M A G N E T
C O M M U N I C A T I O N S

NORTHSTAR - BLUE

TRIAL IN PAKISTAN WITH UNSTABLE GRID CONDITIONS



Pakistan Trials

- The past few years have seen an unprecedented power crisis and surge in price of crude based fuels
- This has led to hefty site management expenses; higher fuel costs, premature battery failure, high battery replacement costs, higher DG maintenance, and loss of business; frequent outages due to equipment failure.
- In light of these conditions North star Battery, the worlds leading telecom battery manufacturer has developed special, **one of a kind**, PSoC batteries; **5x faster recharge** than normal batteries, **no need to recharge to 100%** after every discharge
- After conducting trials with, A local GSM operator, the results have been phenomenal! **The projected savings on 2000 sites is USD 26 MILLION per annum!**
- As a result it is concluded that North Star BLUE batteries are suitable **for uPSOC environment**, have **fast charge** characteristics and can be used as an **efficient hybrid solution**.

CASE STUDY - 1

Problems Faced by the GSM operator:

- ❖High frequency of Power Outages.
- ❖Batteries unable to re-charge to 103% after each discharge.
- ❖Batteries failing in operation in 2-5 months.
- ❖Instances where sites went down.
- ❖Uncontrolled PSOC cycling.

GOAL:

- ❖Eliminate DG.
- ❖Make CP as the primary power source and BB as the secondary.
- ❖Avoid any Downtime.

Solution:

- ❖Use PSOC capable batteries.
- ❖Replaced existing batteries with North Star BLUE 100.
- ❖Use all the available recharge power to charge the batteries.
- ❖Boost Voltage and equalization configurations done at rectifier as per application manual
- ❖Install Data loggers to monitor and log BLUE performance.
- ❖Trial Commenced on 21st December 2012.
- ❖Logs Available from 4th January 2013.

SITE CONDITIONS

- Green Field Site.
- Sheltered.
- No DG available – DG eliminated from site.
- Batteries housed in Peltier cabinet and Temperature is not properly controlled.
- Site Maintenance not done regularly.

SITE PARAMTERS:

- Previous batteries- 8 strings of 24V*100 AH
- New batteries- North Star BLUE 8 strings of 24V*84 Ah
- Total Battery Capacity- 24V 672 Ah
- Rectifier Power Available 1200*6=7200 W
- Site Load= 2200 W
- Charging Power Available~ 5000 W (03*C10)





DATA LOGGER - REPORT

Type	CP - BB Only

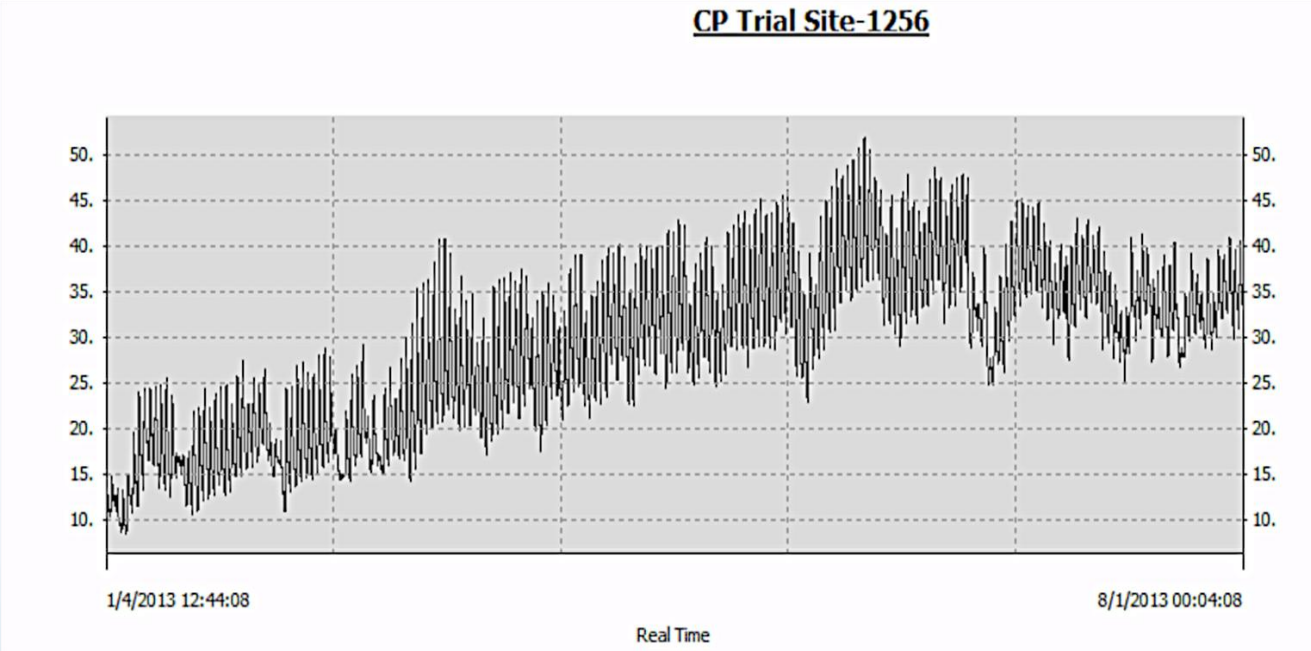
Batteries installed	Logger Installed
21-Dec-12	04-Jan-13

