

NEW LIGHTS FOR NEW HEIGHTS



By Danny Mulcahy

“LARGE” IS BEING REDEFINED WHEN IT COMES TO CONTAINER SHIPS. Compared to the 1970s, ships carry an average of four times more cargo. To accommodate these ships, crane heights have doubled in the last four decades. Container ship sizes continue to grow, and this trend is encouraging terminals to adapt in order to stay competitive. In North America alone, 70 ship-to-shore (STS) cranes are being raised in the next year to accommodate larger ships.

The timing of these projects also relates to the Panama Canal expansion, which is scheduled to be completed in 2015. The widening of the canal has heavily influenced world trade, especially for the Americas.

This fall APM Terminals at the Port of Los Angeles will raise 14 cranes by about 32 feet, and extend each boom by about 10 feet, to accommodate larger ships. Photo courtesy of APM Terminals.

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What's at Stake?

There are a lot of factors to consider when raising the height of an STS crane. Reassessing lighting specifications is one of them. It may sound like a small detail in the grand scheme of things, but ignoring it can have a major impact on operations.

Efficiency is vital. The better crane operators can see, the better they can do their jobs. Without proper lighting, it takes longer for the operator to see the twist locks and move the container. Over time, this can add up to a huge drop in productivity.

Most importantly, if lighting isn't suitable, inherent safety measures that terminals implement to protect their workers are compromised. When a West Coast port made the decision to raise its cranes 26 feet, the engineer contacted Phoenix, the lighting supplier, to reassess light levels. The crane required 10 percent more fixtures to deliver the same amount of light. Terminals increasing the height of their STS cranes even higher could lose up to 15 percent of their useable light.

Seize the Moment

Because raising the height of a crane will typically put it out of operation for one to four months, many terminals are using this opportunity to upgrade other parts. Making enhancements simultaneously can maximize this time and further prepare a terminal for future prosperity.

Retrofitting light fixtures has been a trend, and investing in LED technology while the crane is out of commission presents a great opportunity. LED lighting is quickly becoming an industry standard for port equipment. It is already standard for automated stacking cranes (ASC), and it won't be long before this extends to STS cranes.

Durability Reduces Maintenance

Many of the lighting challenges that ports and terminals face are results of the high-vibration nature of container handling equipment. Lighting related maintenance is a huge challenge for port operators.

Whether replacing an entire fixture or repairing a broken lamp or ballast,



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lighting maintenance on container handling equipment is time consuming, expensive and dangerous. Because LED lighting is solid-state technology, there are no fragile filaments or breakable glass. Quality LED's are also typically rated for 50,000 hours. For a fixture that is on twelve hours each day, that equates to over eleven years! The lifetime of traditional light sources is far less - between 5,000-10,000 hours.

This is a welcome change when the expense to replace a broken or burned-out lamp is considered. After accounting for the cost of the lamp, the labor, and the downtime, there is a significant price tag on each replacement.

Proper designed LED fixtures continue to prove that they will withstand the rigors of port applications while improper designs result in expensive failures. Phoenix Products Company installed its first LED fixture in 2009.

After five years, the same fixture is still installed and hasn't required any maintenance. Fixtures installed on STS cranes in the Port of Los Angeles in early 2012 remain untouched and maintenance free.

Responsible Use of Light

The introduction of LED technology has dramatically decreased the effect that lighting has on the environment as well as the comfort of operators. Efficient and responsible use of light is becoming a much higher priority as organizations all over the world are focusing on the sanctity of darkness where light has historically intruded.

Light pollution - Light pollution refers to wasted artificial light directed upward to the sky. It causes an otherwise dark sky, to be illuminated with unnecessary lighting from below. Light pollution disturbs wildlife, wastes

energy and obscures our view of the night sky. Organizations like the International Dark-Sky Association are increasing the industry's awareness of light pollution in an effort to "preserve the night". They have even instituted a certification program for manufacturers of lighting fixtures to minimize light pollution.

Light spill and light trespass - Light spill refers to light that is cast in unintended spaces. Outdated lighting technology and inefficient design are the biggest instigators of light spill. Light trespass is a more severe variety. It is a type of light spill characterized when the excessive light creates a nuisance. Imagine a street light that shines right into your bedroom at night. Not only does it cause an inconvenience, it wastes energy and resources.

