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From the Editor

## Quantity of Liquid Fuel Related to Burn Pattern

To help fire investigators determine fire origin and cause, the National Institute of Standards and Technology/Building and Fire Research Laboratory (NIST/BFRL) with funding from the National Institute of Justice (NIJ), has investigated burn patterns on flooring. For nonporous flooring the quantity of spilled gasoline can be related directly to the area of the burn pattern. For carpeted floors, the burning was more complicated. Significant quantities of the spilled gasoline remained in the areas where the carpet materials melted. The study also

produced measurements of heat release rate not found elsewhere that are useful to investigators in modeling fires.

A report on this study including the results from large-scale experiments may be downloaded from: <http://www.fire.nist.gov/bfrlpubs>. Go to the Title Index and click on "Flammable and Combustible Liquid Spill/Burn Patterns." Many photographs from the tests are included. Spill fire burn patterns in enclosures are currently being studied with joint support from NIJ and the U.S. Fire Administration.

For additional information contact Anthony Putorti at (301) 975-6172 or via e-mail: [anthony.putorti@nist.gov](mailto:anthony.putorti@nist.gov).



*Gasoline spill fire under the calorimetry hood in the large fire facility at NIST.*

## New Zealand Fire Service Funds Research Program

New annual funding for research was established by the New Zealand Fire Service Commission in 1998/1999. The fund's purpose is to encourage experts to apply knowledge gained elsewhere to particular fire service problems in New Zealand. Some thirty projects have been funded to date. They have covered the whole range of fire problems faced in the country, including environmental issues (such as like the toxicity of fire water runoff) to social issues (such as attitudes to fire).

Nineteen final research reports are posted on the website, [http://www.fire.org.nz/more\\_info/reports/fund/index\\_num.htm](http://www.fire.org.nz/more_info/reports/fund/index_num.htm), and are available in hard copy.

Experience with the program has shown that best results come from projects that have well designed and usable outcomes. It is

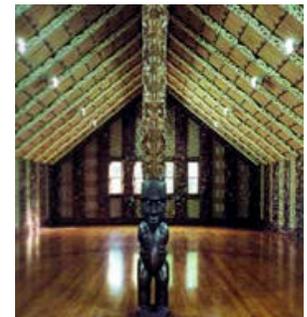
important when administering a fund of this kind that an expert group of fire service, engineers and academics is formed to carefully assess the research proposals. The group needs to look hard at the scope and method of proposals to make sure that each has a good chance of being achieved within time and budget.

As an example, a current research project looking at ways to decrease risk, death and injury from fire, while being sensitive to the heritage and cultural values of the Māori, New Zealand's indigenous people. Māori meeting houses, known as Marae, often are very old timber structures, beautifully decorated inside with fine wood carvings and intricate woven grass panels.

On certain festivals during the year, the whole building can be

used for large numbers of people to sleep. The challenge: to maintain the use of the buildings and their heritage while providing for fire safety.

For additional information contact Dr. Paula Beever, Principal Fire Engineer, at [paula.beever@fire.org.nz](mailto:paula.beever@fire.org.nz), (64)+ 4 496-3717, FAX (64)+ 4 472-9707



*Marae, a New Zealand Māori meeting house.*

## NIST Video Aids in Education About Flashover



Still photo from Christmas tree video (Download video segment in either format: [AVI](#) or [MOV](#))

People who know fire also know that fires depicted in movies and television for entertainment can leave the wrong impression about the speed at which fires grow and the amount of time available for escape.

This misinformation can cause people to underestimate the danger of fire and cause them to make bad decisions in the event of a fire. The Building and Fire Research Laboratory at NIST has taken video footage from actual large scale fire tests and assembled them into a 10-minute VHS video that clearly shows the growth of fires in furnished rooms from ignition to flashover.

In the first segment, the rapid ignition and burning of a dry Christmas tree in a corner brings a living room to flashover in 45 seconds. (This short and powerful segment also is available for viewing and downloading as a web

video using the link under the photo on the left.)

