

المواصفات الفنية الخاصة بالمناقصة العامة

رقم (2015/19) الخاصة بشراء وتوريد

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المؤسسة العامة للاتصالات السلكية واللاسلكية

الإدارة العامة للمشتريات والمخازن

إدارة المشتريات - قسم العقود والمناقصات

Technical specification of the
" STATIONARY LEAD ACID- SEALD TYPE BATTERIES"

Battery Type : Cycling operation.
Group One: Battery Capacity (800 AH)

1 Scope:

This specification defines and covers the Technical requirements of the:
 single cell "Stationary -Lead Acid - Sealed Type Battery"

Complete with Battery Racks, Internal and external cell connectors,
 terminal lugs and Maintenance Accessories.

The Required Batteries shall power and feed the telecommunication equipments,
 And Will be Charged By The Photovoltaic Electric Power System.

The battery shall be designed for the cycling operation purposes.

The battery shall handle at least 1500 cycles for 80% DOD.

Electrolyte shall be from GEL type, which is better for cycling operation.

The Batteries should be single cell type (2 Vdc), (The container is only
 for one cell).

Quotations shall meet all requirements of this technical specification, unless,
 specific exception shall be clarify for each point by point.

Tenderer shall answer by compliance statements (Comply/Partially Comply/
 Not Copley) for each point of this specifications.

2 Application:

Under Normal Condition of work, The Photovoltaic Electric Power System
 supply the DC Power to the Telecommunication equipments- and charge
 the battery bank(s).

One Battery set (48 Vdc) are connected across the output terminal of the
 Photovoltaic Electric Power System to be charged during sun availability, and
 to feed the telecommunication equipments when the sun fails,
 During weak sun light, the Battery set should supply part of the current that load
 needed.

3 Environments:

The sites which the batteries required, are varies in altitude, temperature, and
 humidity.

So, the required batteries shall be designed and manufactured to be suitable
 for continuous operation at the following environments conditions:

Altitude: from sea level up to 2500 masl.

Temperature: from 0 centigrade up to 45 centigrade.

Humidity: Up to 90%.



4 Operation requirements:

The Batteries shall be suitable for the following operations:

- For daily discharged up to 50% of it's full capacity and charged up to full capacity.
- For deep discharged up to 100% of it's capacity when cloudy days, or system malfunctions, and fully charged after that.

The system voltage is -48 Vdc, the battery set shall consist of 24 cells 2Vdc/cell.

The Nominal battery's terminal voltage under floating conditions is - 52.8 Vdc/set, 2.2 Volts/cell.

The Boosting charge - after battery deep discharge- may goes up to 60 Vdc/set 2.5 Volts/cell.

The lowest battery set voltage (load disconnect) is - 43.2 Vdc/set, 1.8 Vdc/ cell.

The highest battery set voltage (Charging cut off) may goes up to 60 Vdc/set, 2.5 Volts/cell.

In actual operation, the discharge time may goes up to 48 hours

The battery set shall be suitable for daily cycling operation, and DOD cycling, Also, the battery set shall be suitable for prolonged float operation under varying conditions of charge and discharge.

5 Cell's (Battery's) General specifications:

The cell (battery) shall be designed and manufacturer for cycling operation, (daily charging and discharging), also for DOD cycling.

The battery container shall consist of one cell only,

The battery shall be sealed type - free maintenance, no attention needed during long period of operation,

Generally, there is no possibility of disconnecting the battery set from the system during it's life time.

The cell (battery) internal resistance shall be as minimum as possible.

The battery's self discharge should be as minimum as possible, less than 3% a month.

Cell (positive and negative) plates shall be designed and manufacture according to the newts technical methods, positive plate shall be tubular.

Plate connectors and posts shall be designed to contribute maximum effective surface area, maximum electrical conductivity, and superior voltage characteristic throughout battery service life.



6 Container and cover:

The cell container and cover shall be strong, rigid, high insulating quality, it should be high resistant to heat, shock and chemical attack. The cell cover shall be permanently sealed to the cell container, to make high resistant to leakage and explosions. The terminals and the inter-connecting links shall be of lead plate or better material. Cell terminal posts shall be heavy duty, manufacturing using lead alloy, or lead alloy reinforces with copper core inserts, and shall have adequate current carrying capacity for half battery life.

