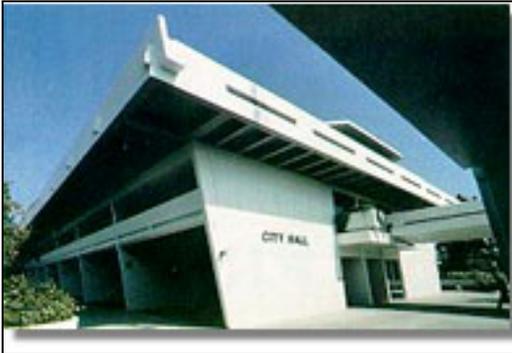


West Covina City Hall – Hartman Loop Case Study



Background:

Southern California City of West Covina, population 111,000, dedicated resources to improving their environment by modernizing the aging infrastructure of their building mechanical systems at their 24/7 85,000 square foot civic center and police station complex.

City council members voted to take out a loan and modernize every system from the air distribution, building controls, central plant, and boiler plant. Central plant controls by Armstrong along with dual arm pumps maximized energy savings and utility rebate.

"We just look at the numbers."

Mike Shott, City of West Covina

Value Stream	Rating	Activity/Item
Best Performance Value	✓✓	IPC11550, Dual Arm Pumps
Installation Savings	✓✓	Dual Arm Pumps, Less Piping
Space Savings	✓✓✓	Use of Vertical Inline 4382 pumps
Project Risk Minimization	✓✓	Single Source Responsibility
Improved Energy Efficiency	✓✓	Integrated System – Pre-Optimized
Improved Maintenance	✓✓✓	Use of Vertical Inline 4382 pumps and Oil Free chillers
Optimized Redundancy	✓✓✓	Space saved by Dual Arm Vertical Inline pumps enabled redundant pumps to be installed without having to compromise tenant space.
Best Practice Operation	✓✓	Lowest Carbon Footprint

General Description:

The Civic Center complex built in 1963 originally used two fixed speed reciprocating chillers, fixed-speed base-mounted pumps and crossflow cooling tower serving multizone air handlers. The energy bills were substantial with a central cooling plant averaging over 1.6 kw/ton annually.

Building Operations Manager, Mike Shott, found out new technologies could save money for the city. "We got an extra \$80,000 in rebate for an additional \$140,000 expenditure [to purchase Hartman Loop and Turbocor chiller]." Shott said. The new central plant has been averaging .4 kw/ton since its installation, a 75% improvement in central cooling plant electrical usage. According to Shott "We just look at the numbers, with that rebate it made all the sense in the world to spend the money."

"To save floorspace and piping, dual arm pumps were

chosen" explained Don Allison, president of Allison Mechanical Inc. "The Dual Arm made the piping retrofit less complex and less expensive, while still allowing redundancy to be built in." The implemented Hartman Loop controls coupled with variable speed frictionless Turbocor compressors took advantage of the high quantity of part load hours. "That Smardt chiller has run like a top!" said Allison.

Technical Details	
Cooling Capacity CWP	240 Tons
Operation Time	24 Hours 7 Days
Pumping Config Chilled	Variable Primary
Pumping Config Condenser	Variable Primary
Cooling Tower Type	Induced Draft Counterflow Evapco AT
Pump Models	4382 - Armstrong
Chiller Type	Oil Free – 3 Compressor Smardt
Control Sequence	Hartman Loop – All Variable
Control System	Armstrong IPC11550



Main Equipment

- The Armstrong Hartman Loop Integrated Plant Control system, IPC11550
- Dual-Arm 4382 Pumping for both condenser and chilled water
- To optimize turndown and take advantage of the sustained cold 56 degree condenser water, a single 3 compressor oil-free Smardt chiller replaced the two reciprocating machines
- Evapco AT Induced Draft counter flow cooling tower replaced a badly scaled crossflow tower



4382 Pumps Installed

Project Details

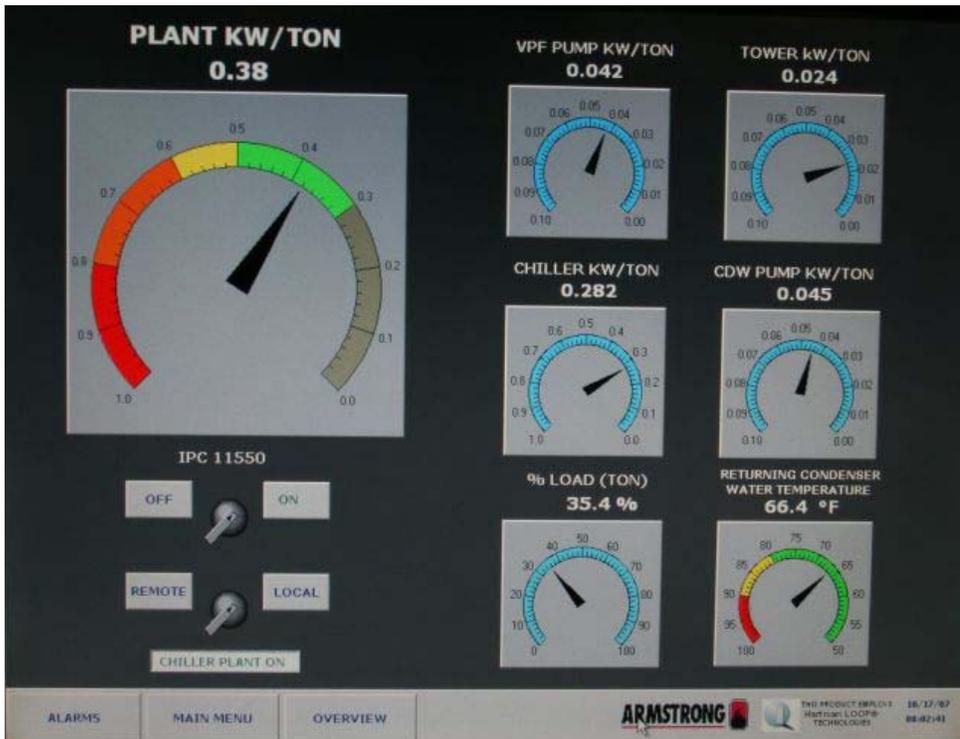
The City of West Covina required fast payback and efficiency. The design-build, contractor-engineered project required solutions that delivered “out of the box” performance to maximize rebate while keeping system complexity to a minimum.

Integrating the advanced Hartman Loop controls into a pre-wired single point power controls skid simplified construction, rigging and sale. The complex task of delivering ultra efficient chilled water supply is simplified to an elegant unitary solution with IPC11550. Hartman Loop relative demand based control logic finds the cooling system’s natural efficiency curve and optimizes all central plant components to eliminate over-pumping over the entire load range.

The design portion of the project consisted of a jobwalk, an engineered proposal, and a payback analysis. Subsequent meetings with the utility representative, Brad Bergman of Intergy, confirmed the rebate based on independent performance models and comparative performance analysis. “It

was a very short sale, as we were ready to purchase a screw chiller and base mounted pumps before this solution came along.” said Allison.

Pumping Equipment Details	
Pump Service	Pump Detail
Chilled Water	4382, Qty = 1, 15HP, 6x6x8, VFDs
Condenser Water	4382, Qty = 1, 15HP, 6x6x8, VFDs



IPC11550 Screenshot of actual plant performance