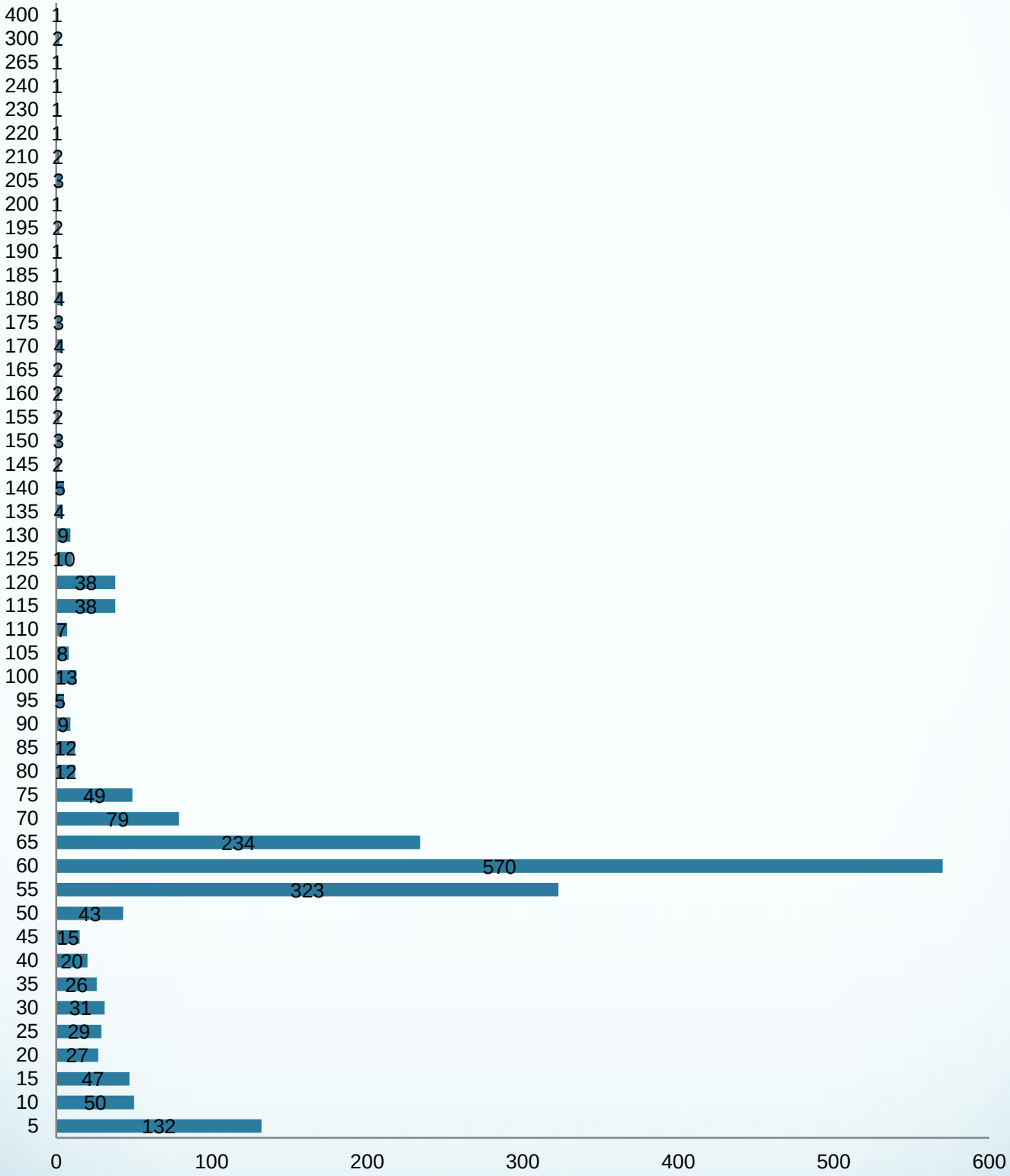
Report Period	Date	Time
From	4 Jan, 2013	12:44
To	31 July, 2013	23:59
Days	~ 208	