7 Mounting Arrangements:

The batteries shall not require any special arrangement for mounting, Normally, the cells (Batteries) are mounted in shelves and racks, Racks with vertical shelves shall be provided, for each set (24 cells). Racks shall be multi-layers vertically, to minimize the space of the battery. The tenderer shall provide complete rack specifications, material, components, and dimensions,

8 Warranty:

The supplier shall warrant that : the batteries are free of manufacturing and designing defect, If any failure due to manufacturing/designing defect is noticed within 18 months from the date of battery receipt at site, the supplier shall provide the same at his cost. The supplier shall warrant that: the batteries shall deliver at least 80% of the rated capacity of power for at least five years after the date of receipt at site when operated in accordance with the battery instructions.



9 Information to be furnished by the tenderer:

The tenderer shall provide the following information and technical data along with his offer:

- 1- The tenderer shall answer to the all technical points, by compliance statement: (Comply/Partially Comply/ Not Comply) Point by Point.
 - 2- The tenderer shall fill the attached technical tables by his technical data.
 - 3- Type and technique of the cell positive plates and negative plates, plates no., plate dimensions, and plates interconnection.
 - 4- Type and technique of the electrolyte, separator,
 - 5- Type of cell container, cover and internal pressure that container can stands.
 - 6- DC internal resistance of the battery, self discharge and battery storage conditions.
 - 7- Temperature effects on the performance of the battery.
 - 8- Charge and discharge characteristics and curves
 - 9- Estimated useful life in years in cycling operation, and in floating operation.
 - 10- Battery manufacturing international standers.
 - 11- Battery Positive and negative plates technique, materials, no. and dimensions.
 - 12- Cell (Battery) dimensions and weight.
 - 13- Manufacturer certificate (actual) of origin.
 - 14- list of the battery accessories and installation materials.
 - 15- The tenderer shall provide complete specification of the Battery set Rack, diagrams, dimensions, and type of materials.
- 15- The cell (battery), shall be delivered fully charged, and when arrived to PTC stores should give a capacity of no less than 90% of rated capacity.

10 Items to be supplied with the battery:

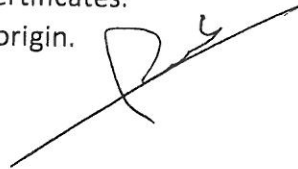
The battery racks should be provided according the BOQ,

One rack for one battery set(24 cells).

The battery shall be supplied with all cells interconnections accessories, and all other necessary acceories.

Tenderer shall provide complete set of documents, among of them:

- Battery technical document.
- Installation and drawing documents,
- Maintenance manual document,
- Battery factory test certificates.
- Battery certificate of origin.




**"Technical Table for:
"Lead Acid- Sealed Type- Cycling operation Battery"
SEALED TYPE**

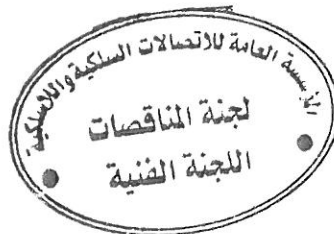
**Battery type : cycling operation.
Group One: Battery Capacity (800 AH)**

No.	Description	PTC Requirements	Tenderer Specifications
1	Brand Name of the Battery		
2	Model no. of the Battery		
3	Manufacturer Company		
4	Country of Origin		
5	Date of Manufacturing	The Year of delivery.	
6	Manufacturer Experience (years)	10 Years	
7	Tenderer Experience in Battery Trade	5 years	

8	Battery's manufacturing standers:		
9	Battery nominal voltage/cell	2 Volts/cell	
10	Battery floating voltage/cell	2.2 - 2.25 Volts/cell	
11	Battery Boosting charge voltage/cell	up to 2.5 Volts/cell	
12	Equalizing voltage/cell		
13	Maximum charge current		
14	Maximum discharge current		

15	positive plate material		
16	Positive plates type	tubular plate	
17	Positive plates no./cell		
18	Positive plates size mm		

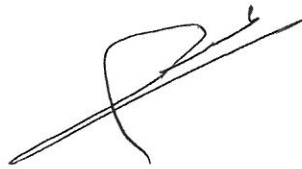
19	Negative plate material		
20	Negative plate type		
21	Negative plates no./cell		
22	Negative plate size mm		



23	Type of electrolyte		
24	Technique of electrolyte	Gel	
25	Battery Capacity AH C10	800 AH/ C10	

26	No. of Cycling life at 100% DOD.		
27	No. of Cycling life at 80% DOD.	1500 cycle	
28	No. of Cycling life at 60% DOD.		
29	No. of Cycling life at 50% DOD.		
30	No. of Cycling life at 30% DOD.		
31	No. of Cycling life at 20% DOD.		
32	No. of cycling life at 10% DOD.		
33	Estimated life (years) in floating opera.		

