

# WASTE ISOLATION PILOT PLANT SAVES 97% ON ENERGY COSTS WITH INDUCTION LIGHTING RETROFIT

Case Study compiled and presented by James Hedin, WIPP Energy Control Project Manager

In 2002 the Department of Energy's (DOE) Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico replaced all the high-pressure sodium (HPS) bay lamps inside their water pump house with the latest technology induction lamps. Each fixture combines quality construction with the dependable long life of an induction lamp and ballast system rated at 100,000 hours of operation.

**Problem:** The original lighting design consisted of (18) 100-watt HPS fixtures kept in continuous operation due to the emergency related aspects of the building. Concerned with the re-strike / warm up period required with HPS lights, operations and emergency personnel departments were forced to compensate by maintaining a 24/7 light operation schedule to ensure that immediate access into the facility would not be impeded. This also caused the system's lighting components to prematurely reach design life early in the projected life of the building. Maintenance personnel were constantly required to troubleshoot the problem of intermittent lights being out in order to maintain proper lighting levels. Additional problems with elevated cooling requirements derived from the increased heat emitted from the existing fixtures.



**"The ideal lighting solution would minimize energy, operation and maintenance of the system while providing longevity."**

**Solution:** The fixtures were replaced on a one-for-one basis so that re-piping the system would not be required. This also minimized downtime for building access as well as the costs associated with piping. The new configuration allows for maintenance / changes (if any) to be performed on a single fixture basis without any lockout / tag-out requirements. Next, the toggle switches were replaced with time-controlled switches. This allows for quick switching and permits the duration of light operation to be adjusted to the individual user's need.

**The pinnacle of the solution** adopts the current technology of an induction lamp and ballast system combined with a clear acrylic refractor type lens and aluminum ballast housing manufactured by 1<sup>st</sup> Source Lighting in Auburn, Ca. The lamps yield an 80 CRI @ 4100 K equal to the quality of office lighting. The result is a uniform level of light throughout the space, providing a new look in an old room. The enhanced color rendering provides an additional level of safety into the area as the previous yellow hue is now replaced with distinct color. Information tags and labels are easier to read, which ensures appropriate decisions in emergency conditions.



While the before and after photos speak for themselves, the numbers behind the power and energy reductions need to be addressed to fully appreciate the upgrade:



- Annual energy savings is a staggering 97% (701kwh from 20442kwh), with the connected load essentially removed.
- The new induction lighting system is predicted to last the remaining life of the building, which would suggest a 100% reduction in future maintenance for parts and labor.

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