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Win-Win-Win with Shared Savings

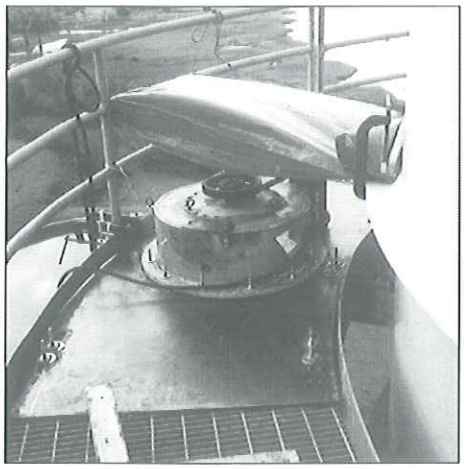
Shared-savings financing, ANCO's recent addition to its portfolio of energy management services, is a classic example of a win-win-win scenario. By "sharing" a portion of the energy bill reduction resulting from an energy management project to repay a 100% project loan, the customer, the utility and the rest of the utility's customer base "win." In a typical shared-savings project, the customer keeps between 10 to 25% of the energy bill reduction while the project loan is being repaid, and 100% thereafter, thereby realizing the immediate benefits of new, high-efficiency equipment and/or measures with no initial cash outlay and improved cash flow. Meanwhile, the local utility is able to promote energy management without burdening their customer base with rate increases.

Shared-savings has been used as an energy-related financing tool since at least the 1930's. In the wake of retail wheeling, however, it has increasingly been seen as an alternative to traditional ratepayer-sponsored Demand Side Management programs as a means of delivering energy services. While widespread deregulation is still far from being a national reality, pending and actual retail wheeling agreements in California, Michigan and New York have fueled speculation that ratepayer-sponsored DSM will likely disappear as the impact such programs have on rates proves to be unacceptable in a competitive marketplace.

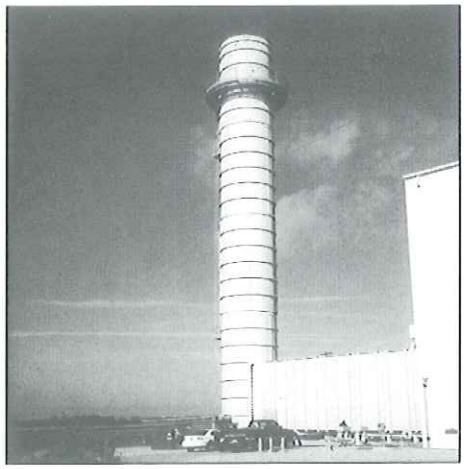
If the electric industry does become truly deregulated, ANCO believes that energy management services will become more critical than ever. Not only will avoided cost issues be even more significant in a competitive market but the type of customer services now subsidized under DSM programs will be a means of differentiating one utility's similarly priced power from another's. Shared-savings has the advantage of allowing utilities to promote these energy services, increase customer service, and maximize internal marketing strategies without negatively impacting rates.

ANCO provides commercial and industrial utility customers complete turnkey project implementation services including initial walk-through and comprehensive on-site energy audits, engineering of recommended measures, coordinating installation of recommended measures, complete project support and maintenance as well as 100% shared-savings financing. We believe this represents one of the most attractive means of delivering energy services to the utility customer base now and well into the next century.

Tests Increase Stack Design Margins



The ANCO MK-18 vibrator at the top of the stack



125 ft Braden stack for a 100 MWe combustion turbine

In order to measure structural damping values appropriate for use in wind-induced vibration fatigue design, ANCO performed forced vibration tests on a 125 foot Braden Manufacturing steel exhaust stack. This stack serves a Westinghouse 100 MWe combustion turbine at the South Carolina Electric and Gas Company Hagood plant in Charleston Heights, South Carolina.

General industry guidelines (ASME STS-1-1992) suggest that the first mode damping in lined steel stacks can be as low as 0.3% to 1.0%. Braden, of Tulsa, Oklahoma, has supplied scores of these stacks and suspected that stack damping would be higher, hence having lower wind vortex shedding response and higher fatigue design margin. ANCO performed forced vibration tests on the stack using a sinusoidal eccentric mass vibrator mounted near the top of the stack. The vibrator produced forces up to 5 tons and stack response levels up to 0.4 g.

The tests showed that the Braden stacks had first horizontal mode damping (in each direction) in excess of 2.0% at response levels above about 0.3 g. Consequently, Braden is now confident of higher wind fatigue margins in their stack designs. Such studies result in more robust and economical structures.

ANCO Moves Headquarters and Laboratories to Colorado

Early in 1995, ANCO completed moving its headquarters, administrative and technical staff, and seismic testing laboratory from Culver City, California, to Boulder, Colorado. "After nearly twenty-five years of doing business from California, such a move was a challenge involving significant tradeoffs," indicated Dr. Paul Ibanez, ANCO President, "and was carried out only after carefully weighing many factors, including the geographic location of our customers, and the comparative quality of life and operating costs in California and Colorado." ANCO continues to serve our California clients with a Los Angeles area office.

