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## How Fast Can Fire Spread?

Deputy Fire Marshal Ray Scott of **Prince William County (Virginia) Department of Fire and Rescue** needed to understand if and how fast fire could spread from house to house in small lot, single-family dwelling communities. The 2003 edition of the **International Residential Code (IRC)** permits single-family houses to be erected with a separation of 6 feet between exteriors without restrictions on wall materials and openings. Knowing the practical limitations in present fire department response time, could adequate protection be assured? Searching the NIST fire research collection's web database, **FIREDOC** (<http://www.fris.nist.gov/>) Chief Scott found the published results of large-scale fire experiments and other technical data available from laboratories around the world that helped him understand the

potential impact of 6-foot building separation on fire spread. One important resource discovered was the 1999 Fire Engineering Research Report by James Clarke at the University of Canterbury, New Zealand, *A Review of the Building Separation Requirements of the New Zealand Building Code Acceptable Solutions*, in which building to building fire spread was analyzed to provide an engineering basis for performance code requirements. That report led to technical papers and videos of full-scale experiments conducted by the National Research Council in Canada in which flame from a room fire in a structure ignited a target wall 1.8 m away. In part based on the results of international research, Chief Scott has submitted an IRC

code change proposal that will be considered in September, 2003. Chief Scott would like to hear from fire departments that have encountered incidents of house-to-house fire spread in new communities.

Contact: Battalion Chief Ray Scott, (1) + 703-792-6487, [rscott@pwcgov.org](mailto:rscott@pwcgov.org)



Fire spread in the Belmont subdivision of Ashburn Virginia in 1994. (Photo courtesy of Melvin Byrne, Loudoun County Department of Fire and Rescue.)

## CD Captures *In Situ* Burning of Oil Spills Literature

*In situ* burning (ISB) is being used today as an oil spill response tool because of research, and technology development in the past 20 years. This two-volume CD brings together for the first time a substantial portion of the research, development, planning and implementation undertaken by hundreds of individuals and dozens of organizations.

and training in the use of *in situ* burning as a response tool. The collection contains an enormous amount of information in a convenient format to be used in the planning, response, or research environment. It contains more than 350 documents with over 13,000 pages and nearly one hour of video.

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*In Situ Burning of Oil Spills: Resource Collection*

## CD Captures *In Situ* Burning of Oil Spills Literature, cont.

The resource material is contained in two volumes. Volume 1 has material most often related to planning and preparedness, response, data, software, case studies and links. Volume 2 contains reference material from a variety of sources.

The material has been indexed by primary author, a single topic listing for each item, and all references for each author. The items overlap with the categories in Volume 1. The user should check both volumes for information on a particular topic.

The editor, William Walton of NIST, recommends the 13 minute video developed by the Alaska Department of Environmental Conservation and Alaska Clean Seas in Volume 1 under the Planning category if you are new to the topic of *in situ* burning.

A limited number of the CD sets are available from NIST. Contact William Walton directly by e-mail: [william.walton@nist.gov](mailto:william.walton@nist.gov) providing your name, complete mailing address (including the country), and e-mail address.

## New Compressed Air Foam System for Aircraft Hangars

The National Research Council Canada (NRCC) has developed and successfully tested a prototype compressed air foam (CAF) fire suppression system to provide fire safety protection to aircraft and aircraft hangars. Earlier research indicated that the fire suppression system must control 90% of the fire within the first 30 seconds and extinguish it within 60 seconds.

Fire tests of the prototype CAF protection system were carried out.

Three simulated aircraft hangar fire scenarios were used to provide technical data that the prototype CAF system (made up of overhead CAF nozzles and portable low-level nozzles) could provide the necessary fire protection in the aircraft hangar. The low-level nozzles were located near each aircraft to suppress any fire that could be concealed from the overhead nozzles.

The prototype system produces uniform foams with

expansion ratios ranging from 1:4 to 1:20. Special nozzle designs permit the smooth discharge of foam. To prevent foam breakdown, the CAF nozzles have no sharp bends and contain no impact points, that are normally present in sprinklers and in fixed aspirated nozzles.

The NRCC tested CAF system satisfies the 30 second control/60 second extinguishment requirement for Group II aircraft hangars

in National Fire Protection Association Standard 409.

The complete paper is available on the NRCC site: <http://irc.nrc-cnrc.gc.ca/fulltext/nrcc44514>.