Glare - Glare is another historic irritation in the lighting world. Glare is a visual sensation created by excess, uncontrolled brightness. It is a very important lighting design factor to consider, especially for outdoor applications. Glare can be characterized two ways - discomfort glare creates an annoyance or even pain for an operator, and disability glare creates an actual reduction in visibility. Either issue impairs the ability of a person to perform tasks and decreases productivity and safety.

LED Technology and Lighting Control - LED lighting technology allows for more control over the way light sources affect the surrounding environment with respect to light pollution, light spill and glare. By design, LEDs are much smaller light sources than traditional options. Each diode can be controlled through lensing to aim the light exactly where it is needed and eliminate light pollution, light spill and glare. This is the most prominent characteristic of LEDs that allow for control and energy waste reduction. It can decrease light pollution by up to 50 percent and energy waste by up to 70 percent.

Another control option that LED technology presents is dimming controls. A system can be installed that controls the light output from 0 to 100



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percent for certain areas that don't require full illumination all the time. Adjustments can easily be made for the time of day or night and the type of activity occurring in the illuminated area. The opportunities are endless when you have multiple light sources in one fixture.

Improved Light Quality

Positive operator feedback regarding LED light quality continues to pour in throughout the industry. In addition to the reduction in glare, LED fixtures provide greatly improved light quality and night visibility due to higher color rendering and increased uniformity when compared to many traditional lighting options. It was also reported that the safety vests of ground personnel are more visible in LED lights.

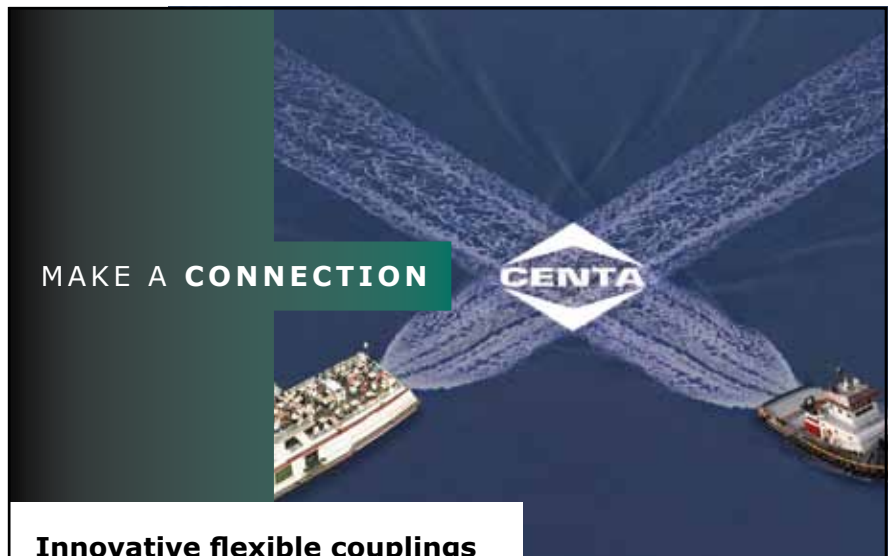
Under the amber glow of HPS fixtures, for example, colors become distorted and difficult to identify. A person can see fewer than 25 percent of colors accurately under HPS lights. By contrast, LED fixtures are usually purchased with a broader color spectrum, allowing color identification of more than 70 percent. These qualities will also improve the visual images captured by remote cameras.

Due to the light quality and the precise directional nature that is present with LED technology, traditional lighting fixtures can often be replaced with fewer comparable LED fixtures. In many of these installations, light levels were found to have increased at every measured point and even doubled in some areas, even with fewer fixtures. The highly defined optics of LED lighting have also been found to illuminate areas that were previously considered unreachable with traditional lighting options. Productivity and working conditions are improved while usable space is maximized.

As the industry moves to acceptance of LED lighting, it is time to begin maximizing the possible gains. There are countless advantages that terminals can start tapping into, and the rising heights of STS cranes present the perfect opportunity to explore them. **PMM**



Danny Mulcahy, who has 15 years of experience in sales and service in the North American port market, has been a member of the Phoenix Sales Team since October of 2012.



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