



CHAM Limited Pioneering CFD Software for Education & Industry

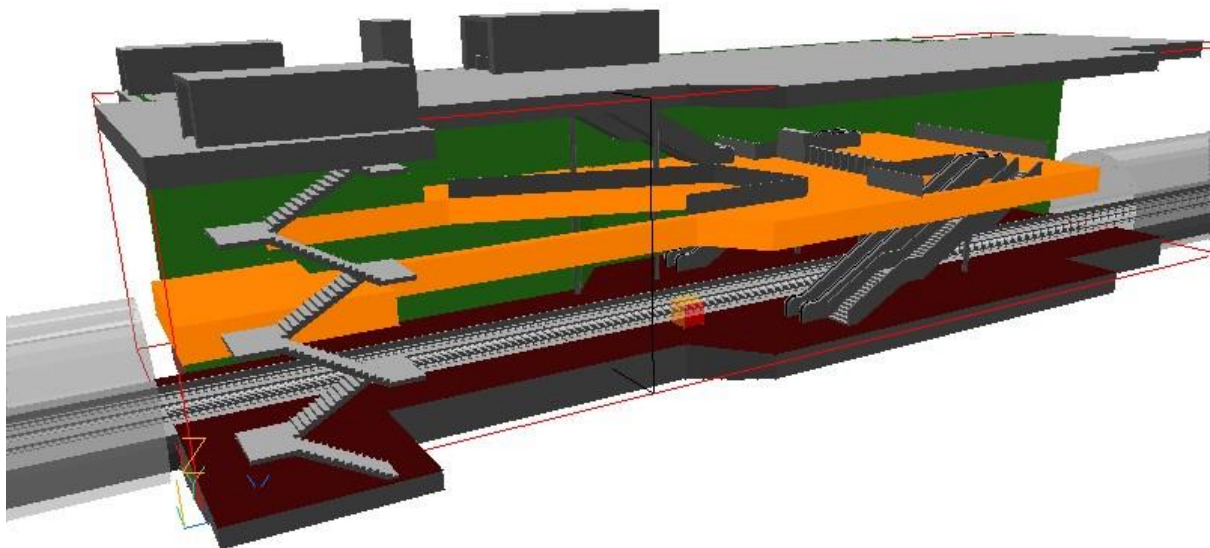
CHAM Case Study Fire in an Underground Railway Station

CHAM's agents for Portugal and Spain, Aertia Software of Barcelona, submitted a demonstration request on behalf of customers, GeoControl SpA, relating to fire studies in tunnel and adjacent underground structures.

In the following scenario, the intention is to simulate a fire on an incoming (moving) train as it exits a railway tunnel to a station platform. The conditions are as follows:

The train tunnel is at the bottom of the main domain containing the station and platform areas, with different stairs leading to main lobby upstairs and outside, as well as emergency stairs. The requirement was to simulate a fire in a train that is moving from the tunnel to the station where it stops.

- Fire power goes lineally from 2 MW to 30 MW in 15 minutes.
- The fire is at a $\frac{1}{4}$ of the train edge
- The tunnel of the train arriving to the station is an inlet of 80 m³/s. The opposite tunnel is an outlet with the same flow.
- The platform where the train stops has 3 or 4 outlets in each side, totalling 180 m³/s of flow



FLAIR

Station Demo



For the purposes of this demonstration, we have reduced the domain area (the red outline) just to incorporate the station section up to its roof. One stairwell seemed to be closed off and was therefore excluded. The outlets are at the top of the domain. A fire (box) has been placed on the platform edge fairly centrally. The boundary conditions and volume flow rates specified by the client in and out from the tunnel were used, using an arbitrary temperature of 20 degree C.

