

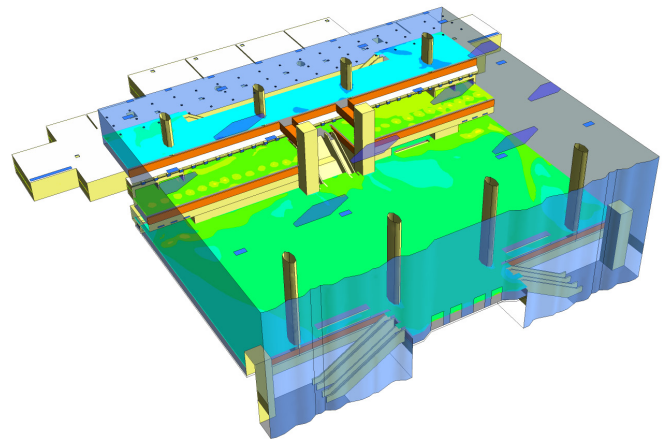


# International Airport Luanda, Angola

## Introduction

In Luanda, Angola, a new international airport will be built. Since the Angolan climate is hot and humid special attention is given to the air conditioning system. On request of the client and consultants the system performance is investigated by CFD simulations for the main entrance hall. The hall is about 15 m high and is surrounded by a double skin façade. The large glazed area results on a high thermal load by radiation and transmission.

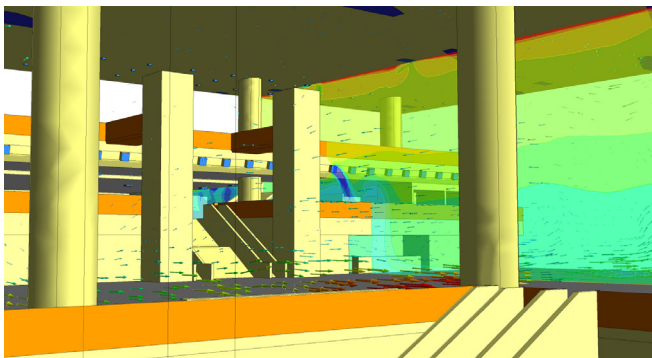
With the CFD simulations detailed information is provided regarding air speeds, temperatures, radiation intensity, humidity and many more parameters taking into account several physical phenomena. In such a simulation a geometry is supplied with a calculation grid wherein mass-, energy-, and momentum balances are solved. The resulting comfort factors PMV and PPD according NEN-EN-ISO 7730 are calculated.



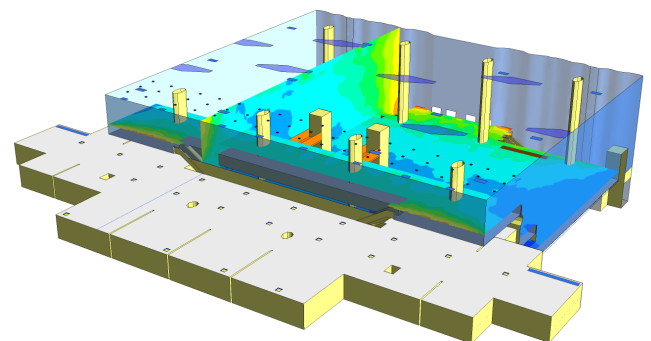
Resulting Predicted mean vote at occupant level.

## Results

Using the CFD results the consultants have optimized the system design to achieve the requested indoor climate. The CFD simulation results of the final proposed ventilation system indicate in general PMV (Predicted Mean Vote) values between -1 and 1, corresponding with a PPD (Predicted Percentage of Dissatisfied) of less than 10% at most locations. Occupants will experience a neutral internal climate. The biggest influence on the PMV comes from radiation from the sun.



Air flow distribution in the main hall.



Radiation intensity through the façade.