A Series of Studies on Air-conditioning Systems for a High Heat Density Equipment Room

HAYAMA Hirofumi
Professor, Hokkaido University, Graduate School of Engineering

This series of studies relates to air conditioning facilities for rooms accommodating IT equipment that generates large amounts of heat. To ensure that this equipment is cooled reliably and efficiently, we focus on three main points: (1) optimizing the thermal environment inside the room, (2) improving the efficiency of the air conditioning facilities, and (3) ensuring that these facilities operate reliably. We systematically organize issues that cross the boundaries between different industrial fields — IT equipment design & construction (manufacturing industry), architecture and operation of information services (service industry), and air conditioning equipment design & construction (construction industry) — and quantitatively clarify the measures to be taken and the effects of these measures. The results of these studies are compiled into highly practical form.

The results of this research are applicable to the design, construction and operation of approximately 5 million square meters of DCs in Japan, and the approximately 40,000 air conditioners running inside them. They can also be applied to the design of air conditioning equipment in DCs belonging to other operators, and to manufacturing facilities equipped with machine tools or printing machines. This will contribute to energy savings, reliability improvements and economic benefits at each facility.