

PRASAR BHARATI
(Broadcasting Corporation of India)
OFFICE OF THE ADDITIONAL DIRECTOR GENERAL (SOUTH ZONE)
ALL INDIA RADIO & DOORDARSHAN
Swamy Sivananda Salai, Chennai - 600 005

NO. ADG (E) (SZ) /PUR/83/PSEA/2011-12/

Date:- 28.12.2011

SUB: SITC FOR on line 30 kVA UPS with Isolation Transformer & 30 minutes Backup
.- 3Nos at AIR Chithradurga,Kothagudem and Mehaboob nagar (1 Each)

Sir,

Kindly find enclosed the tender enquiry for the Supply, Installation, Testing and Commissioning (SITC) of on line 30 kVA UPS with Isolation Transformer & 30 minutes Backup.- 3Nos at AIR Chithradurga,Kothagudem and Mehaboob nagar (1 Each)

Tender documents can be downloaded from the following web sites on free of cost:

www.cesairdd.org.in/tenders.html

www.allindiaradio.org/tender.html

www.tenders.gov.in.

The tenders will be received at the Office of The ADG(E) (SZ),
AIR & DD, Swamy Sivananda Salai, Chennai-5, up to **1230** Hrs on
18.01.2012. The technical bid and E.M.D. will be opened on the same day at
1500 Hrs. The commercial bid will be notified after recommendation of
technical committee.

Yours faithfully,

(M.SUJATHA)
Assistant Engineer
for ADG (E) (SZ)

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NO. ADG(E) (SZ)/PUR/83/PSEA/2011-12/

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SUB: SITC FOR on line 30 kvA UPS with Isolation Transformer & 30 minutes Backup.- 3Nos at AIR Chithradurga,Kothagudem and Mehaboob nagar (1 Each)

1. DESCRIPTION:-

SEALED TENDERS ARE HEREBY INVITED FOR AND ON BEHALF OF THE PRESIDENT OF INDIA, FROM REPUTED FIRMS FOR THE SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF on line 30 kvA UPS with Isolation Transformer & 30 minutes Backup.- 3Nos at AIR Chithradurga,Kothagudem and Mehaboob nagar (1 Each)

2. The tender shall consists of three parts (bids) namely:

(a) **EMD:-** Earnest Money amounting **Rs.30,000/-** (Rupees Thirty Thousand Only) in the form of Demand Draft on Nationalized Bank drawn in favor of ADG(E) (SZ), AIR & DD, Chennai-5/Bank Guarantee should accompany the tender'. Tenders without EMD shall be summarily rejected and their technical cum commercial bid will not be opened at the time of tender opening. (However exemption for payment of EMD will be considered to the firms who has registered with NSIC)

(b) **TECHNICAL BID:**

Technical bid should contain the confirmation to the enclosed technical specifications. This should be submitted in a separate sealed envelope with "TECHNICAL BID" written on it.

(c) **COMMERCIAL BID:**

The commercial bid should contain the price bid and acceptance of the commercial terms and conditions of this tender document. The price should be quoted for free delivery of materials at respective destinations. This should be submitted in a separate sealed envelope with "COMMERCIAL BID" written on the envelope.

The tenders will be submitted in sealed envelopes with the name of work, date of opening and the bid enclosed written on the envelopes.

The above mentioned envelopes should be enclosed and submitted in another large size envelope duly sealed and superscribed with "SITC for on line 30 kvA UPS with Isolation Transformer & 30 minutes Backup.- 3Nos at AIR Chithradurga,Kothagudem and Mehaboob nagar (1 Each)and date of opening. The envelope will be received at this office of The Additional Director General (E) (SZ), AIR & DD, Swamy Sivananda Salai, Chennai-5 up to 1230 hrs. on 18.01.2012. The technical bid and E.M.D. will be opened on the same day at 1500 hrs. The commercial bid will be notified after recommendation of technical committee.

In case tender opening date falls on a holiday, the bids will be received and opened at the same specified time on next working day. Bids received late

or submitted after the scheduled specified time on scheduled date will not be entertained and will be returned back unopened.

3. Tenderer should quote for all the required items. Partial tenders will be rejected.

4. VALIDITY:- The tender shall be kept valid for three months **(90 days)** from the date of opening.

5. PRICES:- The prices quoted should be firm and for free delivery at site inclusive of transit insurance, excise duty and entry tax and other tax if any should be quoted separately. Tenderers should quote in figures as well as in words the amounts tendered by them. In the case of illiterates, the rates or the amounts tendered should be attested by a witness. Breakup of prices for individual/ whole units should be specified wherever possible instead of bunching all units together. Similarly supply price and works price (Like installation, testing, Commissioning) should be quoted separately.

