

Thermal Analyses of the Newhall Pass Tunnel Fire

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Abstract

An analysis was conducted to evaluate the fire that occurred in October 2007 just north of Los Angeles, California, in the Newhall Pass tunnel. The tunnel fire was a result of an accident involving 34 vehicles in and around the Newhall Pass tunnel. One of the vehicles caught on fire and began to ignite the other vehicles in the tunnel. The objective of the work was to determine the maximum exposure temperature in the tunnel and evaluate the conditions likely to be found in this fire. The study was conducted in two phases: (i) analyses of material recovered from the incinerated vehicles and (ii) simulation of the Newhall Pass tunnel fire using the Fire Dynamics Simulator. Based upon the metallurgical conditions of the materials recovered from the vehicles, bounding temperature values were determined at locations throughout the length of the tunnel. These were compared to the detailed numerical simulation, which modeled the layout and contents of the vehicles in the tunnel. Simulation results indicated that the peak gas temperature was 1,260 °C [2,300 °F] and occurred at the center and top of the tunnel. The material analysis indicated that the temperature at the center location was at least 880 °C [1,616 °F], which was determined based on a melted brass fitting. In addition to the vehicle located in the center of the tunnel, the material analysis results were compared to the model at five other tunnel locations. The temperature profile resulting from the simulation and material analysis will be discussed in the paper.

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