

POWERING TELECOM

RURAL NETWORKS IN INDIA



A Reliable standby power solution for
Power Starved Sites in
Rural Telecom Networks



HBL Power Systems Limited



THE COMPANY

HBL Power Systems Ltd. is an acknowledged leader in the field of Specialised Batteries and DC power systems in India. The product focus is on Batteries and Electronics and the customer focus is on five major sectors;

- ◆ Telecommunication
- ◆ Aviation
- ◆ Defence
- ◆ Industry
- ◆ Railways

This focus gives the company an opportunity to meet diverse customer needs while its core competence is constantly upgraded to keep pace with the changing technology. HBL's products have been tested and approved by Independent testing agencies and customers worldwide.

HBL has established itself as the key provider of back-up energy storage in some of the most arduous operating environments in the world. Over 30 years of experience in Research and Development of specialised batteries has given HBL the ability to match the globally available technical knowledge to fulfill the special requirements of the battery users in India.



HBL IN TELECOM

HBL Power Systems is the largest supplier of VRLA batteries for various telecom applications in India and presently has over 50% share of the Indian Telecom Market. It has established an extensive service network through out the country, to cater to the service needs of the telecom sector and is fully prepared to meet its growing demands. The company has been keenly involved in developing new battery technologies suiting current telecom usage needs. With this back ground HBL is able to develop and offer *"The Tubular Gel Valve Regulated Lead Acid Battery which is an ideal solution to the present telecom requirement in the rural sector. The company is also exporting these batteries for telecom applications to many parts of the world."*

VALUED PARTNERS





TELECOMMUNICATION IN INDIA

India is the fastest growing telecom network in the world today and second largest in Asia. This sector has witnessed a phenomenal growth in the last decade and is likely to double in the next three years, to provide 500 million telephone connections across the country. With the huge expansion of mobile communications and the government's plans to provide connectivity to every nook and corner of the country, the growth of telecom network is now focused in rural locations. Over 30% of growth is expected to be in rural areas.

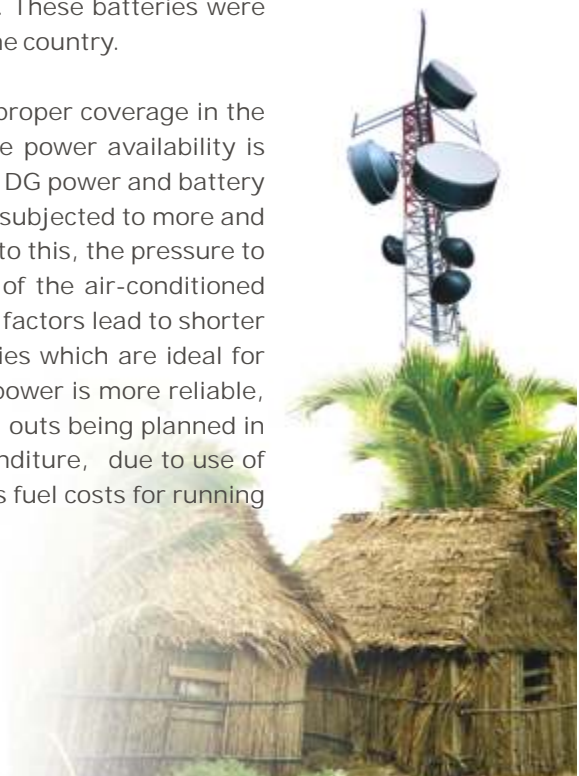
POWER BACK-UP FOR TELECOM NETWORKS

Conventional Lead acid batteries (Tubular flooded) were used to power Telecom Networks till the 90's. These batteries needed regular maintenance, separate battery rooms, occupied large spaces and were not environmental friendly.

In the 90's, the need to modernise telecom equipment in order to meet the growing demand, lead to the introduction of a superior battery technology and the Maintenance free Valve Regulated Lead Acid batteries were introduced in Indian telecom.

