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PRACTICAL TEST OF EMERGENCY VENTILATION COMBINED WITH BUS FIRING AT THE KAN-ETSU TUNNEL

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SUMMARY

The Kan-etsu tunnel is the longest road tunnel in Japan, equipped with longitudinal ventilation system combined with electrostatic precipitators and vertical shafts. The emergency ventilation system for the tunnel had been studied, through numerical simulation, so that wind velocity in the tunnel would be damped quickly by means of jet fan control in case of fire. The full system proposed in the numerical simulation was installed and detailed tests were performed for the confirmation of the performance of the system before public service. In the test, jet fans or actual trucks were used to simulate the traffic influence. Also jet fans were used to substitute natural wind effect. By controlling the rest of the jet fans a quick reduction of the wind velocity was obtained which was qualitatively similar to the simulation results.

Along with some of the above mentioned tests, trays of gasoline or used busses were set on fire in order to observe the behavior of smoke carried by the controlled wind velocity. In the worst case, dense smoke reached 1000m from the fire point in 20 minutes, which is considered to be a satisfactory result to allow refuge action.

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