Qinghe Power Plant Application Story

DCS upgrade using RTP 2200 Hybrid Control System at Qinghe Power Plant

Introduction

Qinghe Power Plant is located in Qinghe, Tielin County, LiaoNing Province, China. With maximum capacity of 1,200 MW, it was formerly one of the largest power plants in China. In 1999, the decision was made to upgrade its chemical water treatment plant instrumentation. The job was awarded to Citect (Ci Technologies Inc, Shanghai). After upgrading the system, the level of automation at the water treatment plant has increased, while process costs have decreased, and profits retrieved by the project have met the plant's investment expectations.

Citect uses the new generation RTP 2200 Hybrid Control System to monitor and control the entire process, to guarantee the continuous BFW (Boiler Feeder Water) supply to the boilers as well as normal running of the boilers, turbines and power generator system.
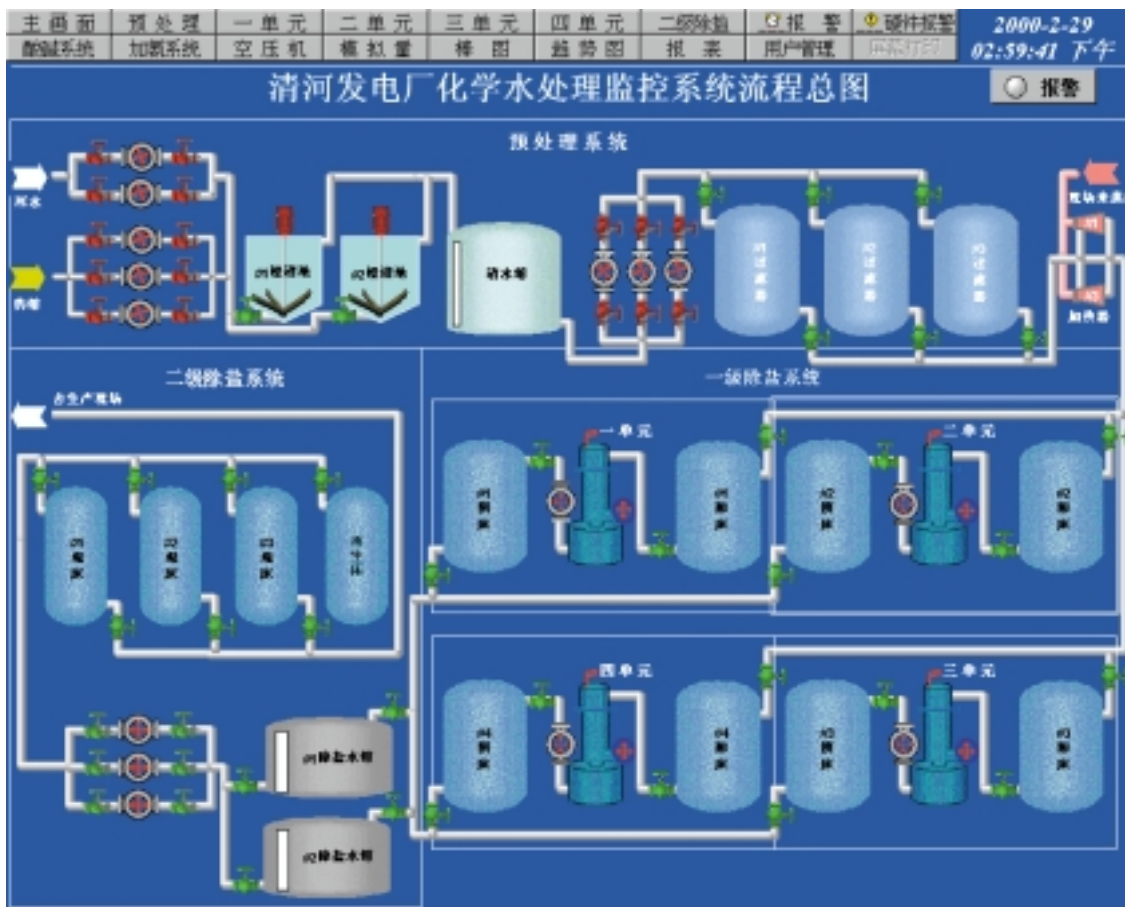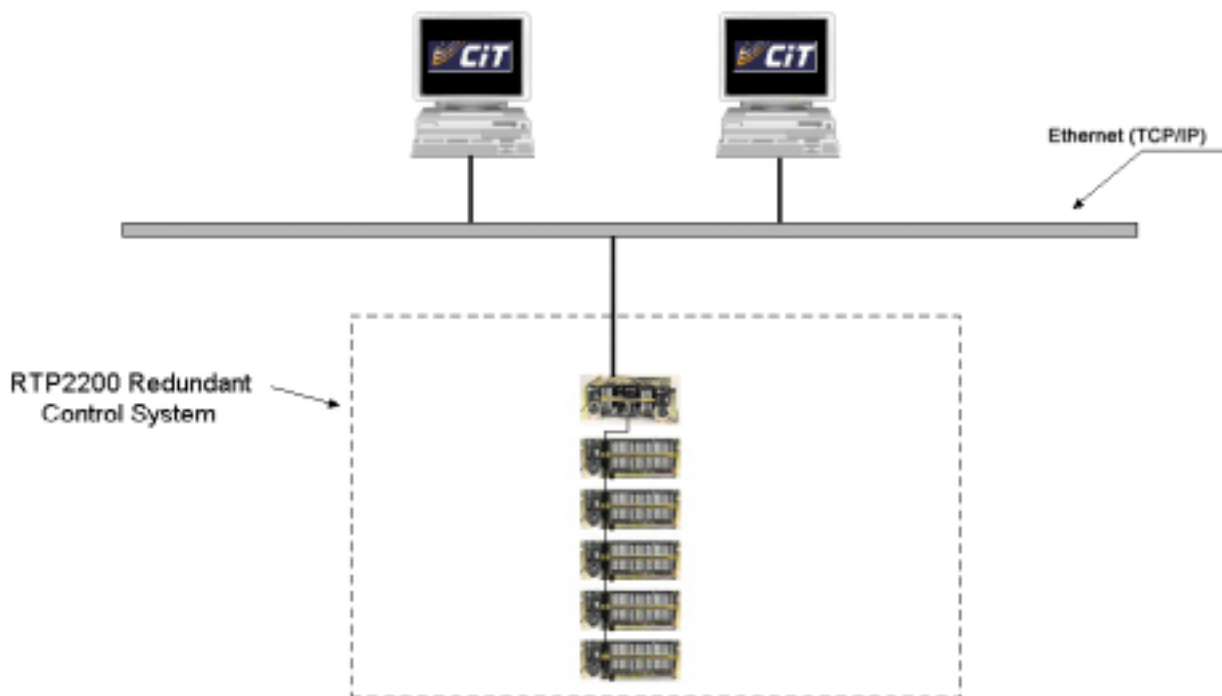