TOTAL NUMBER OF OUTAGES	1884
TOTAL BB RUN TIME (H)	1,854.35
TOTAL CP RUN TIME (H)	2,716.25

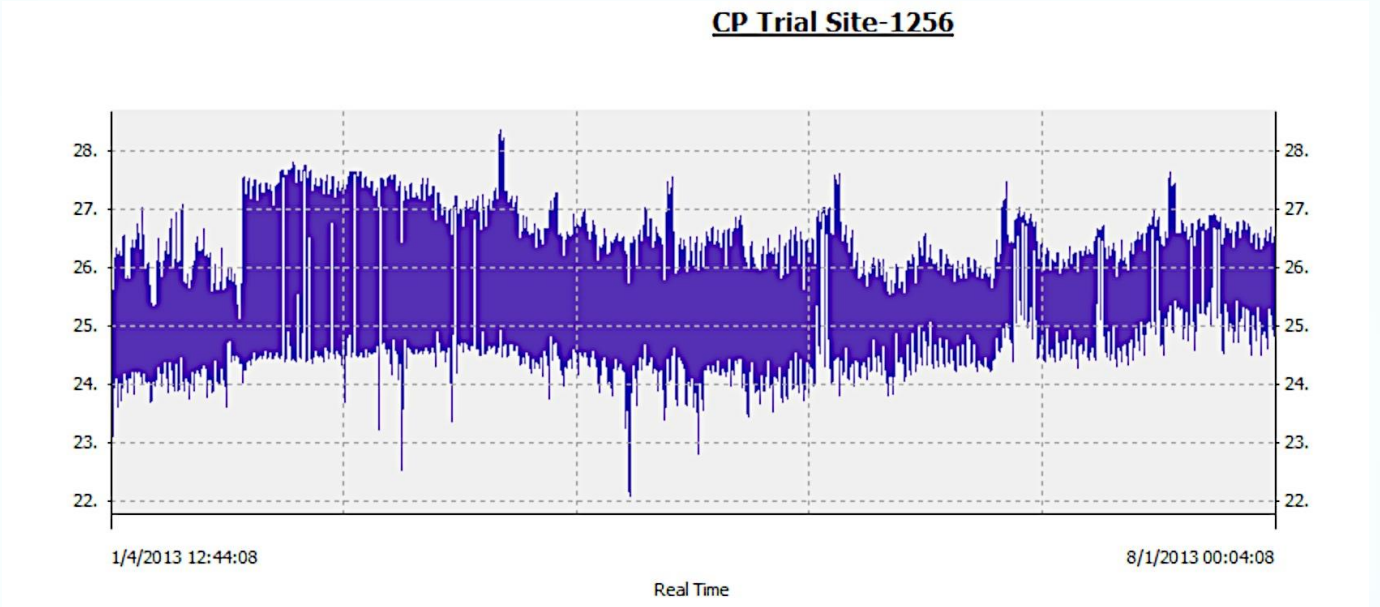
CP Unavailability-Power Shortage	40.6 %

Month	Jan'13	Feb '13	Mar '13	Apr '13	May '13	June '13	July '13
MAX. TEMPERATURE ('C)	27.4	29.9	40.8	43.4	52	48.6	43.1
MIN. TEMPERATURE ('C)	8.4	11	14.1	21.2	22.8	24.7	25
AVERAGE TEMPERATURE ('C)	16.5	18.8	26.1	31.6	37	36.3	33.8
CP Unavailability %	37.3	26.9	38.8	55.2	43.4	36.9	24.5





- Data Logger did not record outages less than 5 minutes
- CP Outages ranging between 5 minutes up to 400 minutes (6.7 HOURS)
- CP Outage duration is mostly between 50-75 minutes.
- 1 Hour outage frequency is 570.
- Classic case of uncontrolled PSOC environment.
- Overall Energy Shortage/C.P unavailability of about 40.60 %.



OUTCOMES:

- ❖DG eliminated from site.
- ❖Fuel savings up to **5563.05** Liters and **667,566** PKR have been achieved in **208** days.
- ❖Projected Yearly Fuel savings can be up to **1,171,450 PKR (11,714 USD) per site.**
- ❖Possible Fuel Savings for **2000 sites 23.42 Million USD**.
- ❖**No DG maintenance cost.**
- ❖**Minimized pilferage.**
- ❖BLUE battery has completed **1884 cycles** as documented and still going strong.
