TAKE 5 FOR ENERGY CONSERVATION!

KERN energy watch

Kern Medical Center

Central Plant Updated at Kern Medical Center

In 2012, the Engineering Department at the county-operated Kern Medical Center (KMC) had a terminal patient on their hands in the form of an old, outdated, energy-devouring Central Plant. The Central Plant acts as the heart of the hospital running the operations of the building. Dave White, Energy Coordinator for the County of Kern recalls, "We wanted to manage energy use throughout the hospital more efficiently." But it seemed like an insurmountable task when working with a physical plant that had its beginnings in the 1950's and was a hodge-podge of equipment and buildings. After talking with PG&E, it was decided to bring in kW Engineering to perform an energy analysis. The prescription: replace the old central plant with a modern, energy-efficient computerized facility, starting with new chillers and boilers while replacing the heart of the system with digital equipment.

The goal was to capture heat that would normally escape from the HVAC system (heating, ventilation, air conditioning) and to save it to be transferred to other areas of the system as needed. Heat is a form of energy, so the more heat that could be collected and reused, the greater the decrease in electricity and natural gas usage. Kern Medical Center treats approximately 43,000 patients in the Emergency Room, 100,000 visitors in the clinic and 16,000 inpatients annually. In order to serve Kern County, there needed to be energy efficient improvements resulting in long-term financial savings.

Since the 1860's there has been a Kern County hospital at this location.

Each of the seven wings of the hospital had their own independent HVAC equipment such as boilers, chillers and cooling towers. Efficiency could be increased by removing the seven HVAC plants and transferring the load to a new central HVAC plant. The air handling system of air ducts remained intact in each wing. Perhaps the most dramatic change was replacing ten boilers with two boilers, holding the same volume. The old system allowed heat to escape into the boiler room. A large amount of the water used in the old system evaporated into the atmosphere. The new system runs at nearly 95% efficiency, conserving water and heat energy. Through the use of an economizer, that heat is now captured and used to preheat water up to 170° F. As the demand for steam increases, the water is heated to roughly 212° F to produce steam. Further, an absorption chiller was installed to utilize recovered heat to compress steam into a refrigerant. This decreased the cooling load served by the electric chillers during PG&E peak billing periods.

Manual analog controls were replaced with a complete computerized state-of-the-art

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control room providing the ability to make automatic adjustments. This allows engineering personnel to check the system load and make modifications quickly when needed. Another added benefit is the ability to control the temperature in specific areas or rooms in the hospital. For example, the surgical suites need cooler environments than other rooms, resulting in different temperatures throughout the facility. Medical personnel can call in a request to the master control room and with a few strokes of the keyboard, cooler, life-giving air is on the way. The updated system has also reduced the noise level that permeated from the old system throughout the hospital.

Incentives paid to the County for Kern Medical Center were based on estimated annual reductions in electricity use (207,636 kWh/year) and natural gas use (705 therms/year). PG&E provided Kern Medical Center with an incentive of $37,715 for the retrofit.

The construction of the new HVAC plant for KMC

KMC Project by the Numbers

Estimated Energy Savings for KMC

Electricity	**207,636 kWh/Year**
Natural Gas	**705 Therms/Year**

Translation of Annual Savings*

207,636 kWh	**Powers 32 Homes**
705 Therms	**Heats 1.7 Homes**

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*These estimates can be calculated at www.pge.com via Carbon Footprint Calculator Assumptions.

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