6. DUTIES AND TAXES:-

(a) EXCISE DUTY:- The prices should contain an element of Excise Duty which should be indicated separately. Any statutory variation in the Excise Duty taking place after acceptance of tender within the delivery date will be adjusted by the purchaser on Production of documentary proof.

(b) SALES TAX / VAT:- The prices should be exclusive of ST/CST/VAT. The prevailing rate of ST/CST/VAT should be clearly mentioned in the tender.. The following certificates are to be submitted by the supplier along with the bills.

"Certified that the goods on which the sales tax has been charged have not been exempted under central sales tax act of the rules made thereunder. The amount charged on account of Sales Tax/VAT on these goods is not more than what is payable under provision of the relevant act or the rules made thereunder".

"Certified that we are registered as dealers in the State under registration No. for the purpose of Sales Tax. Any Statutory variation in ST/VAT taking place after acceptance of tender within the delivery date will be adjusted by the purchaser. For this purpose, Government order should be produced".

(c) WORKS CONTRACT:- If work contract tax is leviable by the concerned State Government on works contracts, the same shall be clearly mentioned in the Tender. The contractor should furnish the service tax number in the quotation.

7. TERMS OF DELIVERY:- F.O.R. Destination.

8. DELIVERY PERIOD:- Tenderer may note that the entire work shall be completed within **50 days** from the date of the work order. The lay out wirings and other drawings wherever applicable shall be got approved within 10 days from the date of Work order.

EMD of all but the last three tenderer will be returned back within 10 days opening of tenders. EMD of the remaining two tenderer other than that of the successful tenderer will be returned after finalising the contract. EMD of the successful tenderer will be returned after expiry of Guarantee period.

9. IT CLEARANCE CERTIFICATE:- Income tax clearance certificate shall be submitted along with the tender, without which the tender is liable to be rejected.

10. EXPERIENCE: The tenderer should give documentary proof for having successfully designed. Fabricated, installed and commissioned similar type of equipment/work. They should also submit list of works which are in hand at the time of submission of tender. The list shall contain the name of work, cost of work and present position of work.

11. AFTER SALES SERVICE:- The Tenderer should give full details of after sales service capability. The locations of service centers across the country shall be indicated. If there is no service centers at/ near the location of the site the tender is likely to be rejected.

12. TECHNICAL SPECIFICATION AND GENERAL TERMS AND CONDITIONS:-
For technical specification for other general terms and conditions see the Annexures. The tenderer should submit necessary pamphlets description of items being offered along with technical bid and also the firms to which similar items were supplied in the near past and completion report.

13. ACCEPTANCE/REJECTION OF TENDER:- The acceptance of a tender will rest with the ADG(E) (South Zone), AIR & TV, Chennai-5 who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all of the tenders received without assigning any reason.

14. GENERAL:- Canvassing in connection with tender is strictly prohibited and the tenders submitted by tenderness who resort to canvassing will be rejected.

(M.SUJATHA)
Assistant Engineer
for ADG(E) (SZ)

Encl:-

1. Technical Specification - (Page 5-18)
2. GTC - (Page 19-23)

Specifications for 3 Phase, 4 Wire, 30 kVA on line Uninterrupted Power Supply System

Specification No.: UPS_30KVA/ December 2011-ADG(E)(SZ)

1 SCOPE:

The specifications are for the SITC of 3 Phase, 4 Wire, plus Ground, 30 kVA, True on-line double conversion continuous operation (defined as VFI in the IEC62040-3 UPS Specifications), solid-state Uninterruptible Power Supply (UPS) along with Battery for use in AIR FM transmitters (power factor better than 0.9). The UPS system has to operate in conjunction with the existing Building Electrical System and Diesel Generator (62.5 kVA) to provide power conditioning, back-up power protection, and power distribution for the critical loads.

2 GENERAL:

The UPS should be reliable and stable in operation under Indian tropical conditions. In India climate may be extremely humid and dusty besides varying from very cold to very hot. It should have a front panel LCD display to show various parameters of the system to ease the monitoring. The UPS system shall be capable of running in stand-alone Mode as per the attached configurations shown in Fig. 1. UPS is to be supplied with 30 minutes back up time at full rated capacity.

