THE LEAD ACID BATTERY-
OVER 100 YEARS OF SUCCESSFUL COMMERCE
Continuously Improving Technology Provided Power for Evolving Applications

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In all probability, the greatest influence on the use and the development of the Lead–Acid battery was the automobile SLI application. However, very important other uses required different technologies from the SLI product.

These other applications, such as energy storage, portable tools, lighting and emergency power, electric vehicles (including material handling), and non-automotive SLI, needed special developmental research. These special research needs continue to this day as new applications evolve.

A very important application, which has been discussed at societal meetings and special communication conferences, such as Intelec, is the use of lead acid batteries in the telecommunications field. Here, as the demands for communication power and energy have increased, the requirements for the batteries / cells have been substantially modified to provide greater safety standards and environmental compatibility.

The emphasis in this presentation is on standby backup power as used by the telephone companies and some of the developments needed to get to today's product. In the past, these developments involved the participation of the (what was then) The Bell System laboratories and Central Offices with the battery manufacturers / suppliers.

Prior to the 1950's, the Bell System purchased batteries from suppliers and then created documents which essentially described the purchased product. This was the Bell System's only control of the product. The problems which the System encountered were many, premature capacity loss, jar to cover leaks, post seal leaks, post corrosion, jar cracks and acid leakage, ground shorts, Stibine generation, explosions, excessive grid growth, fires and excessive watering. These faults did not inspire confidence in the product and also required a great deal of maintenance.

The need for reliable backup power required in the central offices of the telephone companies was the driving force behind many improvements. In the 50's and on through the 80's; such developments as Antimony and Arsenic free grids, see-through jars, leak proof jar-cover seal, leak proof post seals, predictable cell capacity loss with cell age and a predictable long life cell / battery. What was imagined was tested in the laboratory, tried in the field (central offices), modified, re-tested in the laboratory using new or modified testing methods, and re-introduced into the field.

In general the subjects to be covered in this paper touch on the improvements (described above) to the lead- acid system to make batteries reliable and consumer friendly.