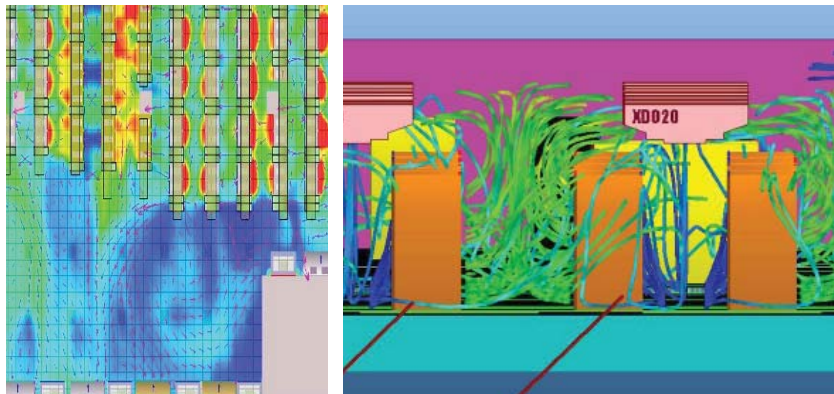


## CFD Analysis

Considered extravagant just a few years ago, Computational Fluid Dynamics (CFD) Analysis used as a tool to achieve an efficient mechanical system, is now considered a basic requirement for data center design. As power densities increase and blade server technology becomes common, engineers can no longer simply pump cold air into the space randomly and assume the equipment will receive the cooling needed.

Today, mechanical system designs are closely aligned with the rack layout, as well as the specific equipment being installed. The design firm needs to model the data center analyzing the cooling systems efficiently under a variety of equipment installation scenarios and overall projected growth plans. Additionally, the engineers need to study the effects of various failure events to assure the overall system is fully tolerant.

The ultimate goal is to achieve a design that delivers the cooling where it is specifically needed so that the system runs efficiently. Operators do need to ensure that the CFD models are updated on a regular basis; this should be used in planning the installation of new systems.



Often when planning a new facility *idGroup's* clients will have only a general idea of what systems will be installed over time. Typically, our engineers will review installation projections that include rack counts for three or four rack configurations, often ranging from 2-20kW per rack. Almost always, our clients have a majority of low density racks with plans to migrate these into more high density systems over time. Our engineers work to optimize a system that runs efficiently on Day One and can be easily expanded as more equipment is installed. The operator needs to refresh the CFD Analysis as actual power densities become available. When each rack can be identified with a specific heat load and equipment arranged, the CFD model can be easily updated to provide significantly better analysis for optimizing systems.

Operators should continue to utilize the CFD model and experiment with alternative scenarios for planning the installation of new servers and other equipment to determine if the MEP system, as installed, can meet the updated demand of supplemental cooling is required.

By using the CFD model as a proactive tool, operators can stay ahead of the curve and assure a reliable facility.