It will be the responsibility of the Tenderer to arrange for the demonstration of offered UPS at company site (preferably in Chennai) and show, practically, compliance of various parameters claimed in the tender if required by AIR.

3 ESSENTIAL FEATURES:

1. (a) The system should be fully DSP controlled in all respects (i.e. rectifier control, inverter control, display, digital diagnostics.), solid-state type, utilising On Line Double Conversion technology (high frequency PWM using IGBT Rectifier & inverter section)
(b) The system should be capable of providing continuous high quality sinusoidal waveform power for electronic equipment loads.
(c) The system should conform to voltage frequency independent technology.
2. The DSP based controller should have following characteristics:
 1. Diagnostic monitoring achieved by Fast Fourier Transform (FFT) of spectrum analysis
 2. Adaptive control by having the speed to monitor and control the system concurrently
 3. Real time generation of smooth, near optimal reference profiles and move trajectories
 4. Control power switching and inverters and generate high resolution outputs

Note: The firm shall mention the DSP chip used in the control system of the UPS.

3. The UPS should offer low input current harmonic distortion (THDI), good regulation, excellent transient response and high stability.
4. (a) The system should have a monitoring panel (LCD Based) with various types of fault alarms and metering functions including:
 - i. Output voltage, current & frequency.
 - ii. Input voltage, current & frequency.
 - iii. Bypass Voltage, Current & frequency.
 - iv. Battery capacity, backup time left & bad battery indication.
 - v. Temperature of System, Inverter section and Rectifier section.
- b) The UPS system should display both RMS value and Peak value of load current.
- c) The UPS system should have facility to generate aural alarm for bad Battery condition.
5. a) The system should have wide input voltage and input frequency tolerance as specified in Rectifier section.

- b) Transient Voltage Surge Suppressor (TVSS) **(ANSI/ IEEE C62.41 1991 C1 (6KV @3KA))** should be provided at the input & output of the UPS System.
6. The system should have provision for controlling all the three phases individually, even in case of 100% unbalancing at the output with even 0% load on one phase. There should be no change in regulation in phase voltage with 100% unbalancing.
 7. The system should be capable of supplying energy to load from commercial mains without any break in case of phase reversal at the input. It should also generate aural and visual alarm in such a case.
 8. a) The system should have provision of protection for
 - (i) Input under voltage (ii) Input Over Voltage (iii) Output Over Voltage (iv) Output Over load (v) Output short circuit (vi) Battery under Voltage (vii) Over temperature (viii) DC Over currentb) The system should generate aural and visual alarms for above-mentioned conditions.
 9. The system should have Controls as
 - (i) Input Circuit Breaker
 - (ii) Bypass Circuit Breaker
 - (iii) Maintenance Bypass switch
 - (iv) Inverter ON / OFF Switch
 - (v) Alarm acknowledge switch
 10. (a) The system should have facility to store the Logs of the events being monitored by monitoring system.
 - (b) The UPS system should have the capability to store a minimum of last 100 events.
 - (c) The UPS should have in – built digital fault diagnostic through stored events in UPS system.The system should also include a 45 KVA Isolation Transformer in the UPS to provide protection from electrical surges/noise (inherent and generated both) present in the input power supply.
 11. The firm should specify the nos. & type of desired batteries, which shall be part of the system to be offered. **[The batteries of known & reputed world –class manufacturer only will be accepted.] The maintenance free-batteries VRLA type shall only be acceptable. The detailed technical specification of batteries with their working life is also to be specified and provided with the offer.**
 12. A- The battery charger should have provision of
 - (i) Monitoring battery temperature and accordingly adjusting the charging level to enhance the battery life.
 - (ii) Programmable battery charging which can be programmed to enhance battery life.B- Battery charging current should be adjustable from 10% to 80% through Microprocessor & Displayed.
C- For battery sizing calculation, temperature is required to be taken as **20°C**.
 13. The system should have communication port RS 232 and suitable software for monitoring & diagnostics etc. should be supplied.
 14. The system should be designed with scientific forced air-cooling for proper ventilation. Acoustic noise level should be kept at minimum.
 15. The UPS system output should be isolated from the DC circuit of the UPS.
 16. The project, consisting of Supply, installation and commissioning of the Online UPS, will have to be implemented on turnkey basis in three months time from the date of placement of order
 17. The firm should specify the total area requirement for installation of the system including batteries. A floor-Layout plan should be attached.
 18. The system that shall be quoted against this tender should include all switchgears, cables, earthing etc.