- ❖No down time experienced.
- ❖ROI: **4.1 months.**

CONCLUSION:

- ❖North Star BLUE battery is a PSOC capable battery
- ❖North Star BLUE does not need to be 100% recharged after every cycle.
- ❖North Star BLUE can handle unlimited charging current and can FAST charge.
- ❖North Star BLUE is a premium battery and instrumental in saving OPEX.
- ❖North Star BLUE is the need of the hour for telecom operators in unstable environments.

CASE STUDY - 2

Problems Faced by the GSM operator:
- ❖DG usage 24 hours.
- ❖High Fuel Costs.
- ❖High Maintenance.
- ❖High environmental impact.
- ❖High maintenance cost.
- ❖Pilferage

GOAL:
- ❖Reduce Maintenance costs and management.
- ❖Reduce Environmental impact.
- ❖Minimize DG usage.
- ❖Increase BB usage.
- ❖Optimize DG & BB run time.

Solution:
- ❖Reduce DG usage to 12 Hours per day.
- ❖Battery usage increased to 12 Hours per day,
- ❖Achieve optimized cycling of 1 hour BB – 1 hour DG or 2-2 hours toggle.
- ❖Use NSB BLUE to achieve efficient DG-BB hybrid solution.
- ❖Use hybrid controller to achieve toggling.
- ❖LVD also set to achieve toggle between DG and BB.





SITE CONDITIONS:

- ❖Roof Top.
- ❖DG Maintenance not done on time.
- ❖Poor site conditions over all.