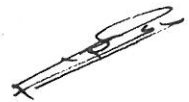
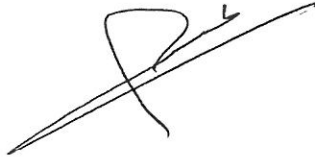
34	Internal resistance m Ohm.		
35	Self discharge % each month.	< 2% each month at 20 C.	
36	Battery size (w x l x h) mm		
37	Battery weight kg		
38	Battery set list of accessories	should be provided	
39	Rack's specifications and list of components	should be provid	





Basic criteria for Group One
Battery Type : Cycling operation Parameters.
Sealed type

- 1- Batteries shall be Heavy duty, high quality and industrial purposes.
- 2- Lead acid, tubular positive plate.
- 3- Single cell container with voltage 2 Volts/cell.
- 4- Designed for cycling and floating operations.
- 5- Minimum life time 1500 cycles for 80% DOD, and 15 years for floating.
- 6- GEL Electrolyte type.
- 7- Date of manufacturing should be the delivery year.
- 8- Battery design and manufacture should be according to Well known international standards, and should be specified.



Technical specification of the
" STATIONARY LEAD ACID- SEALD TYPE BATTERIES"
Battery Type : Cycling operation.
Group Two: Battery Capacity (600 AH)

1 Scope:

This specification defines and covers the Technical requirements of the:
 single cell "Stationary -Lead Acid - Sealed Type Battery"

Complete with Battery Racks, Internal and external cell connectors,
 terminal lugs and Maintenance Accessories.

The Required Batteries shall power and feed the telecommunication equipments,
 And Will be Charged By The Photovoltaic Electric Power System.

The battery shall be designed for the cycling operation purposes.

The battery shall handle at least 1500 cycles for 80% DOD.

Electrolyte shall be from GEL type, which is better for cycling operation.

The Batteries should be single cell type (2 Vdc), (The container is only
 for one cell).

Quotations shall meet all requirements of this technical specification, unless,
 specific exception shall be clarify for each point by point.

Tenderer shall answer by compliance statements (Comply/Partially Comply/
 Not Copley) for each point of this specifications.

2 Application:

Under Normal Condition of work, The Photovoltaic Electric Power System
 supply the DC Power to the Telecommunication equipments- and charge
 the battery bank(s).

One Battery set (48 Vdc) are connected across the output terminal of the
 Photovoltaic Electric Power System to be charged during sun availability, and
 to feed the telecommunication equipments when the sun fails,
 During weak sun light, the Battery set should supply part of the current that load
 needed.

3 Environments:

The sites which the batteries required, are varies in altitude, temperature, and
 humidity.

So, the required batteries shall be designed and manufactured to be suitable
 for continuous operation at the following environments conditions:

Altitude: from sea level up to 2500 masl.

Temperature: from 0 centigrade up to 45 centigrade.

Humidity: Up to 90%.




4 Operation requirements:

The Batteries shall be suitable for the following operations:

- For daily discharged up to 50% of it's full capacity and charged up to full capacity.
- For deep discharged up to 100% of it's capacity when cloudy days, or system malfunctions, and fully charged after that.

The system voltage is -48 Vdc, the battery set shall consist of 24 cells 2Vdc/cell.

The Nominal battery's terminal voltage under floating conditions is - 52.8 Vdc/set, 2.2 Volts/cell.

The Boosting charge - after battery deep discharge- may goes up to 60 Vdc/set 2.5 Volts/cell.

The lowest battery set voltage (load disconnect) is - 43.2 Vdc/set, 1.8 Vdc/ cell.

The highest battery set voltage (Charging cut off) may goes up to 60 Vdc/set, 2.5 Volts/cell.

In actual operation, the discharge time may goes up to 48 hours

The battery set shall be suitable for daily cycling operation, and DOD cycling, Also, the battery set shall be suitable for prolonged float operation under varying conditions of charge and discharge.

5 Cell's (Battery's) General specifications:

The cell (battery) shall be designed and manufacturer for cycling operation, (daily charging and discharging), also for DOD cycling.

The battery container shall consist of one cell only,

The battery shall be sealed type - free maintenance, no attention needed during long period of operation,

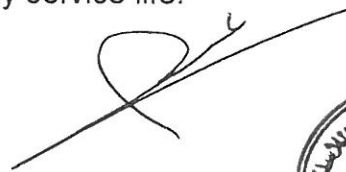
Generally, there is no possibility of disconnecting the battery set from the system during it's life time.

The cell (battery) internal resistance shall be as minimum as possible.

The battery's self discharge should be as minimum as possible, less than 3% a month.

Cell (positive and negative) plates shall be designed and manufacture according to the newts technical methods, positive plate shall be tubular.

