GARRETT PUNDT
Technical Sales Representative, EnerSys

Sugar refinery cuts costs and boosts productivity by replacing gel lead acid batteries with NexSys® TPPL (Thin Plate Pure Lead) technology

Case Summary

A prominent sugar manufacturer was unhappy with the throughput and life expectancy of the gel lead acid batteries powering its Automatic Guided Vehicle (AGV) fleet. After reviewing the results of a power study conducted by EnerSys®, the company switched to NexSys® TPPL (Thin Plate Pure Lead) batteries. With the upgrade to TPPL technology, the company reported that it has slashed its Total Cost of Ownership (TCO) and is on track to save up to $65,000 over five years.

Customer background and situation

As a producer of several leading sugar brands, this West Coast-based company produces and distributes a range of sweeteners.

To help support that production, a fleet of 9 AGVs operate at the company's processing plant. The vehicles were being powered by sealed gel lead acid batteries, but with the fleet nearing the end of its lifecycle, the plant started investigating other sealed battery technology options, including Lithium-ion (Li-ion). The operations team appreciated that the gel batteries never needed watering but were also dissatisfied with their energy throughput and life expectancy of two to three years. Additionally, the gel batteries could not be opportunity-charged, and their long charge times were slowing production.

Looking for better battery options, the company looked to EnerSys® for help. Knowing that that the refinery was considering Li-ion batteries, EnerSys® presented a webinar on its NexSys® TPPL product, as it has a maintenance and charging footprint that is quite similar to Li-ion, but a price point that is considerably lower.

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To help make the case, EnerSys® next suggested the plant undergo a power study that would compare the costs and benefits of the NexSys® TPPL batteries versus the gel lead acid batteries. Plant management agreed, and its operations team worked with EnerSys® to provide the necessary information, including operating data captured by Wi-iQ® battery monitoring devices installed on each gel battery – **Exhibit 1**.

Exhibit 1 Power Study Details

Application Information

- Shift details – 2 10-hour shifts
- Days per week – 7
- Weeks per year – 52

Lift Truck Information

- Annual truck hours – 2,000
- Amp hour (Ah) consumption per day – 350

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 TCO. For this report, EnerSys® weighed the power requirements and costs of 9 AGVs.

After assessing the plant's operational variables and challenges, the EnSite™ software produced a Feasibility Report recommending a switch from flooded lead acid batteries to NexSys® TPPL (Thin Plate Pure Lead) batteries.

The report determined that NexSys® TPPL batteries would deliver a 160% throughput increase over the gel batteries – 1,056 Ah versus 480 Ah. The increased cyclability of the TPPL technology would also contribute to longer battery life expectancy, which in turn, would cut total operating costs. All related expenses and benefits were reflected in a Project Financial Report that outlined a potential Return on Investment (ROI), plus annual and five-year savings (see **Exhibit 2**).

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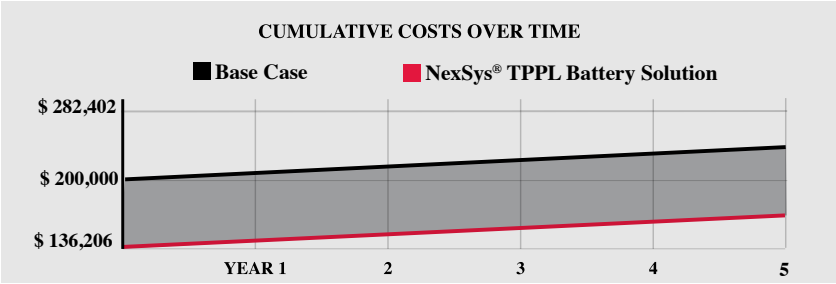
Exhibit 2 Projected Return on Investment

	NexSys® TPPL Battery Solution	Base Case	
Equipment Investment Summary ANNUAL	$27,240.84	$40,291.56	**- $13,050.72**
Fuel/Energy Expense ANNUAL	$5,975.81	$5,975.81	**$0.00**
Maintenace Expense ANNUAL	$0.00	$0.00	**$0.00**
Project Additional Expenses* ANNUAL	$750.00	$799.92	**- $49.92**
Total Annual Benefit			**$13,100.64**
Timeline for ROI**			**Immediate**
Annual TCO Savings			**27.8%**
Projected Savings Over Five Years			**$65,499.60**

* 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

Convinced by the EnSite™ modeling software numbers and benefits of TPPL technology, the plant placed an order for nine NexSys® TPPL battery units and 10 NexSys®+ chargers. EnerSys® worked with the plant's operations team to ensure that charger settings were properly programmed and trained operators on TPPL opportunity charging protocols, including the importance of frequent plug-ins.

Along with instruction on the recommended battery and charger maintenance, EnerSys® provided a complimentary Preventative Maintenance (PM) service visit after three months of operation. Once the operations team saw the value of data provided in the PM reports, they agreed to a semi-annual program for five years.

Case Conclusion

With its switch from gel lead acid batteries to TPPL technology, the plant is benefiting from a boost in productivity made possible by the higher throughput and opportunity charging capabilities of NexSys® TPPL batteries' – all for a significantly lower capital expenditure than Lithium-ion (Li-ion). At the time of this writing, battery operating data indicates that the TPPL solution is on track to outlast the gel lead acid batteries and potentially deliver up to 28% reduction in TCO and a projected savings of $65,500 savings over five years.