Terminals for input 3 phase, 4 Wire, power supply & output power supply should be provided. Power supply sub distribution in the output is not in the scope of this tender. A block-schematic diagram with all items should

be provided.

19. The system that shall be quoted against this tender should be capable of running continuously round the clock, seven days a week without interruption or failure.
20. Firms offering the system **should have experience of at least three years** in the installation and commissioning of ON_LINE UPS for similar capacity on turnkey basis. **The tenderer shall enclose the user list (along with phone number, fax, email) of such installations therein clearly mentioning the name of the users/ installations, date of system installations, details of system installation completed and level of satisfaction of the user.**
This office shall reserve the right to contact such users to cross check and obtain feedback about the system. **The tenders without the user list shall be rejected.**
21. Compliance statement should be given from the original manufacturer of the UPS on its letterhead duly signed and stamped by the OEM.
22. The UPS System quoted must conform to the latest international standards of safety and EMC. The conformance to such standards (indicating standard's name & number) must be stated in compliance statement. A certificate issued to OEM by authorized international/ national agencies should be submitted along-with the declaration from OEM in this regard. In general, following standards should be met: -
 - A. Safety: IEC 62040-1 / EN 50091-1
 - B. Emission and Immunity: IEC 62040-2, Class A / EN 50091-2 (Class A)
 - C. Performance: IEC 62040 –3/ EN 50091 – 3
 - D. CE-Marked in accordance with EEC directives 73/23 “low voltage” and 89/336 “electromagnetic compatibility”

23. The UPS manufacturer must be ISO 9001-2000 certified company. A copy of the certificate should be enclosed with the offer.

24. The tenderer/ manufacturer should have after sales support for service of UPS model offered in case of any problem during normal operation. The after sales support network details of the model offered to be given in the technical bid

4 A. SYSTEM

1. Technology: The UPS shall be designed to operate as **true on-line, double conversion DSP controlled type UPS**

strictly as per the definition of IEC 62040-3 as follows:

a) Normal Operation:

The UPS inverter should continuously supply the critical AC load. The rectifier & charger should take power from the AC input source, convert it to suitable DC and supply to the inverter as well as charge the Batteries on Automatic Float cum Boost Mode.

b) Upon Mains Failure:

Upon failure of AC input power, the critical AC load should continue to be supplied by the inverter, which should obtain power from the battery. There shall be no interruption in power to the critical load upon failure or restoration of the AC input source (Mains/ DG).

c) Upon Mains Restoration:

Upon restoration of AC input power, the Rectifier/Charger should automatically restart walk-in and gradually take-over the supply to inverter and charging to the battery.

d) Static Bypass:

UPS Module should have in-built 100% rated static Bypass Line.

All the loads should be transferred to the Static Bypass Line of the UPS without any break for the following conditions:

- i. If the UPS fails
- ii. If overload beyond 150% for 1 minute is faced by the UPS
- iii. If UPS sense over temperature (i.e. inverter exceeding 65 Deg Celsius simultaneously).
- iv. If the UPS inverter is put-off

2. **MTBF of the System:** Bidder to specify and justify MTBF of the system

3. **Capacity:** **30 KVA at power factor 0.9**

B.RECTIFIER SECTION

| | | |
|----|---|--|
| 1. | (a) Technology | DSP Controlled IGBT Rectifier with input filters to reduce the harmonics. |
| 2. | Input | 3-phase, 4-wire plus Ground |
| 3. | Input Voltage | 320 to 460 V (at full load) |
| 4. | Input Frequency | 47 – 53 Hz |
| 5. | Input Power factor | > 0.99 |
| 6. | Input Current Harmonic Distortion(THDi) | ≤ 3% |
| 7. | Soft start (0-100%) | > 10 Sec |
| 8. | DC ripple voltage | < 1% |

Note: Bidder should Specify the following Parameters for quoted UPS system

- i) Rectifier Input current (Max.)
- ii) Max. Rectifier output current
- iii) Rated Output current (with battery in fully charged state)
- iv) Max. Output Voltage

