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Mining industry manufacturer switches from flooded lead acid batteries to NexSys® PURE Thin Plate Pure Lead (TPPL) technology

Case Summary

A mining industry manufacturer had been enduring high lift truck battery maintenance requirements and related operating costs. Following a power study from EnerSys®, the company started switching its lift truck fleet from flooded lead acid batteries to NexSys® PURE Thin Plate Pure Lead (TPPL) batteries. With this move to TPPL technology, the manufacturer is virtually eliminating the need for battery maintenance and is set to save up to approximately \$19,000 over the next five years.

Customer background and situation

Serving the mining and mineral processing industry worldwide, this Arizona-based manufacturer produces and distributes a well-known range of cyclones, slurry pumps and slurry valves.

The lift truck fleet supporting the company's manufacturing facility includes 28 vehicles – 25 electric and 3 internal combustion counterbalanced lift trucks – most of which operate in a high-temperature outdoor environment. The electric vehicles were being powered by flooded lead acid batteries, and the extreme temperatures were exacerbating their watering maintenance requirements. Excessive corrosion, spills and clean-ups, plus battery failures due to charging equalization issues, were also concerns.

The manufacturer sought an alternative battery solution that would address these issues and cut costs, even as it reduced the size of its battery fleet. The company's battery and charger dealer suggested that a power study conducted by EnerSys® could likely identify a lower-maintenance battery solution with a lower Total Cost of Ownership (TCO). The company's management agreed and had its operations team work with EnerSys® to collect the necessary operating data – see **Exhibit 1**.

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Application Information

- Shift details – one 10-hour shift
- Days per week – 5
- Weeks per year – 260+

Lift Truck Information

- Sitdown lift trucks
- Annual truck hours – 2,000
- Amp Hours (Ah) consumption per day – 400

EnSite™ Modeling Software Feasibility and Project Financial Report

EnerSys® entered the power study data into its EnSite™ modeling software. This proprietary program applies an end-user’s specific operating parameters and power requirements to generate reports that compare battery chemistries and identify the battery solution with the lowest TCO. EnSite™ software also provides a battery performance review that helps end-users define key operational challenges.

This particular assessment focused on 13 Class I vehicles. The review quantified several battery maintenance-related issues that were driving operating costs. First among them was that the company’s lift truck dealer was forced to water the batteries several times per week and conduct frequent washings and acid neutralizations; the annual costs for these tasks was more than \$18,000 (see **Exhibit 2**).

During the EnSite™ software assessment, the customer also revealed that excessive battery corrosion was causing the manufacturer’s Single Point Watering system to fail prematurely, requiring complete replacements every few years. Poor battery equalization charging practices were also contributing to shorter battery lifecycles and excessive battery replacement costs. These combined costs totaled \$12,480.00 (see “Additional Expenses ANNUAL/Base Case” in **Exhibit 2**).

After weighing all of the company’s operational variables and challenges, the EnSite™ software produced a Feasibility Report that recommended a switch from flooded lead acid batteries to NexSys® PURE TPPL batteries, which never require watering or long equalization charges. EnSite™ software also generated a Project Financial Report outlining a Return on Investment (ROI) timeline, plus annual and five-year savings – \$3,871.44 (see **Exhibit 2**).

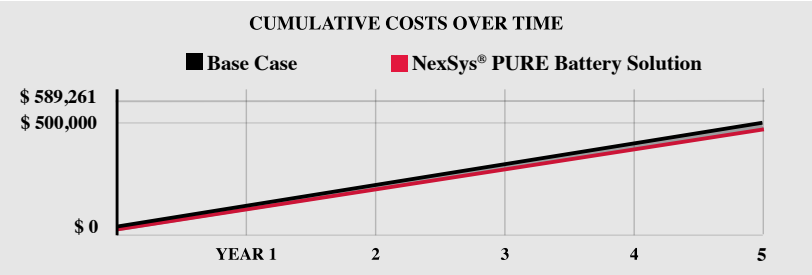
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Exhibit 2 Projected Return on Investment

	NexSys® PURE Battery Solution	Base Case	
Equipment Investment Summary ANNUAL	\$80,824.68	\$55,446.12	+ \$25,378.56
Fuel/Energy Expense ANNUAL	\$12,214.02	\$12,214.02	\$0.00
Maintenance Expense ANNUAL	\$1,300.00	\$18,070.00	- \$16,770.00
Additional Expenses* ANNUAL	\$0.00	\$12,480.00	- \$12,480.00

Total Annual Benefit	\$3,871.44
Timeline for ROI**	Immediate
Annual TCO Savings	3.94%
Projected Savings Over Five Years	\$19,357.20

*Additional expenses represent current operational expenses as identified and outlined by the customer represented in this case study and are not the responsibility of EnerSys®.
 **Savings apply solely to the customer represented in this case study. Immediate results are not guaranteed and subject to change. ROI results are based on specific customer provided data.



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TPPL Battery Implementation

Motivated by the financials and the prospect of no more battery watering, the company placed its initial order for 13 NexSys® PURE batteries and 13 NexSys®+ battery chargers. The lift truck dealer played a leading role in product delivery, installation, training and monitoring, helping to ensure that the operations team was following the proper operating and charging guidelines.

Since its first TPPL installations, the company has purchased four additional pairs of NexSys® batteries and chargers to power four new vehicles. As the battery lease terms for their remaining fleet vehicles expire, the company plans to keep replacing them with NexSys® PURE units.

Case Conclusion

The company's transition from flooded lead acid batteries to TPPL technology is eliminating battery watering requirements, the effects of corrosion, the risk of acid spills and the need for long equalization charges. Lift truck operators have expressed appreciation for the cleaner TPPL solution and management is pleased that the higher throughput of the NexSys® PURE batteries has enabled a reduction in their lift truck fleet size. According to battery operating data collected at the time of this writing, the TPPL solution is on course to deliver the savings projected by the EnSite™ software Feasibility and Project Financial Report – \$3,870 annually and \$19,360 over five years. Overall TCO savings are expected to increase as the company completes its transition to TPPL technology.