These batteries did not require water topping up , had easy installation procedures, required less space and were supplied in a ready to use condition. They did not give out any corrosive fumes, like their predecessors did, and could be moved in with the electronics in to controlled air-conditioned environments. This improved the service life of the battery. The VRLA (AGM) battery was expected to work under Float conditions and fitted the bill perfectly. These batteries were adopted for both fixed and wireless networks and are being used all over the country.

With the rapid expansion of the telecom sector and the need to provide proper coverage in the rural areas, more and more networks were installed in areas where the power availability is extremely poor. This meant that the networks were heavily dependent on DG power and battery back up. The batteries hitherto designed for float requirements are being subjected to more and more charge - discharge cycles, without enough time to recharge. Added to this, the pressure to reduce capital expenses on telecom equipment is forcing batteries out of the air-conditioned rooms to outdoor shelters, exposing them to higher temperatures. These factors lead to shorter battery life compared to urban installations. Hence, VRLA (AGM) batteries which are ideal for float applications and more suited in urban / metro regions, where grid power is more reliable, are no longer the best choice for the rural telephony. Further with the roll outs being planned in power starved areas the Telecom sector has to incur higher capital expenditure, due to use of larger capacity batteries and also increase operating expenditure towards fuel costs for running DG sets for longer durations.





TUBULAR GEL VRLA BATTERIES

The Solution to the Telecom Battery Dilemma in India

HBL introduces a maintenance free "Tubular VRLA battery, based on Gel technology". Its unbeatable combination of Tubular plate and Gelled electrolyte, is a perfect fit for Rural Telecom applications. These batteries conform to TEC Spec GR/BAT-03/01 March 2006. They also conform to IEC 60896 -2 and IEC 61427.

Valve Regulated

No water topping-up required during its lifetime & no special battery rooms required.

Tubular Positive Plates

Time tested for frequent cycling and deep cycling applications

Gelled Electrolyte

No stratification and failure due to operation in a partial state of charge. Good thermal Properties

No free acid

Safe and economical transportation

Antimony Free Alloy

Long shelf life with very low self-discharge

Filled and Charged

Ready to use, easier to install

Stackable

Space saving, cells can be mounted both in horizontal and vertical orientation

Tubular and Gel Combination

Very good deep discharge recovery



High Pressure Die-casted spine grids

Longer life





TELECOM BATTERY CONCERNS IN POWER STARVED AREAS

In telecom sites where power is not reliable, batteries are treated as a primary source of DC power rather than standby / back up power. As power failure in rural areas is frequent and of long durations, batteries are subjected to deep discharge and do not get sufficient time for recharging. This leads to operation of batteries in Partial State Of Charge condition (PSOC) which effects it's performance and life.

Hence Telecom networks operating in power starved rural sites need a battery, with Deep cycling capabilities, which can be operated under partial state of charge (PSOC) and have the ability to be recharged quickly. These batteries also have to be less sensitive to high temperatures. The challenge is to provide a battery with these features, without compromising the maintenance free requirements and other features, which had prompted the Telecom sector to switch over to VRLA batteries.

Categorisation of Telecom Sites in India

Power Starved Areas (PSA)	Battery Backup Required /day
Metro Cities / Non PSA	Up to 4 hrs
Urban Areas / PSA - 1	Up to 6 hrs
Semi Urban Areas / PSA - 2	Up to 8 hrs
Rural Areas / PSA - X	Up to 16 hrs

HBL's Recommendation for Batteries in Different PSA's

Location of Exchange	Battery recommended
Metro Cities	VRLA (AGM)
Urban Areas	VRLA (AGM)
Semi Urban	Tubular VRLA (Gel Technology)
Rural / Out door Areas	Tubular VRLA (Gel Technology)