C. INVERTER:

| | |
|---|--|
| 1. Technology | |
| 2. Output Voltage | |
| 1. Nominal: | |
| 2. Static: | |
| 3. Output (Active power with load PF from 0.9 Cap to 0.9Indu) | |
| 4. Output Power Factor | |
| 3. Output voltage regulation: | |
| a) 100% Balanced load | |
| b) 100% Unbalanced load | |
| c) Transient response (100% step loading) | |
| d) Recovery time to steady state ($\pm 1\%$) | |
| 4. Output frequency regulation | |
| a) Line Connection: | |
| b) Self Connection: | |
| 5. Overall Efficiency: | |
| (From I/P to O/P of the U.P.S. system) | |
| 6. Output voltage Distortion: (at rated load) | |
| 7. Audible noise level at 1 meter | |
| 8. Overload capacity: (a) Inverter | |
| b) Bypass Mode | |
| 9.(a) Phase Displacement | |
| (b) Inverter Short circuit current | |
| (c) Protection rating | |
| 10. RF Suppressions: | |
| 11. Communication Interface: | |
| 12. On- Line Battery testing: | |
| 13. (a) Mains failure, | |
| (b) Battery Low, (c) UPS Fault | |

Fully DSP based IGBT/PWM Inverter
3-phase, 4-wire plus Ground
380V- 415V AC (adjustable), 50Hz
400 \pm 1% V AC, 50Hz
27 KW at .9 power factor load
0.9
< $\pm 1\%$
 $\pm 2\%$
< 5%
< 5 msec

 $\pm 1\%$ (meeting input frequency range of 47-53 Hz.)
 $\pm 0.05\%$
>95% (for all loads from 50% to 100%)
< 1% linear load,
< 3% non-linear load with 3:1 crest factor
60 dBA or better
Up to 125% 10 min
Up to 150% 1 min
Continuously up to 135% of rated current 135% to 170% of rated current for 1 min > 170% of rated current for 2 seconds
120^o₊₁ for Bal. Load
120^o₊₂ for UN Bal. Load
300% for 0.5 sec.
IP20
As per BIS & EMC standard.
RS232/C, SNMP/HTTP Network interface, modem card. Required.
Vendor to provide Audio/Visual alarm [also as mentioned under SI.No 3.Essential features, sub class 8. (a)] at remote location
(maximum distance 100 meter) in addition to local.

14. Front panel Display
(Please submit the details of front panel display)

LED mimic with LCD display. The LCD should display the following:

- a) Input side:
 - i) Voltage
 - ii) Current
 - iii) Frequency
- b) Output side:
 - i) Voltage
 - ii) Current (RMS value) & Peak value.
 - iii) Frequency
- c) Intermediate DC:
 - i) Voltage
 - ii) Current
 - iii) Remaining time (in
- d) Bypass:
 - i) Voltage
 - ii) Current
 - iii) Frequency
- e) Alarm History

D. BATTERY BANK & BATTERY

1. Battery Bank Capacity Calculation to be provided by the vender for **30 min.** back up
2. Nominal output current capacity ” ” ”
3. No. of Battery String 1 set complete
4. DC Voltage of the battery bank Should be Minimum 240 V
5. Type: 12 V Battery of Maintenance Free **Valve Regulated Lead Acid (VRLA)**. (Please submit the catalogue of offered battery) with its detailed specifications along with the charging & discharging characteristics (Graphs from the OEM).
6. Backup time: Minimum **30** minutes (at the End of Life (EOL) of Battery) for 100 % load.
7. Charging Voltage Standby Use 13.5v t0 13.8v at 20°C
Cycle Use 14.4v t0 15v at 20°C
8. Cutoff Voltage 1.70-1.75 V per Cell (should be Selectable)
9. CODES & STANDARDS The supplying battery manufacturer shall be ISO 9001/14001 certified. The battery design shall be of proven technology. The manufacturer shall have 5 years of field experience. Copy of Certificate for „VRLA Battery” must be attached with the Technical Bid.
10. DESIGN All battery shall be of the same manufacturer [Make: Amar Raja/GNB/Rocket/(**AGM – GEL Technology**)]and model. The battery shall be “valve-regulated” (maintenance free) type.
11. Life 7 Years designed life at 27 degrees C on full float.
12. Life Cycling Characteristics Each battery shall be designed to provide 4000 cycles at 20% depth of discharge (DOD) at 20 degrees C and 1200 cycles at 80% DOD at 20°C
14. Deep Discharge Following an equalization charge, battery shall be capable of being recharged to rated capacity from a discharge down to zero volt per cell.
15. Recharge Rate The battery shall be capable of a 90% recharge within 12 hours
16. Operating Temperatures and altitude The battery shall be capable of operating in temperatures ranging from 0°C to +40°C. Battery shall withstand hard freezing without damage to the alloy, plates, or cell container assembly. The battery shall be capable of operating at a maximum of 3000m from ground level (AMSL).
17. Battery Orientation No special ventilation shall be required under normal operating conditions. No separate “battery room” shall be required to house the battery unit. Battery bank shall have clear removable covers to facilitate visual inspections and allow ease of service.
18. Self-Discharge The battery shall have a maximum self-discharge rate of 0.5-1.0% per week at 27°C.

