

## **The History of Exide Technologies**

The rich corporate history of Exide Technologies demonstrates its position as a forerunner of industrial advancement around the world. With countless contributions to the growth of technology, the company's story reflects the spirit of innovation at its best.

### **The Electric Storage Battery Company**

The evolution of what is now Exide Technologies began with creation of The Electric Storage Battery Company, founded in 1888 by W.W. Gibbs. As vice president of the United Gas Improvement Company, a Philadelphia gas lighting firm, Gibbs recognized that electricity had great potential as a source for lighting, and as such, posed a threat to gas. Gibbs formed the Electric Storage Battery Company to create a dependable mechanism for storing power so electric lighting companies could provide services to their customers if and when it was necessary.

Realizing that a better storage battery was a necessary first step, Gibbs purchased the ideas and patents of French inventor, Clement Payen, to transform good ideas about storage batteries (then widely referred to as "Pickled Amperes") into thoroughly reliable commercial products. With the development of the storage battery, or the "Chloride Accumulator," the Electric Storage Battery Company brought the electric lighting industry to a new level.

### **The "Chloride Accumulator"**

In 1890, the Electric Storage Battery Company installed the first practical storage battery at the Germantown Electric Lighting Company in Philadelphia. The battery furnished the lighting current, while a dynamo charged the battery. Soon after, the battery company received a request for 13,000 cells to power six new electric streetcars for the Lehigh Avenue Railway Company in Philadelphia. These streetcars became the first self-propelled vehicles to challenge the supremacy of the horse. Throughout the 1890s, the demand for storage batteries increased, forcing the Electric Storage Battery Company to move to larger facilities.

The possibilities for storage batteries continued to grow. The Pullman Company used Chloride Accumulators to light a few of its luxury railroad cars, and small batteries were sold to operate electric fans, sewing machines and phonographs. In 1898, batteries powered the first submarine in the U.S. Just before the turn of the century, Electric Storage Battery

Company batteries were used as power sources in electric locomotives, streetcars, passenger cars, surface boats and telephone exchanges, and for the nation's first automatic switching and signaling systems for railroads.

As the new century dawned, electric taxicabs first appeared in many large cities. They became so popular that The Electric Storage Battery Company developed a product of greater capacity and less weight especially for the "Ply-for-hire" trade. This new battery, introduced in 1900, was the first to bear the trade name "Exide," short for "Excellent Oxide."

### **Exide in Peace and War**

For more than 35 years, Chloride Accumulators enabled electric light and power companies to provide continuous service, while the alternating current systems that serve the public today were being developed and slowly extended. In 1901, the first successful transcontinental telephone service and the first transatlantic "wireless" telegraph transmission used Exide batteries. In the automotive industry, Exide pioneered two major developments concerning two entirely different uses of batteries.

The introduction of the electric carriage as a private passenger vehicle, primarily for town travel, heralded batteries as a means of replacing horsepower. The second development stemmed from a common health problem caused by cars at the time: motorists' broken arms. As a driver hand cranked his engine, the crank often swung back violently, injuring the driver's arm. Efforts to eliminate dangerous engine cranking led to the development of battery-started vehicles. The 1912, Cadillac became the first battery-started car with an internal combustion engine, produced under cooperative development between The Electric Storage Battery Company and Charles F. Kettering. The Exide battery also supplied power for lighting and ignition in this model. The functions of starting, lighting and ignition are the origin of today's battery industry term SLI, referring to automotive batteries.] In 1913, the U.S. Navy began experiments using Exide batteries to start the engines of hydroplanes and, in 1915, Exide batteries were used with the first starters installed on gasoline trucks. Use of the electric passenger car began to decline with invention of the electric starter. With the development of a radically different, heavy-duty battery, the Exide Ironclad, Exide opened up an entirely new field as a source of power. Exide batteries began to be used for the short-haul, frequent "stop and go" operations of electric handling trucks used throughout all of industry. These vehicles were the predecessors of today's delivery vans that might serve only a neighborhood or zip code. Exide Ironclad batteries also were used in electric fork

trucks and for the underwater operations of submarines. Over the years, Exide was a part of many major developments in exploration, communications and warfare. In 1934, an Exide deep-cycle battery was the sole source of electrical power when Commander Byrd established a military base on Antarctica. Exide batteries also provided power for Piccard's balloon flight and diesel locomotives that same year.

