

New Opportunities for an Established Technology – The Rebirth of the Lead-Acid Battery in Green Tech



New Opportunities for an Established Technology - The Resurgence of the Lead-Acid Battery in the Green Energy Environment

American Energy Technologies Co. (AETC) is delighted to announce its collaboration with Apollo Energy Systems, Inc. (AES). AES has been a customer of AETC's graphite products for several years. AES has been developing, commercializing and manufacturing advanced lead-acid batteries for more than 20-years. Further improvements are expected with the use of new graphite-derived materials in the very near future. These improvements will incorporate some of the recently

discovered outstanding material and electrical properties of graphene. Recently, the two companies decided to extend their collaboration by launching a new and unique technology development / demonstration program which is open to existing and aspiring materials suppliers into the lead-acid battery industry. The objective of the program is to develop and demonstrate lightweight advanced lead-acid batteries with enhanced performance.

As part of this initiative, under the supervision of engineers and scientists of AES, AETC has installed a pilot assembly line for in-house manufacturing of fully functional prototype batteries rated for a variety of segments of the lead-acid battery market. The advanced battery designs are produced under the direction of Dr. Joe Gnanaraj, AETC's R&D Director Renewable Energy Systems. These improved batteries are expected to fill the growing market demand in start-stop applications, photovoltaic grid energy storage systems, Starting, Lighting, and Ignition (SLI), backup energy storage / Uninterrupted Power Supply (UPS), and electric vehicles. AETC is able to leverage its expertise in industrial graphite and carbon products to complement lead-acid battery platforms designed with improved performance in mind.

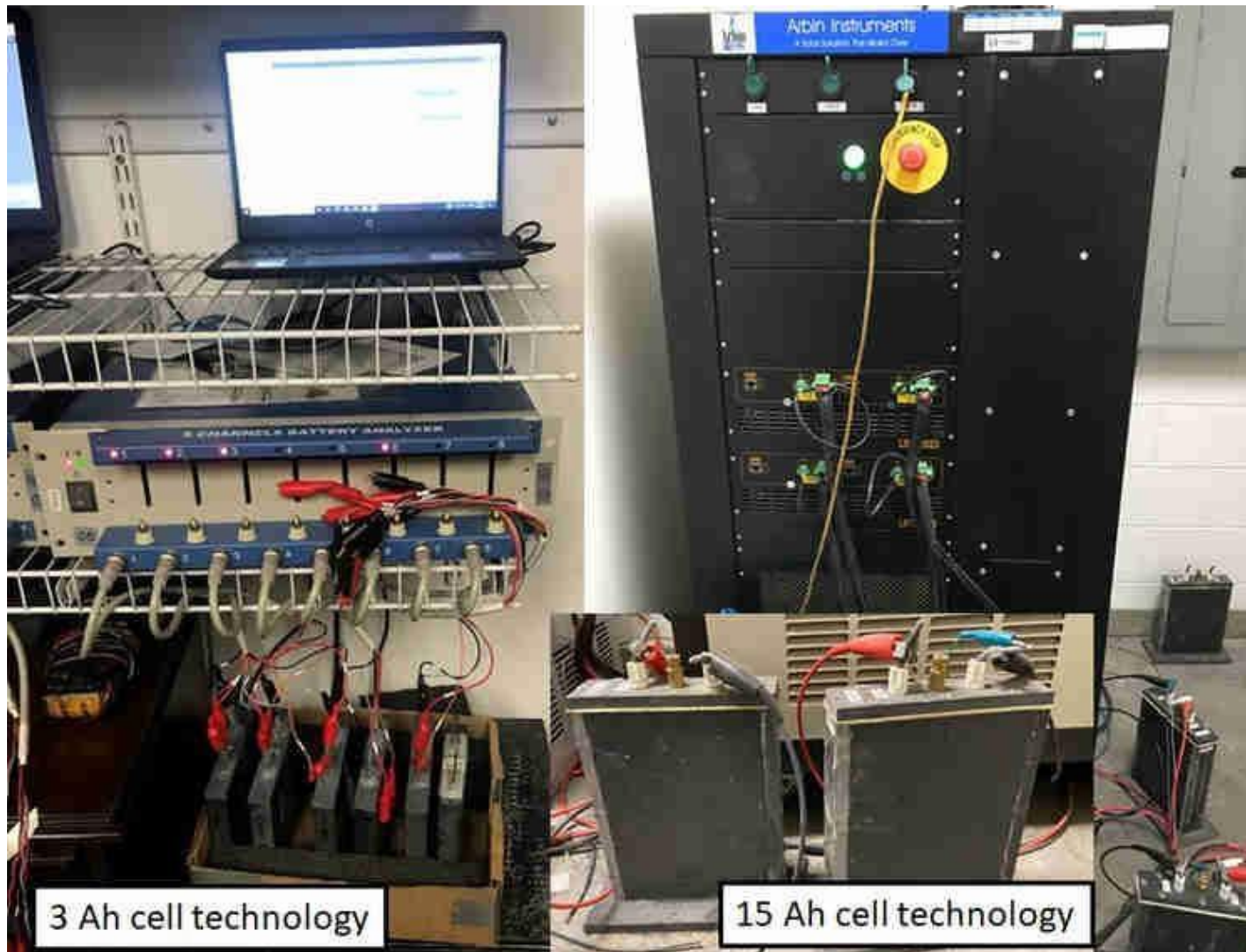
The collaboration between these two companies is not only limited to the prototype cell assembly and testing, but also extends its focus to various lead-acid battery cell component manufacturing, such as production of lead grids through advanced casting methods. Major opportunities exist in the optimization of pasted lead grids from the point of view of their weight reduction. This effort is expected to also enhance the capacity and lifetime of the batteries and improve their ability to accept and deliver high currents.