19. Housing
The Battery system should be installed & supplied suitable Enclosure/Gage (Accidental & shock proof) with M S Racks.
20. Product Identification Label
Each battery shall have a self-adhering label identifying the product manufacturer, model and nominal Amp/Hour capacity. The label must be readily visible from the front of the battery. The label shall not wear out throughout the life of the battery.
21. ATP
Acceptance Test Procedure should be provided with the offer.
22. Capacity Testing
Each battery shall be capacity tested at the manufacturing facility as per standard battery testing procedure. For each battery, battery performance tables and curves shall be submitted with the supply. The curves may be obtained by test or by calculation.
23. Leak Detection
Integrity of the container and post seals shall be verified in the battery manufacturing process using an automated helium leak detection process.
24. Seismic Requirements
Batteries shall be packaged in steel modules that meet Seismic requirements when stacked horizontally.
25. Accessories
Each battery shall be furnished with the following accessories:
1. Each battery system shall include the necessary inter-battery and inter-module connectors and terminal plates. The connectors shall be lead-tin plated copper and shall include stainless steel hardware.
2. One set of numerals (one numeral per battery) suitable for permanent attachment to batteries.
3. Assembly and connection drawings.
4. Each module shall include an easily removable transparent “snap on” safety shield to cover all connectors.
26. Recycling services
The manufacturer must provide worldwide recycling services to properly dispose of spent lead-acid batteries. These services must include proper instructions for the packaging, transportation, and beneficial recycling as required meeting E.P.A. guidelines (or other applicable agencies) for the safe handling of lead-acid batteries. Documentation of disposal must be provided.
27. Max. Battery Charging current with nominal load
To be specified (Battery charging current should be selectable from the front panel of UPS system up to above maximum value)
28. Warranty
The battery system should have warranty for 24 months from date of installation or 30 months from the date of dispatch whichever is earlier.
29. The bidder should submit battery sizing calculation justifying following points:
- No. of Batteries
 - Capacity of battery (Ah), (By considering the K factor, efficiency of system, Temperature correction factor, ageing correction factor, etc.)
 - DC bus voltage
- The total required area for battery installation should also be mentioned.

E ISOLATION TRANSFORMER

ISOLATION TRANSFORMER

The isolation transformer should be three phase , naturally cooled type, housed in one steel cubicle provided with unidirectional cast iron wheels at bottom & lifting hooks. at the top The cubicle enclosing the isolation transformer should have doors on front and rear side, bolted side covers and removable top cover.

- 01. AC Input:** Star 3-Phase ,415 Volt $\pm 10\%$ (Phase to phase)
- 02. AC Output:** Star 415 Volt $\pm 10\%$ (Phase to phase)
- 03 Frequency:** 47 to 53 Hz
- 04 Capacity :** 30KVA 3Phase (10KVA PER PHASE)
- 05.Dutycycle& Use:** Continuous ,indoor
- 06.Common mode Noise Rejection:** Better than 110 d B
- 07.Load Regulation:** <4%
- 08.Insulation Resistance:** More than 500 Mega Ohms at 500V
- 09 Terminals:** Stud on fiber glass plate at rear
- 10 Cable entry:** Bottom

F Spares & After Sales supportt

1. After Sales Support network for the model offered : The manufacturer or The tenderer should have after sales support for the model of UPS offered
- 2.. The UPS manufacturer shall directly employ and national field service network staffed by factory trained field service engineers to provide start up, maintenance and repair of the UPS equipment. This is an essential requirement and the service center's list must be provided along with the technical offer. Parts must be available through the service organization 24 hours a day, 7 days a week, 365 days a year
- 3 The minimum recommended essential spares (modules, PCBs, Components etc) required for maintaining the continued service of the UPS in a reliable manner shall be quoted separately by the supplier positively failing which offer is liable to be ignored. The spares shall not become part of bill of material of main UPS System. The minimum, recommended essential spares may be based on predicted rate of failure and requirement for three years. The spares cost shall not be included to decide lowest offer for UPS System
4. The manufacturer shall also give a certificate attached with the offer to supply maintenance support and all spares during the lifetime of the UPS System. The life of the UPS System should be certified by the manufacturer. This is an essential requirement. The life of the UPS should be more than Ten years