When the United States entered World War I, Exide engineers developed a lightweight, non-spillable battery to operate thousands of airplane radio sets. The company's batteries also powered many radio stations. In 1938, Exide acquired Grant Storage Battery Company, a move that expanded its product line into battery chargers and testers. Exide also contributed to the war effort of World War II when engineers developed a battery-powered wakeless torpedo.

### **New Dimensions, New Products**

In 1954, the company's lead-acid battery operations were split into two separate divisions - automotive and industrial, so the company could adequately service these different markets. Exide entered the dry-cell battery industry in 1957 when it acquired the Ray-O-Vac Company, then the country's second largest producer of dry-cell batteries.

The following year, Exide opened its Engineering and Development Center in Yardley, PA., as a corporate R&D facility. Exide went on to acquire the Wisconsin Battery Company of Racine, Wis. The renamed Wisco Company added motorcycle and specialty batteries to the growing Exide product line. In 1969, NASA's first lunar landing module used the stored energy of Exide's solar-recharged batteries. NASA took nickel-zinc Exide batteries to the moon on all of the Apollo space missions. During the gasoline crunch of the 1970s, Exide provided batteries for the small, fuel-efficient vehicles that were popular at the time. By 1987, with Exide's acquisition of General Battery Corporation, the company's product line became broad enough to fit nearly every vehicle on U.S. roads.

### **Modern Innovation and Expansion**

The 1980s and 1990s led to increased growth and development for Exide. In 1991 during Operation Desert Storm, Exide supplied starter and tank batteries for the U.S. Army. Exide continues to provide ordnance batteries for the Army today. In 1992, Exide once again demonstrated its powers of innovation with introduction of free electrolyte and gel marine batteries, climate-tailored batteries and maintenance-free technology.

In 1993, Exide initiated European expansion with development of an overseas battery division. In the United Kingdom, Euro-Exide began by acquiring BIG batteries and Gemala Ltd. In Spain, Exide purchased Tudor, and in France CEAC. By 1995, Exide achieved global reach and became the first battery manufacturer to launch a site on the World Wide Web. Robert A. Lutz, former president and vice chairman at Chrysler Corporation, was appointed Exide's Chairman of the Board in 1998. Lutz reorganized the worldwide management structure into Global Business Units and sold off non-battery units to allow the company to concentrate on its primary business. In 1999, Lutz heralded Exide as a high tech, innovative battery company with the introduction of the cylindrically-wound Exide Orbital technology, the most significant technology advancement in lead-acid batteries in 30 years. Exide launched the Orbital into the automotive and specialty markets with the Select Orbital auto battery, and the Orbital marine-starting and deep-cycle batteries.

### **The Acquisition of GNB Technologies**

In 2000, Exide acquired GNB Technologies, the global battery business of Australian-based Pacific Dunlop Limited. The acquisition allowed Exide to reenter the North American industrial battery business, broaden its geographic reach and attain significant efficiencies in its North American transportation business. GNB, a leader in the U.S. and Pacific Rim in manufacturing industrial and transportation batteries, supplied approximately 20 percent of the industrial batteries sold in North America for both motive and network power applications. GNB also was a leading North American supplier of automotive batteries for original equipment manufacturers and aftermarket retailers.

Like Exide, GNB had a rich and colorful history. Three partners – Bertram B. Down, Neil R. McLeod and Edgar A. Reed - founded a company April 9, 1906 in St. Paul, Minn. It was known as the Electric Manufacturing Company.

In that first year, twenty-three-year-old Lytton J. Shields joined the Electric Manufacturing Company and built an extensive regional network of dealers through which he sold Exide batteries, the leading name in batteries at the time. He was so successful that Exide decided to bypass him as distributor and open its own Twin Cities branch. Undaunted, Shields took on the Willard battery line and, through his network of dealers, firmly established the brand regionally. When Willard, too, decided to cut out the middleman, Shields once again was forced to change suppliers. This time, he took on the Philco product line; but again suffered from too much success. In 1916, when Philco notified him that it planned to begin selling direct, it became clear to Shields that if he was to have a future in the battery business, he

would have to manufacture his own batteries. Shields initiated action to begin casting grids and making plates, a production process that manufacturers guarded jealously. Thanks to the imagination and ingenuity of Carl Albrecht (who later became chief engineer), the team mastered the art of casting battery grids from molten lead. This gave them a foundation for their own company, called National Battery Company. The company sold its first glass container farm light battery in 1916 and its first automotive starting battery in 1918, under the National Battery brand name. By 1921, Shields realized he needed a national account - a company that would put its own name on his battery and sell it through established, well-accepted outlets. With this business strategy, Shields pioneered the marketing concept of private branding. His first customer was Montgomery Ward. On July 8, 1930, Shields purchased Gould Storage Battery Corporation of Depew, N.Y. With this acquisition, National Battery Company expanded its product line from just smaller, low-capacity automobile, farm lighting and radio batteries to include larger, high-capacity industrial batteries.