Also, a variety of carbon, graphite and graphene-based solutions for use in lead-acid battery electrodes are expected to complement emerging battery designs, effectively boosting their performance.

By means of this new AES-AETC Partnership, material suppliers into the lead-acid battery industry can now conduct meaningful and unbiased tests of their products in lead-acid battery prototypes prior to marketing to established battery manufacturers.

Dr. Barry Iseard, Vice President of AES commented: “AES and AETC collaborated since 2009. Besides participation in the commercial projects, AES joined AETC as a partner on a high profile US Department of Energy / National Nuclear Security Administration’s project aimed at developing processing technologies for recycling and reuse of spent batteries.

We are excited about unveiling a new joint project which establishes US industry’s only dedicated industrial R&D center for qualification testing of new materials for use in lead acid battery technology platforms ranging from classic cell designs to the advanced deep discharge & fast charge lead-acid batteries of the absorbent glass mat (AGM) valve regulated type. Lead acid batteries continue to maintain very strong position on the market, offering a number of tangible benefits to the end users over lithium-ion, nickel-metal hydride, nickel-iron and nickel-cadmium battery systems.



AETC's Unit C workstation testing capabilities for single electrode 3 Ampere-Hour cells and for 15 Ampere-hour deep discharge & fast charge lead-acid batteries of the absorbent glass mat (AGM) valve regulated type.

These benefits include guaranteed low cost, superb calendar and cycle life, proven low temperature performance, enhanced battery safety, maintenance-free, and existence of robust battery cell recycling infrastructure as well as extended manufacturing base with hundreds of active producers worldwide. Also, from a safety standpoint, lead-acid batteries do not suffer from the inflammability issues that plague lithium batteries.

Due to these factors lead acid batteries have been doing very well in the market and in recent years have seen remarkable performance improvements as a result of application of new and improved materials, many of which contain new forms of carbon.

We are combining the advanced carbon synthesis expertise of our partners at AETC with years of lead-acid battery manufacturing and R&D expertise of AES and launching a unique industrial R&D and test facility for new materials qualification. Battery assembly and testing will take place at the renowned AETC's Arlington Heights, IL Unit C industrial facility under the supervision of scientists and engineers from AES. We encourage interested parties to contact Apollo Energy Systems and American Energy Technologies Co. to have their materials tested in lead-acid battery technology platforms."