5. **BILL OF MATERIAL (To be attached with Technical Bid without price). For one site (Total 11 sites)**

(Bill of material must be in the format given below for technical and commercial quotes).

| Sl. No. | Description | Make | Model | Quantity per site |
|---------|---|------|-------|----------------------------|
| 1. | One set of 30KVA IGBT/PWM based (Rectifier & Inverter), Fully DSP based Double Conversion UPS system. [(3 Phase, 4 Wire, input - 3 Phase, 4 Wire Output] as per AIR specs No. UPS_30KVA/December_2011-ADG(E)(SZ), each comprises of | | | |
| 1.1 | UPS 30 KVA , 3 Phase ,415 V as per AIR Specification including Make & Model | | | One No |
| 1.2 | 100% in built Static Bypass | | | One No |
| 1.3 | 100% rated Maintenance Bypass | | | One No |
| 1.4 | Battery Pass Isolation Device of appropriate rating | | | One No |
| 2. | Maintenance Free VRLA type Battery Bank suitable to provide 30 minutes (minimum) backup (EOL) as per tender specification. Total Battery Bank Capacity: DC voltage:12v No. of Batteries with UPS: | | | To be calculated and shown |
| 3. | Input Isolation Transformer -45 KVA | | | 1 No |
| 4. | Remote Status display panel with interface cables | | | One no |
| 5. | Any other item required for the completeness of the UPS system. | | | |
| 6 | Installation Testing and Commissioning of the UPS system including double earthing as per electricity rules.. | | | One Job |

At the following All India Radio FM transmiiter sites

1.Chithradurga 2.Kothagudem 3. Mehaboob nagar

6. STANDARD TERMS AND CONDITIONS FOR THE COMPLETE OFFER:

6.1 COMPLIANCE:

(a) A point-by-point compliance statement from the principal manufacturer in respect of all the points, sub-points and para laid down in this specification from page 1 onwards is to be enclosed along with the offer. Mere signature on a copy of our specification shall not be accepted as a compliance statement. Compliance statement in the format as indicated below only shall be accepted. The manufacturer should also record the performance figures of the equipment offered in the quote for which the compliance statement is enclosed. The figures so mentioned should be supported by highlighted record of these in the technical literature/data sheets enclosed with the tender. The data sheets should be included as desired in para 6.5 of this specification. Any deviation from the specification detailed in the compliance statement is to be highlighted separately. Offers without the proper & duly completed compliance statement are likely to be rejected with the sole responsibility of tenderer and no further claim/correspondence will be entertained. **Page no. of location of data sheet should be given in page no. Column. One copy of compliance statement and Bill of material should also be given on CD-ROM.**

| Sl.No. AIR Spec. | AIR Specs | Compliance (Yes or No) | Performance fig. of equipment offered | Deviation in case of non-compliance | Optional items if any required to make the system compliant to AIR Specs. | Features in the system offered which exceed AIR Specs. | Page No | Remarks |
|------------------|---|------------------------|---------------------------------------|-------------------------------------|---|--|---------|---------|
| 1 | Scope | | | | | | | |
| 2 | General | | | | | | | |
| 3 | Essential features (As mentioned in Sl.No.3 all items from 1 to 23,& Sl.No.4 ABC&D items) | | | | | | | |

6.2 SPARES:

1. Six Nos. Of semiconductor fuses of identical rating as in the system, should be provided with the system.
2. The Necessary spares required for the maintenance of the equipment should also be quoted separately.
3. Value of such spares should not exceed 5% of the total cost of the equipment. AIR shall exercise option to Order spares.

6.3 ACCESSORIES:

All essential accessories that shall complete the system as desired in “Essential features” (Para 3 of the specification) should be included in the offer.

6.4 PRICE:

The tenderer along with the offer must quote item wise prices of all the items, which constitute the system, separately. Prices of all the optional items should also be included separately.

