Alan G. Davenport Wind Engineering Group, The Boundary Layer Wind Tunnel Laboratory

Internal Ventilation (HVAC) Studies For Complex Architectural Geometry

Summary

HVAC efficiency studies are carried out for geometrically complex halls (atriums). The results of the numerical simulations, in terms of temperature, velocity and air exchange fields, are used to modify the ventilation systems for the two atriums. Computational Fluid Dynamics (CFD) provides useful information to the mechanical engineers in order to assess and improve the HVAC design.

THE CONCERT HALL

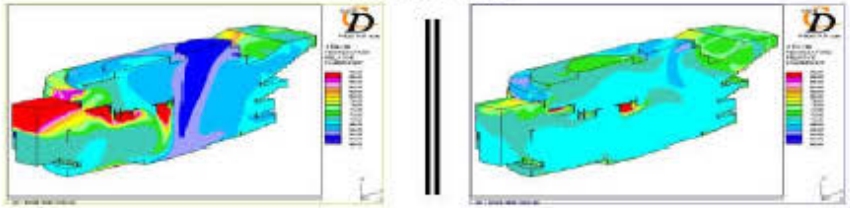
Geometry

Grid

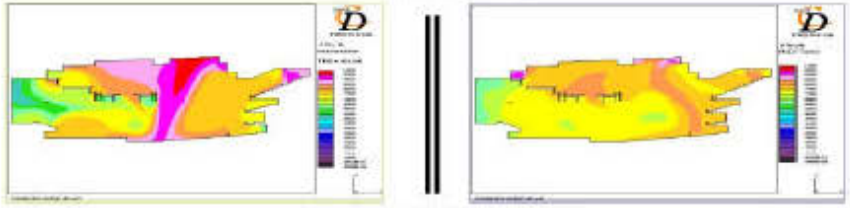
Preliminary HVAC System

Modified HVAC System

VELOCITY FIELD



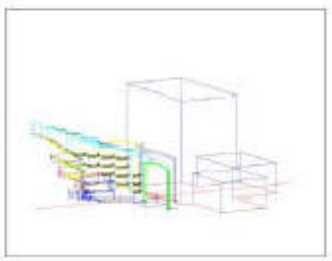
TEMPERATURE FIELD



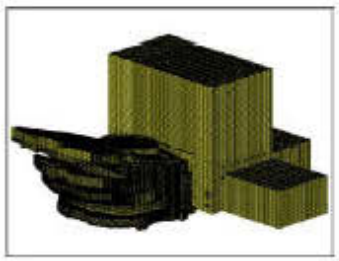
MIXTURE FRACTION FIELD

THE OPERA HOUSE

Geometry

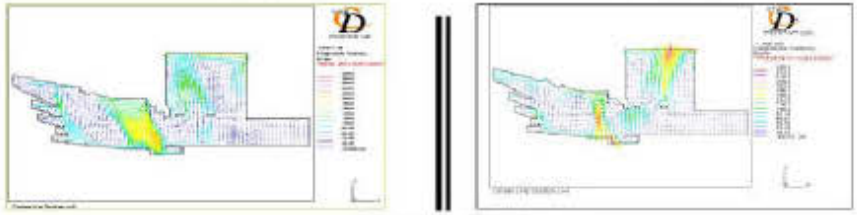


Grid

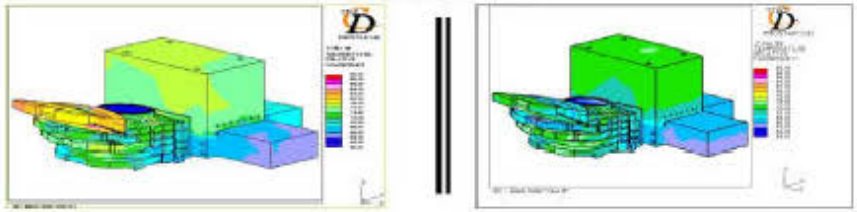


Preliminary HVAC System

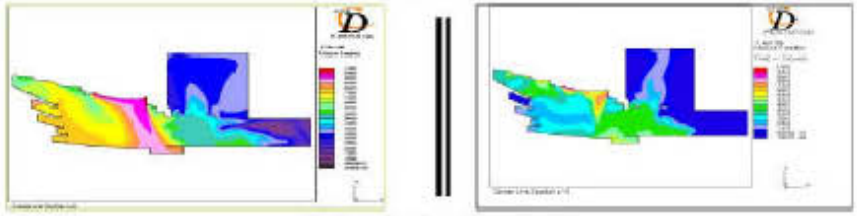
Modified HVAC System



VELOCITY FIELD



TEMPERATURE FIELD



MIXTURE FRACTION FIELD