CASE STUDY

Controls Contribute to 40% Energy Savings in Kaiser Permanente Warehouse

Kaiser Permanente

Northern CA

Kaiser Permanente is a leader in the health care industry when it comes to energy conservation. For over 20 years it has worked to reduce energy use and costs – from energy-efficient lighting upgrades, to harnessing renewable and sustainable energy to help power its hospitals, medical offices, and other buildings.

WattStopper Products Used:

HB High Bay Occupancy Sensors with aisleway and 360° lenses; DW-200, WA-200, WA-300 and UT-300 Occupancy Sensors; TS-400 Digital Time Switch; and MSC100 Clock.

Managers of a 350,000 square foot Kaiser Permanente distribution warehouse in Northern California were dissatisfied with the facility's lighting. Task illumination was ineffective, maintenance was difficult, and energy use was high. To improve the situation, they decided to completely retrofit the lighting and add energy saving controls.

Robert Ofsevit, vice president of Concord, California-based Alamo Lighting, coordinated a turnkey upgrade, including over 400 WattStopper occupancy sensors and time switches. More than a year after completion, Ofsevit's design is exceeding expectations for performance and energy savings.

Warehouse lighting

Prior to the upgrade, much of the lighting remained on close to 24 hours a day from Sunday night through Friday afternoon. The space was lit with metal halide, high pressure sodium and older fluorescent sources. Light distribution was poor: illumination levels were insufficient for many tasks, but were far too high in some areas.

Before developing a lighting and control plan, Ofsevit assessed the safety requirements of the facility, as well as the tasks being performed. The new controls ensure that lights in many areas are not turned on until they are needed, and are turned off after they are no longer needed.

The new lighting uses just one lamp type – a 5000° Kelvin extra long life 4' T8. Fixture types, reflectors and ballasts were carefully specified to deliver appropriate lighting levels for different areas and tasks. The overall connected load was reduced.

The upgraded fluorescent lighting provides better color rendition, less shadowing and less glare than the old lighting. Additionally, lumen maintenance is better and building maintenance is easier. Both the new lighting and the controls have been overwhelmingly embraced by employees, who now feel far more comfortable working in the space.

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Occupancy sensors turn on individual lights as needed and turn them off following a time delay.

"The lighting upgrade has improved the quality of lighting in both the office area and warehouse, and saved a significant amount of energy and utility costs."

– Marvin Cave
Kaiser Permanente
Facility Manager

Integrating controls

WattStopper line voltage passive infrared (PIR) HB occupancy sensors control individual six-lamp high bay fixtures in the warehouse rack aisles. The PIR coverage, using aisleway lenses, ensures that lighting turns on in each section of the aisle as a worker approaches. Lighting in many rack aisles remains off for much of the day.

HB sensors also control approximately half of the fixtures in high-ceilinged packing areas and in the main aisles, which experience high levels of forklift traffic. The rest of the fixtures remain on during working hours. Keeping sufficient lighting on throughout the space helps workers feel secure and comfortable in the large warehouse space.

Previously overlit under-mezzanine spaces were efficiently retrofit, and a number of these spaces were rewired to create small zones of task lighting. Now, approximately half the fixtures remain on to provide illumination for workers walking through the areas. Workers can turn on the additional lighting in each zone as needed, using a conveniently located TS digital time switch. Lights turn off automatically following the user-selected time period.

Bi-level lighting in private offices is controlled by DW dual technology, dual relay wall switch sensors. Dual technology was selected to best detect small motion. The first lighting level (66%) is switched on automatically upon occupancy. The second level (33%) may be switched manually. In practice the second level is seldom used, contributing to energy savings.

Controls in other areas were selected to suit the unique needs of each space. UT ultrasonic sensors, which can sense around partitions, control open office spaces, lunch and break rooms. A time clock controls energy-efficient lighting in a secure storage area, providing significant savings compared to previous 24/7 operation of older generation T8 fixtures. A low voltage digital time switch is available for after hours override.

Resulting energy savings

Kaiser Permanente's Marvin Cave, Facility Manager, Regional Building Operations, NCAL, notes, "The lighting upgrade has improved the quality of lighting in both the office area and warehouse, and saved a significant amount of energy and utility costs."

Analysis of utility records shows a reduction in energy use, measured in kilowatt hours, of over 40% for the 12 month period following installation. The energy savings will pay back the cost of the upgrade in three years, net of a $71,000 Pacific Gas and Electric rebate.

Selecting the controls

Kaiser Permanente managers selected the winning lineup of design, project management and lighting and control technology based on positive prior experience. The company in 2003 implemented a lighting upgrade with controls at another warehouse facility, using the same team, and that installation continues to perform successfully.

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