conference* presented at the FSA.

The FSA appreciates the opportunity to work with the Department of Energy in the development and delivery of this important, practical and timely training.