In the second segment, flaming ignition of an upholstered sofa in a living room results in flashover in 4 minutes. In the third segment, a small simulated wastebasket fire ignites an office workstation module and produces flashover in multiple modules in about 5 minutes.

Thousands of copies of the tape have been distributed to date by NIST and the U. S. Fire Administration. It is a great tool for fire department public information and safety programs. There is no copyright on the tape; requestors may make as many copies as needed. To receive a complimentary copy of the video in VHS or other formats, send an e-mail request to Mr. Nelson Bryner ([nelson.bryner@nist.gov](mailto:nelson.bryner@nist.gov)) or fax: 301-975-4052.



Still photo from living room video.



Still photo from office workstation video.

## U.S. Army Needs Input to the Design of Infrared Imagers for Fire Fighters

In the course of their duties, fire fighters and soldiers share many tasks in common. They both have to move and navigate; locate and evacuate casualties; survive a hostile environment; and make quality, informed decisions. The U.S. Army's Night Vision and Electronic Sensors Directorate (NVESD), at Fort Belvoir, VA, is examining the feasibility of developing for fire fighters and soldiers an inexpensive, small, uncooled thermal imager. The target price for the device is \$2,000. The imager would not have the high-resolution

performance of the very expensive devices currently used in military applications. However, the imager could work well enough for most fire fighter tasks and be sufficiently low in cost to make it available to any fire fighter.

The NVESD team is interested in input from the fire service; particularly in how fire fighters (many of whom already have experience with thermal imagers) would prefer the physical package to work. For example, useful data would be responses to

questions such as: Should the device be helmet mounted, handheld, or have both capabilities? Should it be part of situation awareness and communications system or should it be standalone? For more information about this activity or to provide your thoughts on helping the design evolve, please contact Mr. Randy Sullivan at [rsullivan@thewexfordgroup.com](mailto:rsullivan@thewexfordgroup.com), or phone 334.291.0981; or Mr. Hank Kinnison at [hkinnison@thewexfordgroup.com](mailto:hkinnison@thewexfordgroup.com), or phone 706.221.5897. Both are Contract employees of the NVESD.



U.S. Army Night Vision and Electronic Sensors Directorate

## Fire Safe Structures Tests for the UWI



*Sample of home deck construction burning after exposed to flames from an 80 kW gas burner at the Forest Products Laboratory.*

Urban-Wildland Interface (UWI) fires are a great concern in California and elsewhere. The resistance of decks, windows and outside surfaces to fire spread can make the difference between homes that survive and those that perish. Today, many different man-made and natural materials or combinations are being introduced for use in home construction. The behavior of these materials to fire exposures varies greatly.

Professor Frank Beall at the University of California Forest Products Laboratory in Richmond is addressing these issues by developing fire test protocols to evaluate the behavior of decking, windows, wall and roof assemblies using simulated wildland fire exposures.

With the exception of the roof tests, the exposure is flame contact, which is similar to that caused by fuels in proximity to structures. The protocol for decks uses a 610 millimeter square sample of deck materials exposed to an 80 kilowatt gas fire flame impinging on the underside. As in previous studies for the Federal Emergency Management Agency (FEMA) and the California Office of Emergency Services (OES), the emphasis is put on evaluation of the resistance to fire penetration of the structure, not simply ignition of materials. The testing protocols are being developed for use in performance building codes and standards for structures in the UWI.

To aid local officials and consumers, performance measurements for specific products and systems are posted at <http://www.ucfpl.ucop.edu/WDFireResearch.htm>. Background information for these studies including a history of wildfires and fire safety guidance is found at <http://www.ucfpl.ucop.edu/FMIZone.htm>.

For further information contact: Frank C. Beall, 510-215-4233, [frank.beall@ucop.edu](mailto:frank.beall@ucop.edu)

## European Partners Study Extinguishing Tank Fires



*A 140 m<sup>2</sup> (1500 ft<sup>2</sup>) full scale burn performed to validate the foam spread model under fire conditions.*

The suppression of large-scale tank fires is complex and offers unusual challenges to fire fighters, the petroleum industry and the environment. A consortium of European government and industry partners is addressing the problem of understanding the limitations of the extinguishing mechanisms and fire fighting foams for tank fires.