SITE PARAMTERS:

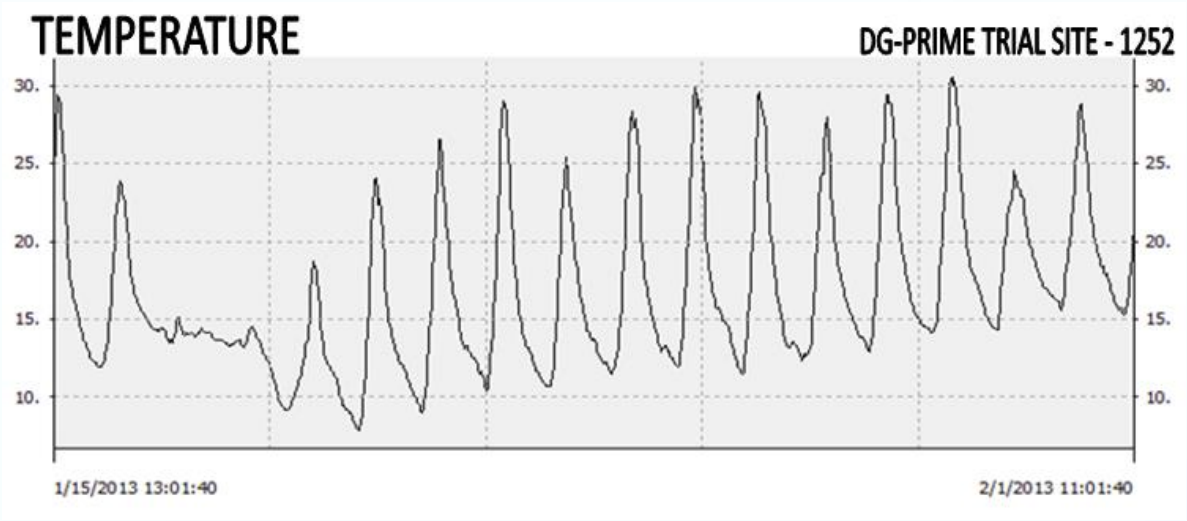
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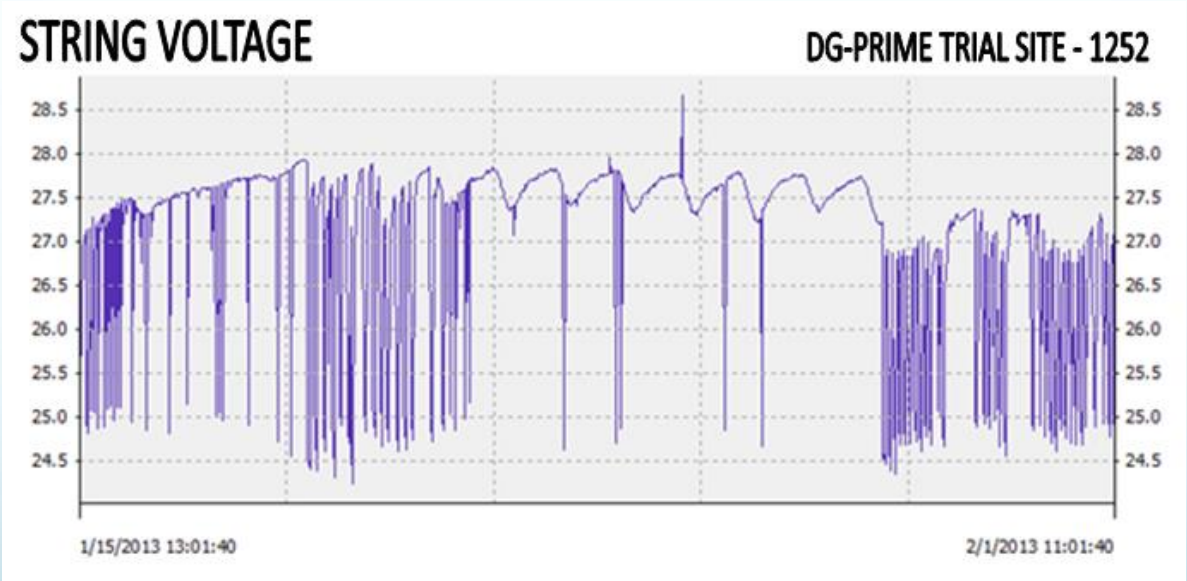


