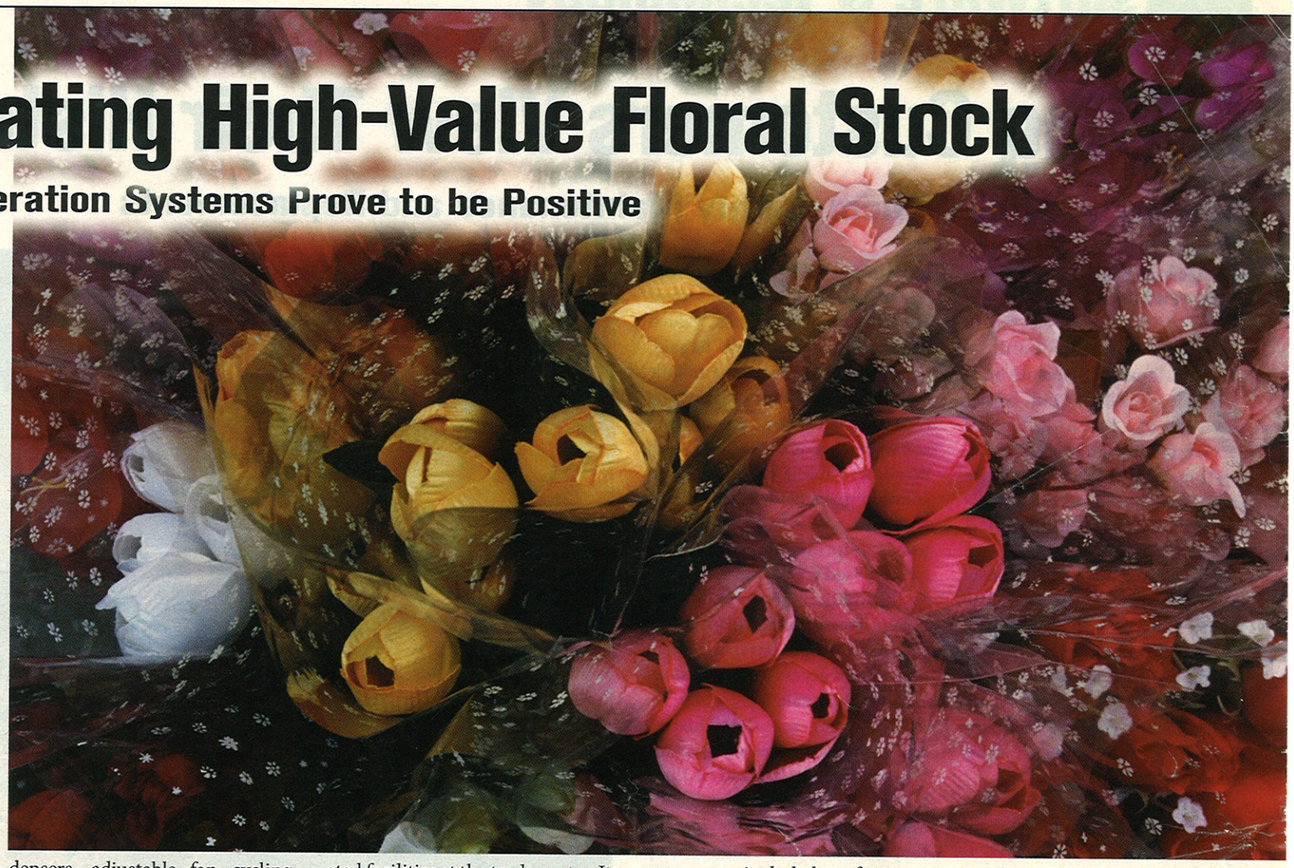
Refrigerating High-Value Floral Stock

Replacing Refrigeration Systems Prove to be Positive



Floral stock providers and wholesalers demand effective and efficient refrigerated storage for their products. Customers demand quality, good shelf life, and aesthetic considerations when buying and arranging floral products. With this in mind, the Carltas Corp., manager of the San Diego International Floral Trade Center, contacted San Diego Gas and Electric (SDG&E) for assistance. SDG&E, together with Kohlenberger Associates Consulting Engineers Inc. (KACE), Fullerton, Calif., initiated a feasibility study in an effort to identify opportunities for major system upgrades of floral display cases at the trade center.

Glee Schmidt, general manager of the trade center, managed the overall study effort and recognized the need for prompt action in order to modernize the aging central refrigeration systems. "We had been utilizing a 1970s-era central glycol distribution system originally installed for computer chip manufacturing," she said. Major equipment was failing and modernization was long overdue."

Several important factors were considered in the feasibility review process. These included the concerns over changing out the mechanical refrigeration system while preventing loss of product and business interruption, reducing system complexity, increasing overall reliability and energy efficiency, and providing for future growth. All the while, budget constraints were ever-present.

KACE's team prepared a trade-off analysis detailing the various system improvement options. Existing energy usage was documented through use of real-time monitoring hardware while projected energy usage and savings figures were modeled using customized spreadsheet software. The complete replacement of the aging systems with new, high-efficiency air-cooled equipment appeared to be a viable option.

Next, KACE turned to the Refrigeration Equipment Specialist Co. (RESCO), Tustin, Calif., representatives for Century Refrigeration of Pryor, Okla., for the refrigeration equipment. RESCO's Mike and Tom Nau assisted KACE with the selection of high efficiency, air-cooled, R-22 packages totaling 40 horsepower. After a project bid process, Mechanic Refrigeration, La Mirada, Calif., installed the roof-mounted units complete with oversized condensers, adjustable fan cycling, etc. Inside the many conditioned floral spaces, Mechanic Refrigeration installed 18 low velocity/low temperature difference-designed air defrost evaporator coils.

Meanwhile, the on-site controls contractor, Emre Schveighoffer, president of National Resource Management Inc. (NRM), Boston, had recently installed a refrigeration control system in one of the larger tenant's air-cooled refrigerated facilities at the trade center. It happened to be one that was not tied in with the old glycol loop.

The tenant's new control system reduced energy by cycling evaporator fans along with resetting room temperature set points during low-load periods. NRM and KACE evaluated these measures and a number of other energy saving measures for use with the new equipment upgrades for the overall central system. Additional measures included refrigerant management and defrost scheduling improvements. Finally, NRM's use of remote system management tools, complete with internet protocol (IP)-based hardware, allowed real-time monitoring and system management.

After system commissioning, energy reduction appeared in-line with projections if not slightly better, according to those involved with the project. After nearly 12 months of operation, the overall refrigeration systems savings approached 30 percent, resulting in an annual cost savings of nearly $45,000.

An incentive of nearly $110,000 (offered through the SDG&E Standard Performance Contract) was realized by the Floral Trade Center ownership. Overall projected simple payback is approximately three to four years, according to project coordinators. ■