Gould supplied standby batteries for electric trolley lines, ocean liner lighting, electric elevators and even the communications wonder known as the "wireless". With much in common, Gould and National came together, pooling technologies, resources -- and names, inspiring the name Gould National Battery. In 1931, National acquired the Champion trademark with the purchase of Englert Manufacturing of Pittsburgh, PA. (Exide Technologies no longer uses the Champion brand).

With battery sales and demands running high, Gould-National diversified by acquiring companies that produced related products to strengthen its position in the automotive industry. During the next 20 years, Gould acquired more than 10 companies. By 1976, when Gould merged with I-T-E Imperial Corporation, it had its first billion-dollar year. In 1989, Gould-National Battery began export of Absolyte II batteries to Nippon Telegraph and Telephone (NTT) of Japan, becoming the first and only U.S. or European company to do so. A year later, the company opened GNB Japan, and in 1994, established GNB China in Hong Kong. GNB scored an award-winning accomplishment in 1996 when the company installed a Battery Energy Storage System (BESS) in the island community of Metlakatla, Alaska, in a partnership with General Electric. The BESS is an installation of lead-acid batteries that smoothes out the uneven hydroelectric current, saves money in energy costs and keeps the community from having to haul fuel oil in a precarious journey from the mainland over rough seas. In its first three years of operation, the BESS saved the local power company more than \$1 million. GNB Industrial Power received a prestigious national award for its work on the BESS project.

## **Exide Technologies Today**

Today, Exide Technologies (NASDAQ: XIDE) serves the complex stored energy needs of customers around the globe, providing services and systems that enhance vehicle performance and fleet utilization as well as those that reduce risk of temporary interruptions of power supplies. Key strengths of the Company are that its products and services span global markets and geographic borders, melding two significant bases of experience and technology expertise across its operations. This global footprint promotes better and faster means of introducing innovations in products and services, changing the way the world uses and stores electrical energy.

As a global leader, Exide has operations in more than 80 countries and has 33 manufacturing plants in 11 countries worldwide. Renowned brands including EXIDE®, GNB®, Sonnenschein®, and Absolyte® work to ensure the Company's leading position in global markets.

The Company's four global business groups – Transportation Americas, Transportation Europe and Rest of World, Industrial Energy Americas and Industrial Energy Europe and Rest of World – provide a comprehensive range of stored electrical energy products and services for motive power, network power and transportation applications. The Company's fiscal year 2010 net sales were approximately \$2.7 billion.

In November of 2009, Exide introduced ReStore Energy Systems, a new Company division dedicated to the development and pursuit of new markets for renewable energy storage and lithium ion energy systems. ReStore Energy Systems is a global division that utilizes proven technologies in lead-acid energy storage, along with recently acquired lithium ion technology, to develop new application-specific solutions for high-growth, global markets such as renewable energy. Technology- and application-specific collaboration with customers will be a focus of the new division.

The Global Research, Development and Engineering organization at Exide Technologies also is making critical strides and exploring some exciting new dimensions — developing new materials, products and processes to build a solid technology foundation and infrastructure for the future. The team is working on the advancement of multiple technologies — those that may enable breakthrough products or significant new product platforms — for implementation during the next two to five years.

The Company is making a significant investment in upgrading its laboratory and R&D equipment capabilities and continues to build its professional core of qualified engineers and scientists to join its new Product Development centers in Milton, Georgia; Büdingen, Germany; and Aurora, Illinois.

Exide Global RD&E efforts are directed at the utilization of technologies (inclusive of lead-acid) across applications, thereby seeking to maximize efficiencies and accelerate the global growth of new products across multiple product lines and businesses. Overall, the global organization has a strong focus on engineering and product development including those in emerging renewable energy (solar and wind turbines) with large storage applications, coupled with a strategic business fit concerning hybrid electric vehicles (HEVs).

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