ED POGUE
Sales Manager, EnerSys

University boosts battery life in its floor care equipment with Thin Plate Pure Lead (TPPL) technology

Case Summary

Facing excessive premature battery losses in its floor care machines, a Michigan-based university needed a cost-effective sealed option to replace its calcium Absorbed Glass Mat (AGM) batteries. Based on a power study from EnerSys® plus an onsite demonstration, the university selected NexSys® PURE batteries. The Thin Plate Pure Lead (TPPL) batteries are on track to deliver at least triple the life of the AGM batteries and a savings of up to $3,600 over 3 years.

Customer background and situation

Serving more than 21,000 students, this university occupies a sprawling, 1,200-acre campus with about 150 buildings. Maintaining and cleaning those buildings is a fleet of roughly 50 vehicles comprised of burden carriers and 10+ stand on vacuum cleaners. The machines were outfitted with factory-spec calcium AGM batteries that were failing in as little as eight to ten months.

Attributing the high failure rate to their excessive use of the machines, the university's maintenance and operations team asked its floorcare equipment dealer about longer-lasting battery options. Because carpet cleaning was a key part of the application, flooded lead acid batteries – and their risk of carpet-destroying acid spills – were never an option.

Needing a sealed battery that would outlast the calcium AGMs, the university asked its dealer about Lithuim-ion (Li-ion) batteries, but the price was beyond their budget. Looking for additional options, the dealer looked to EnerSys®, who suggested that sealed NexSys® PURE batteries would provide a more affordable solution. The dealer agreed and started working with EnerSys® to prepare a power study that would help convince the university. The first step involved assessing the average annual power demands of two, 24-inch stand on vacuum cleaner. (see **Exhibit 1**).

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Application Information

- Shift details – two to three 8-hour shifts
- Days per week – 5
- Days per year – 260

Vaccum Information

- Annual vacuum hours – 500
- Amp hour (Ah) consumption per day – 60

EnSite™ Modeling Software Feasibility and Project Financial Report

EnerSys® processed the data with its proprietary EnSite™ modeling software. The EnSite™ software 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 Total Cost of Ownership (TCO). In this case, the software compared NexSys® PURE batteries to the calcium AGM batteries operating in the stand on vacuum cleaners over a three-year period.

The EnSite™ software also provides a battery performance review that helps end-users define and quantify operational challenges. The review indicated that the university's maintenance and operations team were not using the machines nearly as much as they thought. In fact, it was improper opportunity charging that was causing the premature battery failures – the team had been using the machines on multiple shifts for short amounts of time, then opportunity charging the batteries without completing the proper equalization charge cycles.

After weighing all of these variables, the EnSite™ software produced a feasibility report that outlined the financial benefits of switching to NexSys® PURE batteries. EnSite™ software also generated a project financial report outlining potential Return on Investment (ROI), plus annual and three-year savings (see **Exhibit 2**).

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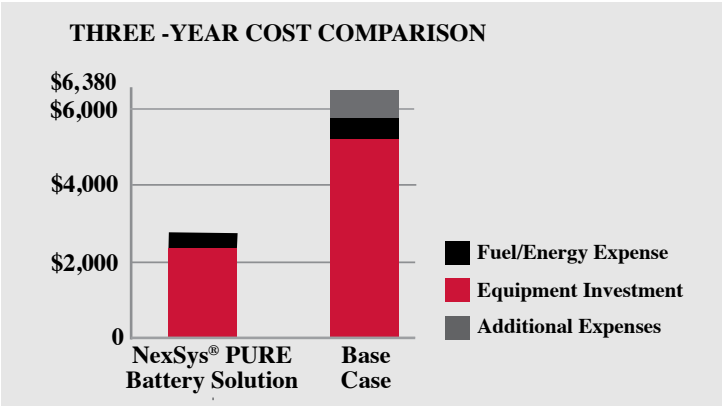
Exhibit 2 Projected Return on Investment

	NexSys® PURE Battery Solution	Base Case	
Equipment Investment Summary ANNUAL	$780.00	$1,800.00	**- $1,020.00**
Fuel/Energy Expense ANNUAL	$126.81	$126.81	**$0.00**
Maintenace Expense ANNUAL	$0.00	$0.00	**$0.00**
Additional Expenses* ANNUAL	$0.00	$199.92	**- $199.92**
Total Annual Benefit			**$1,219.92**
Timeline for ROI**			**Immediate**
Annual TCO Savings			**10.27%**
Projected Savings Over 10 Years			**$3,659.76**

*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

The EnSite™ modeling software predicted that the NexSys® PURE batteries would last for at least three years, in large part because TPPL technology is ideally suited to opportunity charging. The university team was impressed by the numbers but wanted to see how the batteries would perform in the application. In response, EnerSys® set-up an extended onsite demonstration, outfitting two floor care sweeper/scrubber units with NexSys® PURE batteries. After three months, EnerSys® presented the team with the battery operating data, which indicated that the NexSys® PURE batteries were on track to exceed three years of operation.

Convinced by the demo and the projected TCO savings, the university purchased the two NexSys® PURE batteries already in use in the demo plus four additional batteries. As with the start of the demo, EnerSys® trained the team on opportunity charging protocols. To help reinforce best practices, EnerSys® placed posters where the machines were stored that instructed operators to charge the batteries when the machines were not in use, and to charge them immediately whenever the Protection from Over-Discharge™ (POD) alarm sounded.

Case Conclusion

Thanks to its TPPL technology upgrade, the university is increasing equipment uptime and productivity while reducing battery maintenance and TCO across its buildings. To paraphrase the customer feedback, NexSys® PURE batteries are enabling the company to enjoy a lithium experience without the associated Li-ion price tag. The conversion to TPPL technology projects a cost savings of up to $11,000 for the university over a five-year period; multiplied across the 150 buildings for a total savings of up to $1 million.