



United Technologies  
turn to the experts

# SHANGHAI IFC



## Shanghai IFC

Shanghai International Financial Center (IFC) is located in Lujiazui CBD. It was designed by Caesar Pelli, who is the chief designer for HK IFC. The design for shopping mall is charged by Benoy Architects from APM. This project is invested by Sung Hung Kai Properties, includes 1,100,000 m<sup>2</sup> for shopping mall, two 5A office buildings and two five-star hotels.

The total cooling capacity for Shanghai IFC is more than 20,000 tons, which air-conditioning area is larger than 400,000 m<sup>2</sup>. Carrier supplied six units of 2850 tons 19XRD and three units of 1000 tons 19XR centrifugal chillers.

**Location:**  
Shanghai, China

**Project Type:**  
Chiller plant optimization

**Building Function:**  
Commercial center

**Area:**  
400,000m<sup>2</sup>

**Objective:**  
Improve chiller plant efficiency

**Design Concept:**  
Optimize the operation of CTs, pumps and chillers to improve the efficiency of chiller plant.

**Chiller:**  
19XR1000 \*3  
19XRD2850 \*6

### Advante<sup>3</sup>C Solutions:

In Nov. 2011, Carrier Advante<sup>3</sup>C center proposed chiller plant optimization solutions after detailed analysis for IFC chiller plant historical operating data, with the purpose of improving the entire chiller plant system operating condition, enhancing the chiller plant system efficiency and reducing the operating cost.



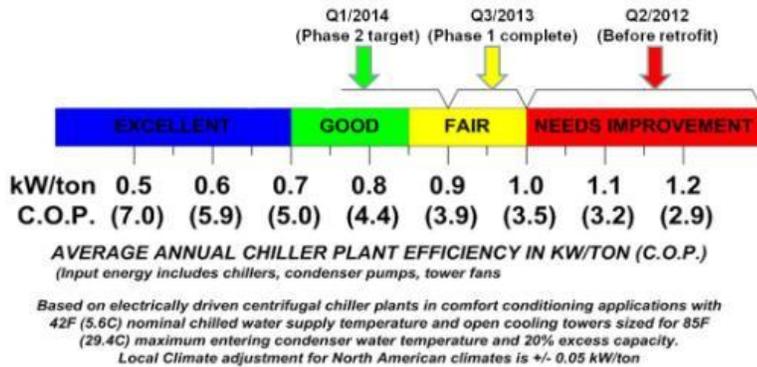
**Until now, annual average chiller plant efficiency has been improved by >30%.**



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The retrofit work for chiller plant optimization was finished by Aug 2012. Actual operating data shows that, after CPM750 was applied, the annual average chiller plant system efficiency has been improve by above 30% and about more than 9,000,000 RMB saved until Dec 2013. Moreover, if more advanced solutions could be applied, the efficiency even could be further improved.



Source: ASHRAE Journal, 2001, 43(9):43-53.

Efficient chiller plant management can save enormous amounts of energy cost. Therefore AdvanTE<sup>3</sup>C center customized CPM750 for IFC chiller plant. CPM750 is Carrier's advanced control system including a series optimal control strategies to optimize the whole chiller plant operation under actual conditions. Certainly, the system efficiency will be greatly improved!

Following were some of CPM750 modules used for IFC chiller plant:

1. Chiller auto start/stop according to OAT and real building load
2. Auto optimize LCHWT based on system operation status and OAT
3. Optimize cooling tower staging control
4. Optimized anti-reverse flow control in primary-secondary system to ensure stable operation.
5. Sensor self-diagnose to ensure system efficient operation
6. Chiller plant monitoring system to show system operation status and energy consumption of each part.

## AdvanTE<sup>3</sup>C Solutions Center

In April 2011, Carrier AdvanTE<sup>3</sup>C solutions center was set up in Shanghai. The center is dedicated to developing sustainable building solutions. Based on Carrier innovative core values, AdvanTE<sup>3</sup>C offers clients solutions capable to achieve higher energy efficiency.

Through the establishment of AdvanTE<sup>3</sup>C solutions center, Carrier has enhanced its ability in air-conditioning system tailored to clients to offer innovative solutions including heat recovery, inverter technology, central heating, energy storage, water source heat pump systems, air terminal and other technologies, which will better address the special needs of clients with strong support for sustainable building performance.



19XR Centrifugal Chiller



19XRD Centrifugal Chiller



WebCTRL System



Carrier Control Network



Carrier AdvanTE<sup>3</sup>C Solutions Center