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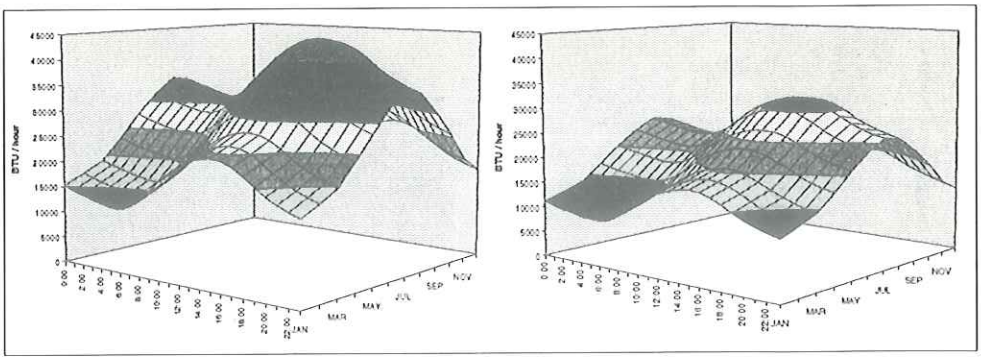
Ice Plant Audit

50% Demand Reduction



Heat leakage, under average weather conditions, of existing roof (left) and with replacement insulation (right)

ANCO recently completed an energy audit of an ice plant, conducted under Public Service Co. of Colorado's *Customized Industrial Process Efficiency Solutions (CIPES)* program. This survey and analysis revealed the potential for a reduction in electrical demand (kW) to about 50% of its present 1,400 kW value. A particularly broad array of demand and energy-reducing measures (from motor upgrades to automatic freezer room doors) were identified as warranting consideration.

PSCo's *CIPES* program encourages its industrial customers to reduce their electrical demand by sharing the cost of an energy audit; and thereafter by negotiating customized financial incentives to implement the study's recommendations, including the possibility of fuel switching.

This ice plant has been operating since before the turn of the century. Certain of its existing compressors and motors date to the 1920's. Nevertheless, except for elevated refrigeration loads caused by old and degraded freezer room roof insulation, the efficiency of its overall operation is typical of similar ice making installations. The plant produces block and cube ice, blast-freezes packaged foods, and stores all of these in freezer rooms at several different temperatures.

High pressure liquid ammonia is distributed, from a single header, to the block and cube-ice production areas, as well as to the various freezer rooms. Returning ammonia vapor is compressed by an array of one and two-stage compressor types, which discharge through several paralleled evaporative and liquid-cooled condensers back into the same header.

This configuration presented a major analytical hurdle because, without an installed ability to measure the flow of refrigerant to the various end uses, it was necessay to fall back onto a combination of basic thermodynamic principles, equipment performance data, operating logs and handbook rules of thumb to estimate the distribution of actual refrigeration loads.

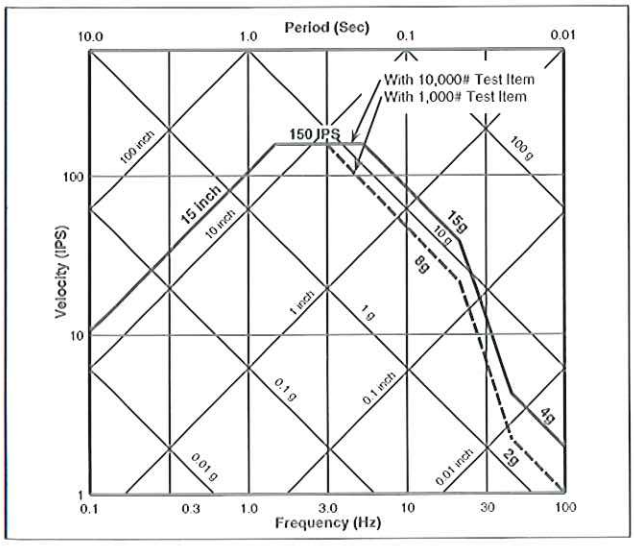
The demand reducing measures identified by this audit and the contribution of each to the total potential demand reduction (adjusted for interaction effects) are

Replace Roof Insulation	28%
Automatic Doors	12%
Separated Suction Returns	13%
Reduced Head Pressure	10%
Subcool Liquid Ammonia	2%
Motor Replacement	4%
Natural Gas-Driven Compressor	31%

The financial attractiveness of these measures proved to differ markedly. For example, replacing the roof insulation averaged a 17-year payback, while automatic doors will return their investment in 5 years. By contrast, if this facility were located in Southern California Edison's service territory, the preceeding payback figures would be accelerated by a factor of 2 because of SCE's higher charges for both energy and demand.

The accompanying figure compares the thermal heat leak for a typical freezer room before and after replacement of the degraded roof insulation.

5 Ton Triaxial Table Delivered to Astro Nuclear/Dynamics



Typical achievable 5% damped response spectra for the R-6HP

Seismic shake table technology was strongly influenced by the work of Fischer and his colleagues in the 1960's and 1970's at the Westinghouse seismic testing facilities in Large, Pennsylvania. This facility eventually installed several pioneering shake tables and shock testing machines, and was the site where many of the concepts for the industry seismic test standards (IEE-344) were developed and verified. In 1992, Astro Nuclear/Dynamics, Inc. (ANDI) purchased the test facilities in Large from Westinghouse and has continued to offer equipment qualification and dedication services to the nuclear industry, as well as to upgrade the test facilities.

As part of this upgrade, ANDI has contracted with ANCO to deliver a five ton capacity independent triaxial shake table (model R-6HP), data acquisition system, and digital chatter monitoring system. This independent triaxial system will supplement the existing vector biaxial tables at ANDI. The R-6HP is capable of peak to peak displacements in excess of 8 inches, peak input velocity of 50 in./sec, and peak acceleration (ZPA) of 2-4 g's, depending on the test specimen weight. Peak spectral accelerations of 15 g's on a 5% response spectra are possible. The table top is in the shape of a hexagon, 10 feet across the flats.

Using the R-6HP, ANDI will be able to achieve spectra that will test power plant and telecommunication equipment for almost all sites and building locations, and meet the requirements of such industry standards as IEEE-344-1987 and Bellcore TR-NWT-000063.

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