For additional information contact Dr. Andrew K. Kim, telephone (1) + 613-993-9555, e-mail: [Andrew.Kim@nrc-cnrc.gc.ca](mailto:Andrew.Kim@nrc-cnrc.gc.ca) or George Crampton, telephone (1) + 613-256-4464, e-mail: [George.Crampton@nrc-cnrc.gc.ca](mailto:George.Crampton@nrc-cnrc.gc.ca).



2.4 m diameter gasoline fire with 7 m tall flame at the time of CAF activation.



Gasoline fire at 15 s after CAF activation (2.5 m flame height).



Gasoline fire at 30 s after CAF activation (fire controlled).



Gasoline fire at 45 s after CAF activation (fire extinguished).

## Daily Wildfire Information on the Web

Do you want to check on the wildland fires burning today in the United States? Then you should look at GeoMAC (Geospatial Multi-Agency Coordination Group) at, <http://www.geomac.gov>. It is an internet-based mapping tool originally designed for fire managers to get an overview of

current wildland fires and see details of those fires. Now, GeoMAC's information and capabilities are available to the public. Information about previous fires also is documented. The area covered is the contiguous 48 States and Alaska.

The fire perimeter data is updated daily based upon input from incident intelligence resources, GPS (Global Positioning System) data, infrared (IR) imagery from fixed wing aircraft and satellites. GeoMAC contains relational databases to display information on individual

fires such as the name of the fire, current acreage and other fire status information or the user can link to remote automated weather station data near the wildfire. Users can easily link from GeoMAC to incident web sites via the link to the National Fire News page.

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## Daily Wildfire Information on the Web, cont.

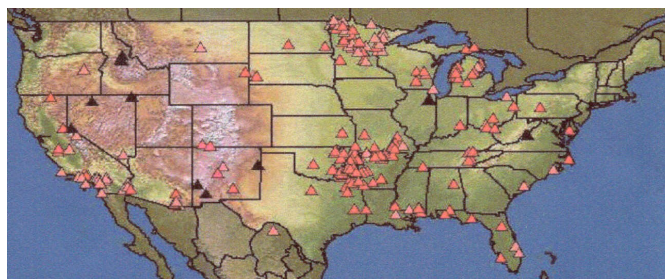
GeoMAC Team Members are: Bureau of Indian Affairs, Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, USDA Forest Service, U.S. Geological Survey, and the National Oceanic & Atmospheric Administration. Private Partners ESRI, ERDAS, Sun Microsystems, and IBM have provided hardware, software, and programming support. For additional information, please contact the National Interagency Fire Center at (1) + 208-387-5050 or via email, [geomac@usgs.gov](mailto:geomac@usgs.gov).

Australians have a similar web site available: <http://www.sentinel.csiro.au>. The Sentinel Fire Mapping is a mapping tool designed to provide timely fire location data to emergency service managers across Australia. Users also can identify fire locations that pose a potential risk to communities and properties. Sentinel Fire is the result of a collaboration among the Defence Imagery and Geospatial Organisation (DIGO), CSIRO Land and Water, and Australian Geosciences to design and

build a system that will help protect Australians during bushfires.

For additional information, contact Alex Held, telephone: (61) + 2-6246-5718,

fax: (61) + 2-6246-5800 or Dan Carmody, telephone: (61) + 2-6265-5812, fax: (61) + 2-6265-3041.



May 2003 GeoMAC display of previous 2003 wildland fires. Black triangles are lightning caused, red triangles are human and other causes.

## Fire Service Emergency Vehicle Safety Initiative

Too many firefighters are killed in vehicle accidents when responding to or returning from emergencies. In fact, it is the second leading cause of loss of life for firefighters. In an effort to reduce this statistic, the U. S. Fire Administration (USFA) has joined with the U.S. Department of Transportation, National Highway Traffic Safety Administration, Intelligent Transportation Systems Joint Program Office (DOT/NHTSA) to examine collisions involving

fire apparatus, personal vehicles, and falls from the apparatus that kill and injure firefighters.

As part of this new project a National Forum on Emergency Vehicle Safety (working with national level fire and emergency service associations and other organizations) will be conducted to develop draft “best practices” guidelines to mitigate these incidents. A series of tests of the “best practices to mitigate these

incidents” will be conducted in fire departments of various sizes and staffing components, and geographic regions.

Once consensus endorsement has been obtained for “best practices” the information will be distributed to local-level fire departments and other organizations. Hopefully use of the “best practices” will reduce firefighter life loss of emergency vehicle crashes.