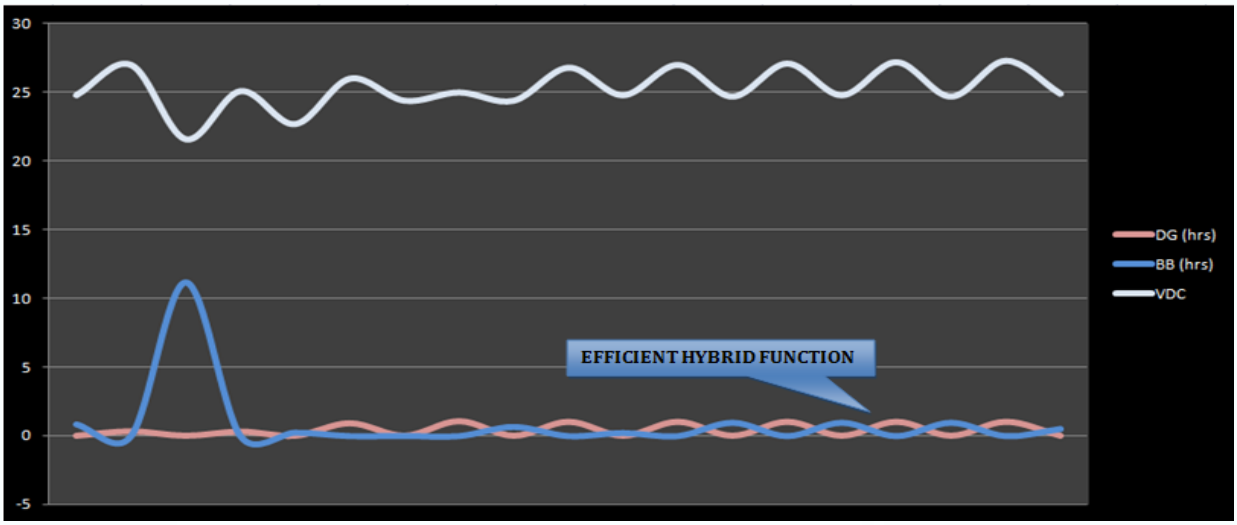


DATA LOGGER - REPORT

RUNTIME	TOTAL (HRS)	% (2 Months)
Battery Bank	613.59	41.56
Generator	863.43	58.5
Fuel Savings Using PSOC functionality (2 months)		220,892PKR
Projected Fuel Savings in 1 Year/ site		13,253 USD







OUTCOMES:

❖Batteries installed on 11th October, 2012.
❖Trial Duration 3 months.
❖Available Logs for 2 months.
❖Problems faced:
- ❖Hybrid controller switched off on several occasions.
- ❖Data Logger cut off after 3 months of operation.
- ❖DG maintenance delayed several times.
- ❖Refueling of DG delayed on several instances, resulting in draining batteries heavily.
- ❖Batteries were heavily discharged on several occasions and in cases up to 11.5 hours to break down the batteries but the site never went down.

❖DG run time reduced by **41.5%**.
❖**Fuel savings** up to **220,829 PKR** have been achieved in **60 days**.
❖Projected Yearly savings can be up to **1,320,000 PKR (13,200 USD) per site**.
❖Possible Fuel Savings for 2000 sites **26 Million USD**.
❖Minimized environmental impact.
❖Cut down DG maintenance costs.
❖Minimized pilferage.
❖**BLUE battery experienced deep discharges as well up to 11 hours but were able to recover well and fast charge to 100% in 3 Hours.**
❖No down time experienced.
❖ROI: .**3.63 months.**
❖Trial concluded and termed successful after 3 months but the batteries are still in operation after 9 months of commissioning.

CONCLUSION:

❖North Star BLUE battery is an efficient hybrid battery.
❖North Star BLUE can handle unlimited charging current and can FAST charge.
❖North Star BLUE is a premium battery and instrumental in saving OPEX.
❖North Star BLUE is the need of the hour for telecom operators facing high OPEX due to fuel costs and improve TCO's.