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Using STAR-CCM+ for Wind Dispersion Studies

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Various regulatory agencies such as the US EPA, OSHA, state and local code enforceme0nt agencies often require environmental impact studies when certain commercial buildings are renovated or newly constructed. Usually, these buildings are laboratories, special environments for chemical or biological agents or manufacturing plants that must discharge chemical effluents into the atmosphere. Other conditions also mandate studies of environmental influence such as large boiler exhaust, emergency power generation, or the effects of diesel trucks idling at critical areas around buildings.

The CAES Group of M/E Engineering regularly uses STAR-CCM+ to do a broad spectrum of wind dispersion models for clients who want or need to control airborne chemical contamination around their buildings. CFD is offered as a cost competitive alternative to wind tunnel studies and has many attributes not even available in wind tunnels. For instance, STAR-CCM+ can account for buoyant plumes, hot parking lots and roofs, the actual geometry of complex discharges such as induced flow exhaust stacks, and simultaneous transient changes in wind speed and direction.

This presentation will show select cases of how STAR-CCM+ was implemented in our regular work on hospitals, manufacturing buildings, academic institutions as well as special cases such as a helicopter landing on a roof.

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