Plate connectors and posts shall be designed to contribute maximum effective surface area, maximum electrical conductivity, and superior voltage characteristic throughout battery service life.





6 Container and cover:

The cell container and cover shall be strong, rigid, high insulating quality, it should be high resistant to heat, shock and chemical attack.

the cell cover shall be permanently sealed to the cell container, to make high resistant to leakage and explosions.

The terminals and the inter-connecting links shall be of lead plate or better material.

Cell terminal posts shall be heavy duty, manufacturing using lead alloy, or lead alloy reinforces with copper core inserts, and shall have adequate current carrying capacity for hall battery life.

7 Mounting Arrangements:

The batteries shall not require any special arrangement for mounting,

Normally, the cells (Batteries) are mounted in shelves and racks,

Racks with vertical shelves shall be provided, for each set (24 cells).

Racks shall be multi-layers vertically, to minimize the space of the battery.

The tenderer shall provide complete rack specifications, material, components, and dimensions,

8 Warranty:

The supplier shall warrant that : the batteries are free of manufacturing and designing defect,

If any failure due to manufacturing/designing defect is noticed within

18 months from the date of battery receipt at site, the supplier shall provide the same at his cost.

The supplier shall warrant that: the batteries shall deliver at least 80% of the rated capacity of power for at least five years after the date of receipt at site when operated in accordance with the battery instructions.

المؤسسة العامة للاتصالات السلكية واللاسلكية
لجنة المناقصات
اللجنة الفنية

9 Information to be furnished by the tenderer:

The tenderer shall provide the following information and technical data along with his offer:

- 1- The tenderer shall answer to the all technical points, by compliance statement: (Comply/Partially Comply/ Not Comply) Point by Point.
 - 2- The tenderer shall fill the attached technical tables by his technical data.
 - 3- Type and technique of the cell positive plates and negative plates, plates no., plate dimensions, and plates interconnection.
 - 4- Type and technique of the electrolyte, separator,
 - 5- Type of cell container, cover and internal pressure that container can stands.
 - 6- DC internal resistance of the battery, self discharge and battery storage conditions.
 - 7- Temperature effects on the performance of the battery.
 - 8- Charge and discharge characteristics and curves
 - 9- Estimated useful life in years in cycling operation, and in floating operation.
 - 10- Battery manufacturing international standers.
 - 11- Battery Positive and negative plates technique, materials, no. and dimensions.
 - 12- Cell (Battery) dimensions and weight.
 - 13- Manufacturer certificate (actual) of origin.
 - 14- list of the battery accessories and installation materials.
 - 15- The tenderer shall provide complete specification of the Battery set Rack, diagrams, dimensions, and type of materials.
- 16- The cell (battery), shall be delivered fully charged, and when arrived to PTC stores should give a capacity of no less than 90% of rated capacity.

10 Items to be supplied with the battery:

The battery racks should be provided according the BOQ,

One rack for one battery set(24 cells).

The battery shall be supplied with all cells interconnections accessories, and all other necessary acceoories.

Tenderer shall provide complete set of documents, among of them:

- Battery technical document.
- Installation and drawing documents,
- Maintenance manual document,
- Battery factory test certificates.
- Battery certificate of origin.





"Technical Table for:
"Lead Acid- Sealed Type- Cycling operation Battery"
SEALED TYPE

Battery type : cycling operation.
Group Two : Battery Capacity 600 AH

No.	Description	PTC Requirements	Tenderer Specifications
1	Brand Name of the Battery		
2	Model no. of the Battery		
3	Manufacturer Company		
4	Country of Origin		
5	Date of Manufacturing	The Year of delivery.	
6	Manufacturer Experience (years)	10 Years	
7	Tenderer Experience in Battery Trade	5 years	
8	Battery's manufacturing standards:		
9	Battery nominal voltage/cell	2 Volts/cell	
10	Battery floating voltage/cell	2.2 - 2.25 Volts/cell	
11	Battery Boosting charge voltage/cell	up to 2.5 Volts/cell	
12	Equalizing voltage/cell		
13	Maximum charge current		
14	Maximum discharge current		
15	positive plate material		
16	Positive plates type	tubular plate	
17	Positive plates no./cell		
18	Positive plates size mm		
19	Negative plate material		
20	Negative plate type		
21	Negative plates no./cell		
22	Negative plate size mm		



23	Type of electrolyte		
24	Technique of electrolyte	Gel	
25	Battery Capacity AH C10	600 AH/ C10	

26	No. of Cycling life at 100% DOD.		
27	No. of Cycling life at 80% DOD.	1500 cycle	
28	No. of Cycling life at 60% DOD.		
29	No. of Cycling life at 50% DOD.		
30	No. of Cycling life at 30% DOD.		
31	No. of Cycling life at 20% DOD.		
32	No. of cycling life at 10% DOD.		
33	Estimated life (years) in floating opera.		