For additional information on USFA’s Emergency Vehicle

Safety Research Projects and other resources go to the USFA web site at: <http://www.usfa.fema.gov/dh/tml/inside-usfa/research.cfm>



Tanker truck crash. (Photo used with permission from WrightwoodCalif.com)



### ... What is it Good For?

Lots of Americans are vacationing in CONUS. Are you a member of the ANG? What’s new at NIST? Do you have a JEEP? In government, fire service and other communications, acronyms are common abbreviations sprinkled though out the text. Where do you find the meaning of this jargon when your

dictionary fails? Look in FAAT. FAAT (*FEMA Acronyms Abbreviations & Terms*) is a compilation of fire and emergency terms, although it is not exhaustive. It does contain obsolete terms or organizations that may be found in the extant literature. An example of an obsolete entry would be: NCCEM National Coordinating

Council on Emergency Management (*obsolete; replaced by IACM*). If you want to view or download it, the site is: [www.fema.gov/doc/library/faatlist2002.doc](http://www.fema.gov/doc/library/faatlist2002.doc)

For a paper copy, contact FEMA Publications at 800-480-2520 (North America only).

FEMA looks forward to comments and recommendations; they are always welcome. E-mails may be sent to [FAAT@fema.gov](mailto:FAAT@fema.gov).

[CONUS: Continental (or contiguous) United States; ANG: Air National Guard; NIST: National Institute of Standards and Technology; JEEP: Joint Emergency Evacuation Plan]

## Inexpensive Residential Fire Sprinkler System Developed in New Zealand

To address the problem of residential fire deaths, the New Zealand Fire Service funded the Building Research Association of New Zealand (BRANZ) to develop a residential fire sprinkler system design that is inexpensive. The BRANZ report includes information about its effectiveness in reducing loss of life, injury and property damage due to fires in houses. The report is available for download at:

[http://www.fire.org.nz/more\\_info/reports/fund/reports/Report\\_1.htm](http://www.fire.org.nz/more_info/reports/fund/reports/Report_1.htm)

The proposed system achieves a 'cost per life saved' that is competitive with that of domestic smoke alarms.

The proposed combination plumbing-sprinkler system achieves a 'cost per life saved' that is competitive with hardwired domestic smoke alarms. The cost of installing the sprinklers in addition to the domestic plumbing into a simple single-level three bedroom new home in New Zealand is estimated to be approximately \$1500.00 NZ (\$825.00 US).

Following completion of research it was decided that, to assist and promote the incorporation of these systems, a guide to these systems was needed for plumbers and the wider building industry.

*Sprinklers for houses:  
Combination domestic plumbing*

and fire sprinkler system is an illustrated guide containing a step-by-step guide for designing a combination fire sprinkler system. Further information about the guide is available from BRANZ Publications Manager, Sandy Murray ([SandyMurray@branz.co.nz](mailto:SandyMurray@branz.co.nz)).

Another related report, *Cost-effective fire safety measures for residential buildings in New Zealand* by C. A. Wade and C. R. Duncan, BRANZ Study Report No. 93, details the smoke alarm cost-benefit study. For additional information on either BRANZ report, contact Colleen Wade, [ColleenWade@branz.co.nz](mailto:ColleenWade@branz.co.nz).



*The Robson family lost their mother and home in a fire. Here, BRANZ Engineer Nick Saunders, watched by Northland Fire Region Assistant Commander Mike Lister, explains the sprinkler system installed in the ceiling of their new home, built for them by Habitat for Humanity. (photo by Clive Crombie).*

## Beginning the Third Year

We want to thank all of the **FIRE.GOV** subscribers and visitors to our web site. This is the first issue of **FIRE.GOV**'s third year. In the past two years we have attracted over 1500 subscribers. After posting the previous issue over 9000 people visited the **FIRE.GOV** web site. Outside of North America we find that we are often read online from Australia, United

Kingdom, New Zealand and Japan. Some readers have passed along requests for news in specific areas of research. We welcome requests from readers as it tells us something about needs for research as seen by firefighters. Looking back over these requests in putting this anniversary issue together, it was clear that research concerning the effectiveness of

fire fighting foams was important to our audience. We have found some research in this area and reported it to you. We look forward to continuing the flow of information and we hope that this will stimulate interactions between the researchers and firefighters. We believe in **BETTER FIRE FIGHTING THROUGH RESEARCH**.



*Kellie Dave Ana*  
*Fire.Gov staff celebrate the beginning of the publication's 3<sup>rd</sup> year at a local restaurant.*

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