



Engineering Sciences Section – 2005

C47 Performing 3-D Recreation as a Tool for Understanding Emergency Incidents

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The goal of this presentation using 3-D modeling is to illustrate what did, or did not occur during a chemical emergency incident.

This presentation will impact the forensic community and/or humanity by providing models, which are an invaluable tool for demonstration where a visual understanding of an event is important. Here is a tool that can illustrate, using the best data available, a video showing the most likely scenario. Anyone watching the video should be struck by the amount of realism it contains and the data that stands behind it.

This presentation is to show the value of using 3-Dimensional (3-D) video representations of a wide variety of events as a tool to illustrate what actually happened to interested parties. 3-D modeling has been shown to be helpful in re-creation of accidental chemical releases from rail, highway, and fixed manufacturing facilities. By interfacing with engineering analyses such as failure analysis and dispersion modeling, videos can illustrate how a mechanical failure helped cause an accident, or how a chemical release ultimately impacted (or *didn't* impact) people and the environment. 3-D models can be as detailed or as generalized as the situation requires – for example, a house fire or vehicle accident can be illustrated generically, or down to details including site aerial photographs and actual topography and meteorological conditions. These models are an invaluable tool for demonstration where a visual understanding of an event is important.

For most site recreations, it will be necessary to have an IT specialist actually visit the site. During this site visit, the IT Specialist will photograph, measure, and otherwise document all relevant aspects of the site to increase the realism of the model. Remember, the goal of this is to make the viewer of the recreation video actually feel that they are there. This adds to the effect of helping people believe that what they are seeing is actually what happened. The recreation will be generated using the best data available. This includes but is not limited to: Air dispersion models, depositions, aerial photographs, topography, and engineering failure analysis. Often, existing Computer Aided Design (CAD) models can be obtained and will speed up the generation of 3-D recreations.

There is practically no limit to the type and quantity of videos that can be generated once a 3-D model has been created. Unlike Hollywood, the number of cameras and lights are not going to increase the cost of the movie. Cameras can be placed in locations that litigants claim to have been during the incidents. Cameras can also move in the same paths as litigants say they moved in their depositions while the model moves in real time around them. People can be illustrated in the model with striking detail. They can walk, gesture, and do any number of movements. Or for cost reduction purposes people can be illustrated by a moving dot or a static human figure. Models can be detailed down to vehicles, telephone poles, building material, trees (yes, even species of trees), furniture, and weather conditions.

3-D, Chemical, Recreation