

**SYRIAN ARAB REPUBLIC
MINISTRY OF ELECTRICITY
PUBLIC ESTABLISHMENT FOR TRANSMISSION AND
DISTRIBUTION OF ELECTRICITY (PETDE)**

**TENDER DOCUMENTS
AND
TECHNICAL SPECIFICATIONS
For
Nickel-Cadmium Batteries**

Prepared

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1- Introduction

DC Power System shall be supplied by battery and battery charger , the battery charger input voltage will be 3ph 380/220 VAC coming from substation AC system.

The battery & chargers will be used in our electrical network (400/230kV, 230/66 kV & 66/20 kV) substations.

The general AC supply is used to supply a rectifier in order to store energy in a battery to be used during a power cut. This supply is a pure quality DC which is immune to defect on the incoming AC supply.

The battery-chargers(**automatic constant voltage**) shall be designed for charging and maintaining the charge of Nickel-Cadmium batteries in parallel operation with a variable load. The following modes of operation shall be provided with all accessories:

- 1- Float Charge Operation:
- 2- Equalizing Charge Operation:
- 3- Boost charge operation

2- Batteries

Some Sets of Batteries shall be 220 VDC (200 ,) AH & others 110 VDC (200AH) nickel-cadmium of the pocket or sintered plate . with (potassium hydroxide & lithium hydroxide) electrolyte , open, or semi-sealed type, housed in totally enclosed translucent plastic containers. Each cell shall be provided with a vent cap/electrolyte filler plug and a pressure operated gas release valve designed for intermittent operation.

Cells shall be **L-range** (low discharge type) **Polypropylene** formed into a sub-assembly by mounting in groups, in robust containers. Taping together of cells will not be accepted .

Cells plastic containers shall be constructed so that the plates are rigidly held so as to avoid the possibility of distortion and short circuiting of the plates.

The battery shall be suitable for float and boost charging and capable of providing the guaranteed output throughout the range of ambient conditions specified.

The cells shall be arranged in tiers on stainless steel stands and spaced so as to permit sufficient access to all cells to allow topping up of electrolyte. Cells shall be numbered consecutively and terminal cells marked to indicate polarity.

Cells shall be permanently marked with the following information:

- Manufacturer's reference number and code
- Year and month of manufacture
- Voltage and nominal capacity at the 5 hour discharge rate.

All battery stands shall be suitably protected against corrosion and attack by the battery electrolyte.

Intercell connections shall be of low resistance, in a clean condition when bolted and protected against corrosion.

The lowest rack for accommodating battery cells shall be a minimum of 15 cm above ground level.

Sufficient electrolyte shall be provided to permit the first filling of each cell, and for topping up during commissioning.

The contractor should present the following spare parts and tools:

- /30/ cells with the sufficient electrolyte.
- Gloves. (N^o /1/ pair for each set)
- Density meter. . (N^o /1/ meter for each set)
- Temperature meter. . (N^o /1/ meter for each set)
- Any other necessary tools needed for erection and maintenance the battery set.

As per attached schedule of contract.

Battery set should be protected by suitable Fuse box with signaling and provide with power cable for (15-20) m distance .

The float voltage of the battery shall be the optimum required to ensure the maximum possible period between topping up with electrolyte, without the

need for supplementary charging to restore the battery to its fully charged condition. It shall not exceed the maximum voltage rating of the equipment being supplied.

At the end of the rated discharge period the voltage available at the terminals of the equipment being controlled shall not be less than the minimum operating voltage (185V for 220 system & 93V for 110 system) The discharge capacity of the power supplies battery shall be sufficient to supply the loads during the discharge period.

Each battery installation shall be provided with electrolyte and a durable instruction card with a full set of test accessories mounted in a strong wooden box. One syringe hydrometer shall be included for each battery installation Suitable containers shall be provided for making up electrolyte

- The bidder must fill in the attached technical tables with all the information required from the manufacturer according to the specifications of the batteries provided
- All technical information for batteries from the manufacturer should be submitted .
- Manufacturer ISO9001&IEC60623 test report should be submitted for battery type offered
- The contractor shall bear the expenses of attending the following routine test in the manufacturer's country:
 - 1- Sampling method and Quantity.
 - 2- Battery Appearance inspection.
 - 3- Open circuit voltage Detection .
 - 4- Battery capacity detection.
 - 5- Detection of Battery internal resistance.
 - 6- Battery self-discharge Detection.
 - 7- Battery overcharge test.

3- **Required Documents:**

All following Technical information should be submitted to PETDE:

- 1- The Catalog and manual of batteries .
- 2- Layout of battery arrangement.