Suitability of Lead Acid Battery Technologies for Power Starved Telecom Sites

Important Features	Tubular-GEL VRLA TEC - GR/BAT - 03/01 March 2006	VRLA - AGM (flat plate) TEC - GR/BAT - 01/03 March 2004	Tubular (flooded) IS 1651
Cycle Life	Excellent	Good	Excellent
Suitability for Deep Cycle Applications	Excellent	Average	Good
Cycling at "Partial State of Charge"	Excellent	Average	Good
Water top-up	Not Required	Not Required	Required
Low Temperature Operation	Good	Excellent	Average
High Temperature Operation	Excellent	Average	Excellent
Compatibility with Existing Chargers	Compatible	Compatible	Not Compatible
Space Requirement	Low	Low	High
Special Battery Rooms	Not Required	Not Required	Required
Battery installation procedure	Easy	Easy	Cumbersome
Special Transportation Requirements	Not Required	Not Required	Required

- Most Suitable for Power starved Telecom sites
- Moderately Suitable for Power starved Telecom sites
- Not Recommended for Power starved Telecom sites





Why Tubular VRLA Batteries with Gel Technology are the Best Choice for Power Starved Telecom sites

Tubular Plate Technology is best suited for cyclic applications. Apart from this advantage, Tubular Gel batteries do not stratify at all as electrolyte is in gel form

Over discharge in VRLA (AGM) and flooded batteries lead to a point from where it is impossible to recharge. Gel battery contains more electrolyte as compared to VRLA (AGM). Hence the battery always has some ions left to conduct charge current, resulting in excellent recovery from deep discharge.

Batteries, in most Rural Telecom sites, tend to spend a fair amount of time operating in partial state of charge (PSOC) leading to sulphation. This results in a permanent loss of capacity. Gel batteries, resist this type of failure mode exceptionally well.

VRLA designs are gas re-combinant type, hence no water top-up is required during its life time. In Tubular flooded batteries, water top up is required at periodic intervals.

At low temperatures (sub-zero) the electrolyte freezes in flooded batteries and effects the performance. VRLA (AGM) and Gel batteries resist freezing.

Tubular Gel & flooded batteries have good heat dissipation properties. VRLA (AGM) is a starved design, hence sensitive to high temperatures.

Existing chargers are constant potential chargers and are not recommended for charging tubular flooded batteries. However they can be used for charging Tubular gel batteries without compromising its performance.

Tubular Gel and VRLA (AGM) batteries can be stacked, resulting in space saving. As flooded batteries have to be kept vertically and cannot be stacked, they occupy more space.

VRLA (AGM) and Tubular Gel batteries work on gas recombination principal and do not give out corrosive fumes. Hence they can be placed in the same room with electronic equipment. Flooded batteries require special ventilation, acid resistant flooring and have to be installed in separate battery rooms.

Normally flooded batteries are supplied in dry condition and have to be filled and charged at site, where as VRLA batteries are supplied filled and charged, ready to use.

Electrolyte spillage may pose hazards in flooded batteries if transported in filled condition. In VRLA Batteries (AGM & Gel) special transportation is not required as electrolyte is immobilized.





Adoption of Tubular Gel VRLA Battery Technology in the Indian Telecommunication sector

- TEC has released new specifications for Tubular VRLA batteries based on Gel Technology. "TEC GR No. GR/BAT 03/01 Mar 2006".
- BSNL approved the procurement of 10% of their annual battery requirement, for Gel based Tubular VRLA batteries in rural telecom network.
- BSNL's has completed Type tests as per TEC specifications, and is convinced about its advantages .
- TEC has included Tubular VRLA batteries based on Gel technology in their battery monitoring guide lines No. GL/BAT-04/02 March 2007, issued by them.
- TEC has issued a white paper on evaluation of battery technologies for different types of battery technologies used in the Indian Telecom Network, in which it has clearly established that Tubular Gel VRLA Batteries are highly suitable for telecom Stand-by power backup.
- TEC has confirmed that the existing chargers are compatible with Tubular Gel VRLA batteries.
- Private telecom users have introduced Gel based Tubular VRLA batteries in Power starved telecom sites and outdoor sites across India.



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