The consortium's FOAMSPEX project includes practical scale characterizations of foam jets, laboratory and small-scale characterization of properties of various foams, modeling of foam spread on the burning fuel surface to enable prediction of extinguishing in full scale applications. Nearing completion, FOAMSPEX will be summarized in a book and at a seminar on Sept. 20, 2001, in connection with the INTERFLAM '01 symposium in Edinburgh, Scotland.

For additional information view the summary at <http://www.sp.se/fire/eng/protection/foamspe.htm> or contact one of the following: Dr. Bror Persson at the SP National Testing and Research Institute, [bror.persson@sp.se](mailto:bror.persson@sp.se); Dr. Antonio Lancia at TRI – Tesca Ricerca e Innovazione srl, [antonio.lancia@mediacom.it](mailto:antonio.lancia@mediacom.it); Mr. Dave Mulligan at ANGUS FIRE Ltd., [dave.mulligan@angusuk.co.uk](mailto:dave.mulligan@angusuk.co.uk).

## Motorcycles Get You There Faster



*São Paulo, Brazil Fire Department motorcycles and equipment carried.*



*Training Exercise with "Quick Attackers" used by the Tokyo Fire Department.*

The time to respond to fire with traditional emergency vehicles is increased greatly by traffic-clogged streets in major cities. Minutes saved in response to fires or medical emergencies are critical. In some areas of São Paulo, Brazil, with a population of 10 million, response times for traditional emergency vehicles can be 12 to 15 minutes. Using a pair of motorcycles, the fire service in the same area reduces the response time to 5 minutes.

Of course, motorcycles are very limited in the amount of equipment they can carry. However, there is a great benefit to having trained fire fighters/EMS personnel on the scene as quickly as possible to extinguish fires using building extinguishers or hoses, or to size up the situation and provide guidance for the amount of additional resources needed.

The São Paulo Fire Department's 400 cc motorcycles have a compartment containing: basic EMS equipment, tools, signaling devices, and other accessories, such as handlights and elevator keys.

In Tokyo, similar fire fighting motorcycle units nicknamed "Quick Attackers" use two types of 200 cc motorcycles that respond to emergencies together as an off-road emergency unit. The type T is loaded with an impulse Portable fire extinguishing system. The type U is loaded with simple rescue equipment and fire extinguishers. They are designed to provide quick fire fighting, rescue, medical first aid treatment, and fact-finding at earthquake and other disaster scenes.

There are 20 Quick attackers in service that in one year responded to emergencies 506 times.

To address similar response needs in crowded areas, U.S. fire departments in Seattle, New York, Miami-Dade, Lansing, Mich., are using alternate vehicles (bicycles, ATV's, and electric carts) for EMS response.

For Additional information contact: Lt. Mauro Lopes dos Santos, Corpo de Bombeiros – São Paulo, Brazil (e-mail [mauro@polmil.sp.gov.br](mailto:mauro@polmil.sp.gov.br)). The web site for the São Paulo Fire Department is URL: <http://www.polmil.sp.gov.br/ccb>. Contact for the Tokyo Fire Department (TFD), International Affairs Office is by fax at (81)+ 3-3211-0693.

Please note since the majority of TFD's information and documents are written in Japanese, they may not be able to reply to inquiries in English. The web site for the TFD is URL: <http://www.tfd.metro.tokyo.jp>

## From the Editor

Welcome to new readers and everyone returning for this second issue. Since our first issue in the spring **FIRE.GOV** has attracted 700 readers. I appreciate all the favorable comments we have received from many readers.

Some have requested information on specific areas of interest, such as equipment.

The staff and I are doing what we can to find and report relevant research activities that match these special requests.

In this issue we have taken advantage of the electronic media and providing a video and many photographs that can be downloaded, viewed, and used in any of your own web sites.

Please let me know about activities that you think others need to know about. Enjoy this issue.

*Dave Evans – Editor*

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*Better Fire Fighting Through Research*

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