Seeing Your Plant In A New Light

Ever-escalating environmental standards mean that the world's most demanding industrial locations are facing a new set of requirements. Not only do they need smart new lighting ideas and innovative approaches to enhancing safety, but they also need lighting that reduces CO_2 emissions, improves energy efficiency and cuts the overall cost of ownership.

These days refineries are not only working to meet the world's growing demand for clean fuels, but they're also investing in the latest technology to improve their own energy efficiency. At this U.S. installation, the company chose to partner with Dialight, an industrial LED lighting solution provider, to implement its new, energy-efficient, safe and environmentally friendly lighting approach. By replacing its traditional lighting with LED fixtures, this refinery has been able to improve lighting quality, reduce its energy consumption, and access many additional business and operational benefits.

Lower Energy Consumption & Costs

As portrayed in this installation, the efficient optics used in LED hazardous location products like SafeSite® enable more light to reach target areas, especially when compared to the previous high-pressure sodium (HPS) installation at the plant. Using lower wattage than conventional lighting, fewer LED fixtures are needed to light a given area. Additionally, more light is focused on straight lines where it is needed, limiting spillover to just a few feet. This not only reduces energy needs, but also cuts installation time and costs, while the LEDs' long inherent lifespan eliminates maintenance. The combination of reduced energy consumption, a 50 percent cut in the number of lighting fixtures, a fixture life warranty of five years with more than 50,000 operating hours and the resulting slash in maintenance clearly produces a low cost of ownership for the plant.

This installation's first priority was safety and better lighting. When refinery employees had to use an additional portable light at night, even with a direct fixture above the equipment, it was clearly time for a change in lighting strategy. Under the plant's previous HPS lighting, color rendering was Ra 30, thus making it difficult for refinery workers to distinguish between colors. Objects appear colorful because they absorb some colors of light and reflect other colors to our eyes. For example, an object that reflects blue and absorbs all other colors appears blue to us. However, this only occurs if the object is illuminated by a light source that emits blue light. HPS lamps, for example, emit almost no blue light, so a blue object will appear very dark. HPS, fluorescent and induction lights are also missing large areas in their color spectrum, and this can further cause colored objects to appear off-color or dark. As a result, extra task lighting was required for certain jobs, like electrical maintenance, so refinery workers could correctly identify cable colors. In contrast, Dialight's SafeSite LED fixtures are full spectrum, meaning there are no

gaps in the spectrum. This lighting method provides bright, vibrant illumination of all objects, thereby optimizing visual acuity, reducing eye strain and creating a safer work environment when maneuvering, reading placards or identifying color-coded wiring. This eliminates the need for portable lights to get the job done safely by improving access to plant equipment, as well as boosting worker safety with less chance to accidentally slip or trip. The plant was specifically fitted with SafeSite® LED fixtures for Class I, Division 2/Class II, Division 2 applications. These fixtures meet the latest European lighting regulations that affect hazardous locations from oilfields and chemical processing to mining, flour mills and power stations. SafeSite® illumination fixtures can deliver significant value in these locations—whether in new or retrofitted installations—thus making expensive re-lamping costs a thing of the past. Their benefits, however, go much further.

An Environmental Solution

Light pollution is greatly reduced with SafeSite® fixtures, which utilize the latest LED technology with proprietary optics designed to focus light directionally, so that it illuminates only required areas within the refinery, such as straight walkways, avoiding adjacent and upward light spill. Unlike conventional lights, Dialight's LED fixtures are designed to retrofit to multiple alternative fixings like walls or stanchions, and can also be used as side-by-side modules to expand an application. Some large conventional lighting users must carry a range of a few dozen types of fixtures to fit different locations, so using multi-purpose LED fixtures can drastically reduce the amount of inventory a facility must carry in order to maintain lighting in different situations. Use of LED lighting opens up access to many other benefits in hazardous location installations like this. One is excellent performance in low operating temperatures. Dialight's LED fixtures are rated down to -40°C and still provide 100 percent of their rated lumen output, unlike fluorescents as their output decreases rapidly at low temperatures. This makes LED fixtures ideal for use in extreme environments and exposed exterior installations.

Unlike HPS lights that can take minutes to warm up, LEDs achieve 100 percent light output from the second they are switched on. This instant-on ability can be significant in hazardous locations that use independent generators because these areas are more prone to blackouts and brownouts, resulting in the need for additional emergency lights. By fitting LEDs to a central battery or standby power system, expensive downtime and unnecessary exposure to danger can be avoided. Instant-on ability also creates more opportunities to save energy. LEDs can be coupled with occupancy sensors, and either completely switched off or reduced to a lower illumination level when no one is present around the installation. This not only reduces energy, but also dramatically extends the operating life of the lighting system. All in all, the replacement of traditional lighting with LED technology is delivering multiple benefits for this petroleum refinery, while additionally helping it maintain a strong environmental and safety focus in its operations.
More information is available at www.dialight.com.

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