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Using computational fluid dynamics simulation to perform fire investigation
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Abstract
Fire occurred evening 10th July 1989 at Terwindle Rest Home - Auckland. Incident report shows that this fire resulted in seven fatalities and extensive fire damage to the building. The primary cause of the death was carbon monoxide poising from smoke inhalation. The fire started at the lounge which contained ten upholstered couches with polyurethane foam padding. Sprinkler fire protection system was not installed and the building has no smoke detection system (based on the New Zealand Building code requirement that was imposed at that time). In this study, the fire is modeled using Computational Fluid Dynamics (CFD) software FDS (Fire Dynamic Simulator). The heat release rate of the fuel burned was obtained from lab measurement of a sofa. The results were validated against the approximate time scale of the progress of the fire as it was found from the fire investigation report. It has been found that FDS can provide accurate simulation to the fire which can be used to perform fire investigation provided that the correct heat release rate of the fire used in the model. © (2013) Trans Tech Publications, Switzerland.

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