PROJECT REPORT:

Blue Waters Supercomputer

Blue Waters Supercomputer Cooled by Series 3000 Cooling Towers

In 2011, on the campus of the University of Illinois at Urbana-Champaign, a supercomputer of unprecedented power will be unveiled by the National Center for Supercomputing Applications (NCSA) and it will be cooled by Series 3000 Cooling Towers. This IBM system named Blue Waters will be one of the top supercomputers in the world.

Supercomputers are typically cooled by air cooled systems. However, for IBM Power7 hardware, a water cooled system is used which is much more energy efficient. Blue Waters will be cooled by water that is being pumped through very small pipes running across its circuit boards, allowing the components to be closer together and cutting down on internal communication time. According to IBM, by using water cooling the energy requirements will be reduced by 40 percent when compared to traditional air-cooled systems. Additionally, the cooling towers will provide free cooling for approximately nine months of the year. Water alone is what enables Blue Waters to have its speed while also being energy efficient.

Three 31056C Cooling Towers *(Photo Courtesy of NSCA)*

The cooling towers selected for this job were three 31056C Cooling Towers. The materials of construction for these units include galvanized steel with upgraded stainless steel hot water basins and welded stainless steel cold water basins. These cooling towers run on belt drives for easy maintenance and compatibility with variable speed drives. Kent Reifsteck, Manager of Engineering Services for the University of Illinois at Urbana-Champaign estimates, "over the five year life span of the supercomputer, there will be $20 million saved in cooling costs because of these cooling towers."

In addition to cooling the Blue Waters supercomputer, these cooling towers will also provide water to air-condition the building. The National Petascale Computing Facility will achieve LEED® Gold certification for energy efficiency, thanks in part to the cooling towers.

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