

NewsLetter

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Joint Lab-EPA program

ASPECT team responds to recent incidents

by Todd Hanson

It's nine o'clock Tuesday morning, January 16, in Brooks, Kentucky, a small town roughly thirty miles south of Louisville. A CSX Transportation train derails on the tracks that run through town. Some of the train cars explode and as fire fills the sky with thick black smoke, nearby residents, some of them exposed to the chemical plume, report skin irritation, a strange taste in their mouths, and an unpleasant feeling in their lungs.

Authorities evacuate residents within a one-mile radius of the accident. Based on shipping manifests, authorities determine that cyclohexane, a flammable, inhalation hazard, was one of the primary chemicals feeding the blaze. When the Environmental Protection Agency is called to the scene, it requests the ASPECT (Airborne Spectral Photometric Environmental Collection Technology) aircraft, a small, twin-engine plane carrying Los Alamos-built sensors stationed in Texas. Meanwhile in Los Alamos, 1



Pictured above is the Brooks, Kentucky, train derailment as seen by ASPECT on January 16. ASPECT (Airborne Spectral Photometric Environmental Collection Technology) is a small, twin-engine plane carrying Los Alamos built sensors that can detect and locate chemical vapors. Photo courtesy of ASPECT/Environmental Protection Agency

Kroutil and Dolin are an integral part of a multi-agency team that responds to special chemical incidents, like the Brooks derailment, as well as to real or potential homeland security threats in support of the Department of Homeland Security's Rapidly Deployable Chemical Defense System. The RDCDS system combines aircraft and ground-based chemical sensors into a system that can provide advanced warnings to the public in the event of a chemical release. RDCDS uses the Environmental Protection Agency's ASPECT for its rapidly deployable airborne chemical detection capability. Los Alamos developed the plane's onboard sensor technologies and is currently helping with the analysis of data. Data collected by ASPECT from its analysis at an emergency response is transmitted to the EPA for a rapid overall assessment of

a situation and is then provided to local incident commanders. Kroutil and Dolin's work with the EPA and DHS is an example of just one of the many ways in which the Laboratory is working with government agencies.

The ASPECT plane, a twin-engine Aero Commander 680 aircraft based in the Dallas, Texas, vicinity, is equipped with a multi-spectral infrared mapping system and a Fourier Transform Infrared spectrometer package called ASPECT. This spectrometer detects and locates chemical vapors and can see through smoke and dust to get a measurement of the location and concentration of the vapor plume. A second sensor, a high-resolution Infrared Line Scanner, records an image of the ground below, as well as plume information. This sensor package is the only "stand-off infrared" detection tool in the nation devoted to emergency domestic response applications. The technology provides first responders with critical information regarding the size, shape, composition, and concentration of gas clouds. The system uses Global Positioning System mapping data and digital images of the site to create exact maps and digital data overlays of chemical plumes, as well as low-area locations where toxin-laden air may accumulate.

Since its initial deployment in 2001, ASPECT has responded more than 65 times to emergencies across the country. Earlier this month, ASPECT was deployed through the DHS RDCDS program with the EPA to a mysterious bird kill in downtown Austin, Texas, as well as to the recent Tournament of Roses Parade and the Rose Bowl football game in Pasadena, California, on New Year's Day.

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