34	Internal resistance m Ohm.		
35	Self discharge % each month.	< 2% each month at 20 C.	
36	Battery size (w x l x h) mm		
37	Battery weight kg		
38	Battery set list of accessories	should be provided	
39	Rack's specifications and list of components	should be provid	



Basic criteria for Group Two
Battery Type : Cycling operation Parameters.
Sealed type

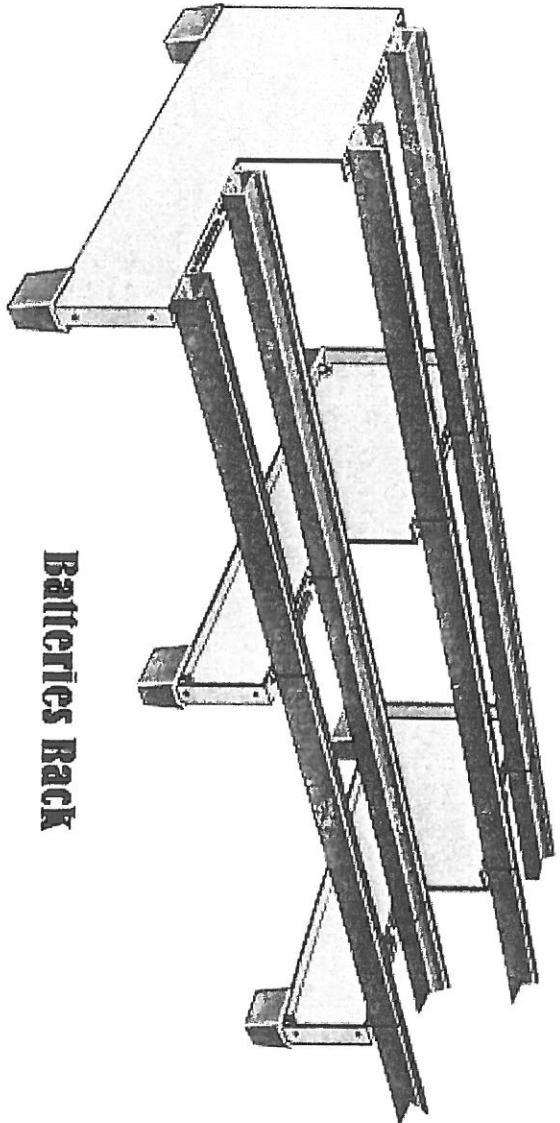
- 1- Batteries shall be Heavy duty, high quality and industrial purposes.
- 2- Lead acid, tubular positive plate.
- 3- Single cell container with voltage 2 Volts/cell.
- 4- Designed for cycling and floating operations.
- 5- Minimum life time 1500 cycles for 80% DOD, and 15 years for floating.
- 6- GEL Electrolyte type.
- 7- Date of manufacturing should be the delivery year.
- 8- Battery design and manufacture should be according to Well known international standards, and should be specified.



Tender no..... / 2015 List Of Material (B O Q).

No.	Item Description	Capacity	Unit	Qty	Unit Price DDP	Total Price DDP
Group 1 :						
	Stationary Lead Acid, Sealed Type Batteries Sets, 24 cells/set, 2v/ cell, 48V /set , 800 AH/C10, Complete with all installation materials (Cell's interconnecting, Bolts, Nuts, etc., (The List of Each Battery Set Installation Materials and Accessories Should be Provided with the offer). (Technical Specification Part 2).	800	Battery set (24 cells)	40 sets		
	Metal rack for each set, (Diagrams, dimension, list of the components for each set' rack should be provided with the offer)	For 800AH Battery set	Metal Rack	40		
Group 2:						
	Stationary Lead Acid, Sealed Type Batteries Sets, 24 cells/set, 2v/ cell, 48V /set , 600 AH/C10, Complete with all installation materials (Cell's interconnecting, Bolts, Nuts, etc., (The List of Each Battery Set Installation Materials and Accessories Should be Provided with the offer). (Technical Specification Part 2).	600	Battery set (24 cells)	25 sets		
	Metal rack for each set, (Diagrams, dimension, list of the components for each set' rack should be provided with the offer)	For 600 AH Battery set	Metal Rack	25		
Total Cost In US \$ For the Above materials DDP up to PTC Stores in Sana'a Including All Costs:						



Batteries Rack

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