Figure 1 water treatment plant overview

Figure 2 system architecture

System architecture

With the help of both of Citect and site engineers, the customer was quite satisfied that the project was quickly completed. The system includes:

Analog input points 72
Analog output points 16
Digital input points 400
Digital output points 320

Total I/O points .... 800+

An RTP 2200 Hybrid Control System with redundant target node controllers communicates with two Citect operator stations via the plant's Ethernet network (refer to Figure 2, above). The network is also shared with the plant's MIS (Manufacturing Information System) computer (not shown).

Chemical water treatment process is a typical batch process, which requires the control system be real –time, high speed and robust.

Robustness

The RTP 2200 Distributed Control System is configured with redundant power supplies and target node controllers. Redundant operator stations add to the system's robustness.

High speed

The high speed dynamic link technology by which Citect 5.21 HMI software communicates with the RTP 2200 Hybrid Control System, guarantees high system performance. Operator station screen updates is less than 1 second; and the scan cycle time of the control program running in RTP 2200 is less than 50 milliseconds.

"RTP has solved the problem for a control system to simultaneously support complicated floating point calculations and the high-speed of a PLC," said a senior site engineer with more than 10 years system integration experience.

The RTP system is using object oriented NetArrays graphical configuration tool (shown in figures 3 and 4, above), which helps customers easily build their own configuration with its flow chart, modular pages, ladder logic, and C++ user defined modules. The RTP target node controller has a large program space with a RAM size up to 16 MB. Five hundred module pages are configured in Qinghe project; and the compiled program size is 650 KB.
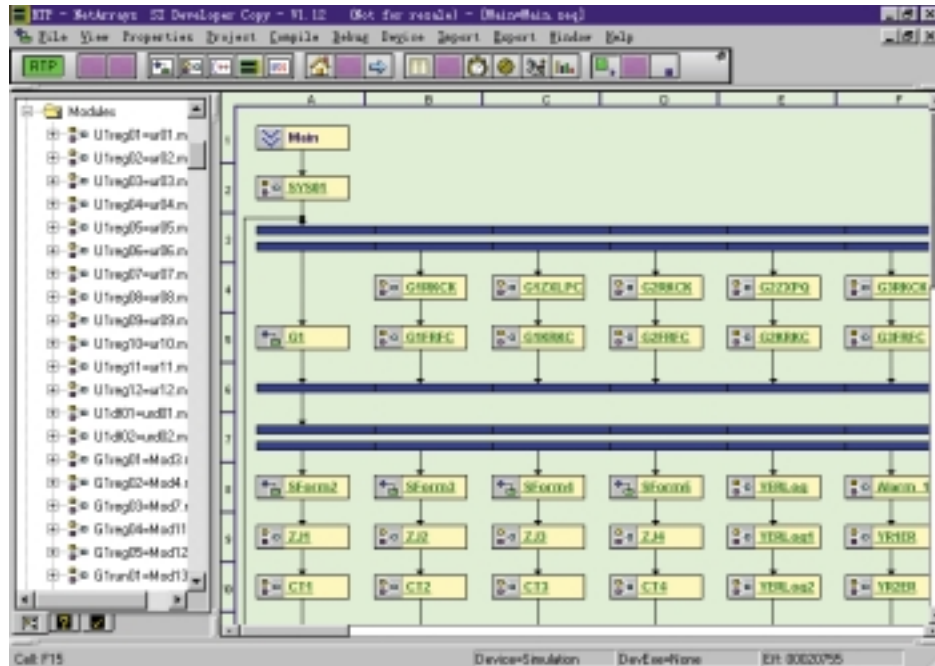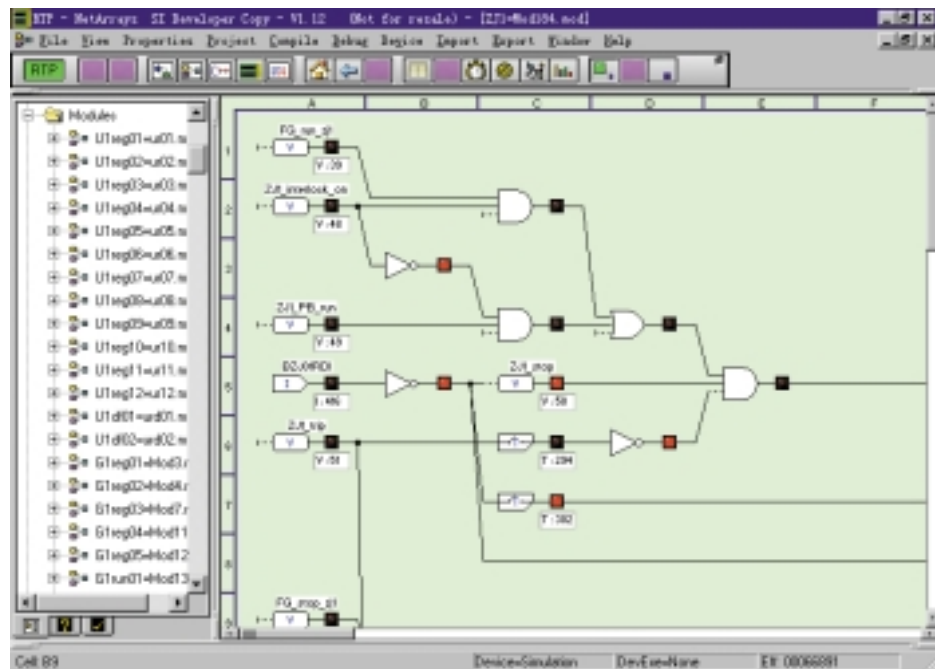
Figure 3 sequential forms configuration display

Figure 4 NetArrays object-oriented configuration