Numerous parameters such as the battery technology, its packaging, its design and its position within the vehicle, the fire scenario initiating event, etc. are liable to play a significant role on the overall behavior of an electric vehicle exposed to an external fire. Thus, these results cannot be extrapolated to other vehicles or other car companies or even to all potential fire scenarios. Based on this study, modeling work aiming to predict toxic gases dispersion and thermal effects in confined spaces (underground car parks, tunnels, etc.) will be conducted.

Towards the Understanding of Extreme Wildland Fire Behavior

by Martin E. Alexander, University of Alberta

The power of extreme wildfire behavior has been vividly demonstrated in recent years with events such as the Black Saturday fires of February 7, 2009 in south-eastern Australia that resulted in 173 civilian fatalities, or the wildfire that descended upon the town of Slave Lake in central Alberta, Canada, on May 15, 2011, destroying a third of the residential properties and businesses. The ever increasing number of wildland-urban interface fires in recent years has blurred the distinction between urban and wildland fire behavior to a large degree.

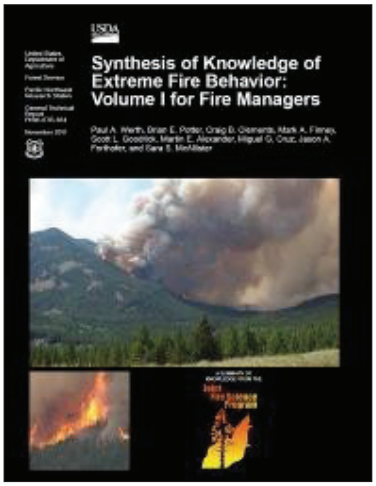
Extreme fire behavior represents a level of fire activity that generally precludes any direct suppression action by conventional means (e.g., ground forces with or without mechanized equipment). Extreme fire behavior can occur on both small and large fires, and usually involves several of the following characteristics: very fast spread, high fireline intensities, large flames, active crowning, prolific spotting, large fire whirls, and well-established convection column.

It's common for fires exhibiting such phenomena to behave in an apparently erratic and dangerous manner.

The sudden escalation leading to extreme fire behavior have been responsible for the deaths of numerous firefighters and members of the general public over the years. Some 425 wildland firefighters have, for example, perished as a direct result of burnovers or entrapments in the United States since the "big blowup" of 1910 in northern Idaho and western Montana. Safe and effective fire control management is dependent to a large extent on the ability to predict fire behavior. Predictability is indeed difficult when it comes to anticipating extreme fire behavior, but not necessarily impossible. For example, the spread rate and intensity of crown fires in conifer forests can be estimated with reasonable accuracy on the basis of forecast weather conditions using existing models, although admittedly projecting a final forward distance is challenging. And while the preferred locations for fire whirl formation can be approximately known, given their stochastic nature predicting whether they will occur or the timing of occurrence cannot be achieved with any degree of certainty.

A great deal has come to be learned about extreme wildland fire behavior over the past 100 years or so as a result of operational experiences and both basic and applied fire research. Decision support tools and guidelines have gradually been refined with time. Still, our understanding of the physical processes involved remains rudimentary.

The Joint Fire Science Program (JFSP)recently funded a team of scientists to undertake a current state-of-our-knowledge review and synthesis of the science on the topic focusing on what we know and what we don't know. The first installment of that effort has now been published:



Werth, P.A.; Potter, B.E.; Clements, C.B.; Finney, M.A.; Goodrick, S.L.; Alexander, M.E.; Cruz, M.G.; Forthofer, J.M.; McAllister, S.S. 2011. ***Synthesis of knowledge of extreme fire behavior: Volume 1 for fire managers***. USDA Forest Service. Pac. Northwest Res. Stn., Portland, OR. Gen. Tech. Rep. PNW-GTR-854. http://www.treesearch.fs.fed.us/pubs/39553

CONFERENCE REPORTS

Western States Combustion Institute, Riverside

The 2011 Fall Technical Meeting of the Western States Section of the Combustion Institute was held October 16 -18, 2011 at the University of California, Riverside. While most presentations at the conference focused on topics of combustion not related directly to fire science,

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Newsletter

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Fire whirl induced by multiple flames

The cover of this issue is illustrated with a photo taken by researchers from the University of Science and Technology of China showing a fire whirl induced by multiple flames during an experimental investigation of the dynamics of large fires in urban and forest scenarios. An array of 225 heptane pools were simultaneously ignited and a fire whirl spontaneously emerged, lasting for several seconds. The interaction of the multiple flames created an ambient eddy circulation necessary for onset of the whirl.
The image was submitted to the 2011 10th IAFSS Symposium Photo Competition by
Naian LIU, Linhe ZHANG, Zhihua DENG and Koyu SATOH from University of Science and Technology of China.

IAFSS was founded in 1988 with the primary objective of encouraging research into the science of preventing and mitigating the adverse effects of fires and of providing a forum for presenting the results of such research

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