6.5 TECHNICAL LITERATURE:

- a) Two sets of technical data sheets of the equipment offered & installation, operation and service manuals shall be supplied with the equipment.
- b) One set of above shall be supplied to this Directorate along with the tender for the purpose of evaluation.
- c) The compliance of technical parameters as mentioned in para 4 of this specifications should be supported by the figures in the published data sheets of the equipment/ system.

6.5.1 Installation Manual: A detailed installation manual for the installation of UPS System should contain at least the following details:

- a) A floor equipment layout plan with dimensions in meters for installing the UPS System in the hall. All the dimensions of hall with ceiling height, and equipment to be installed should be provided.
- b) Isometric view of UPS System and allied equipment diagrams with dimensions in meters are to be provided.
- c) All installation drawings with dimensions are to be provided.
- d) All mechanical assembly drawings of the UPS System with dimensions are to be provided.
- e) All the views, i.e. Front, rear, top and side, of the UPS System with dimensions are to be provided.
- f) A detailed diagram showing the airflow Inlet to the UPS and the out let route should be provided.
- g) All unpacking/ installing details of the UPS are to be provided.
- h) A detailed writes up in English regarding installing the UPS System along with its associated equipment items should be provided.
- i) The procedure of alignment and adjustment of various assemblies, sub- assemblies of UPS System to be described in details in the installation manual.
- j) The procedural details of alignment of all stages, control circuits and input/output stage of the UPS System should be described with practical examples in this manual.
- k) All do's and don'ts which are essential for safe installation of the UPS System should be described in the installation manual.
- l) A detailed description with all relevant circuit diagrams for the control circuit of the UPS should be provided.
- m) The detailed procedure and possibilities of By-passing UPS unit and control circuit should be described with diagrams in this manual.

6.5.2 Operation and Maintenance Manual: A detailed operation and maintenance manual with all drawings, circuit diagrams, of all PCB's assemblies, subassemblies are to be provided.

- a) All details regarding putting "ON" with the sequence of operation of the UPS are to be provided in the manual.
- b) The details of all electrical/electronic circuits in various stages of the UPS used along with their write-ups are to be provided in this manual.
- c) All precautions and detailed instructions regarding operation of the UPS System should be provided in this manual.
- d) The detailed description with examples for taking various measurements with the measuring equipment along with the test bench details for measuring various parameters for the UPS should be provided in the manual.
- e) The various tests and measuring equipment required and essential for the routine maintenance and calibration along with the procedure for taking such measurement calibration should be provided in the manual.
- f) The lists of all parts/components/assemblies/subassemblies with their part numbers and with the source of supply with supplier's address etc. are to be provided in this manual.
- g) The details of ordering specifications for all parts / components / subassemblies / PCB / units should be listed in this manual to facilitate reordering of spares as and when required during the life time of this UPS System.
- h) The details of self-check for the UPS System and internal calibration are to be described in the manual.
- i) The detailed procedure for trouble shooting of the UPS System preferably up to component level should be available in the manual. Various test fixtures and accessories required for the maintenance/ repair of the UPS System should be clearly described and detailed out in this manual. The systematic trouble shooting/ fault tree and flow diagram should be provided for diagnosis of the fault with its remedial measures in this manual.
- j) The various assemblies/sub assemblies, PCBs, Parts and Components should be clearly marked to define its functions. The schematic diagrams and references should be described in such a way so that the parts/assemblies/PCBs etc. can easily be identified from the components layout diagram provided in the manual.
- k) All the controls, switches, knobs, interfaces and indications should be clearly marked to show their circuit designation and functions.
- l) Accessibility for testing, replacing of components, ease of maintenance, calibration and adjustment should be the main design features of the UPS System.
- m) The manual should have description regarding various interfaces, connectors, connecting cables and accessories required for the satisfactory function of the UPS System. All such items required should be provided by the manufacturer along with the UPS system.

6.6 INSPECTION:

- (a) All the equipment to be supplied against the supply order for this tender shall be subjected to inspection at manufacturer's facility by AIR.
- (b) The installation shall be subjected to inspection at site by AIR. The firm shall submit all the drawings, wiring/ connection diagrams etc. at the time of inspection. The Manufacturer shall provide all technical equipment required for inspecting the system to the inspector.
- (c) An acceptance test procedure for the UPS system should be supplied by the firm one month in advance of the inspection of the system so that same procedure would be followed by AIR inspector for acceptance of the system.

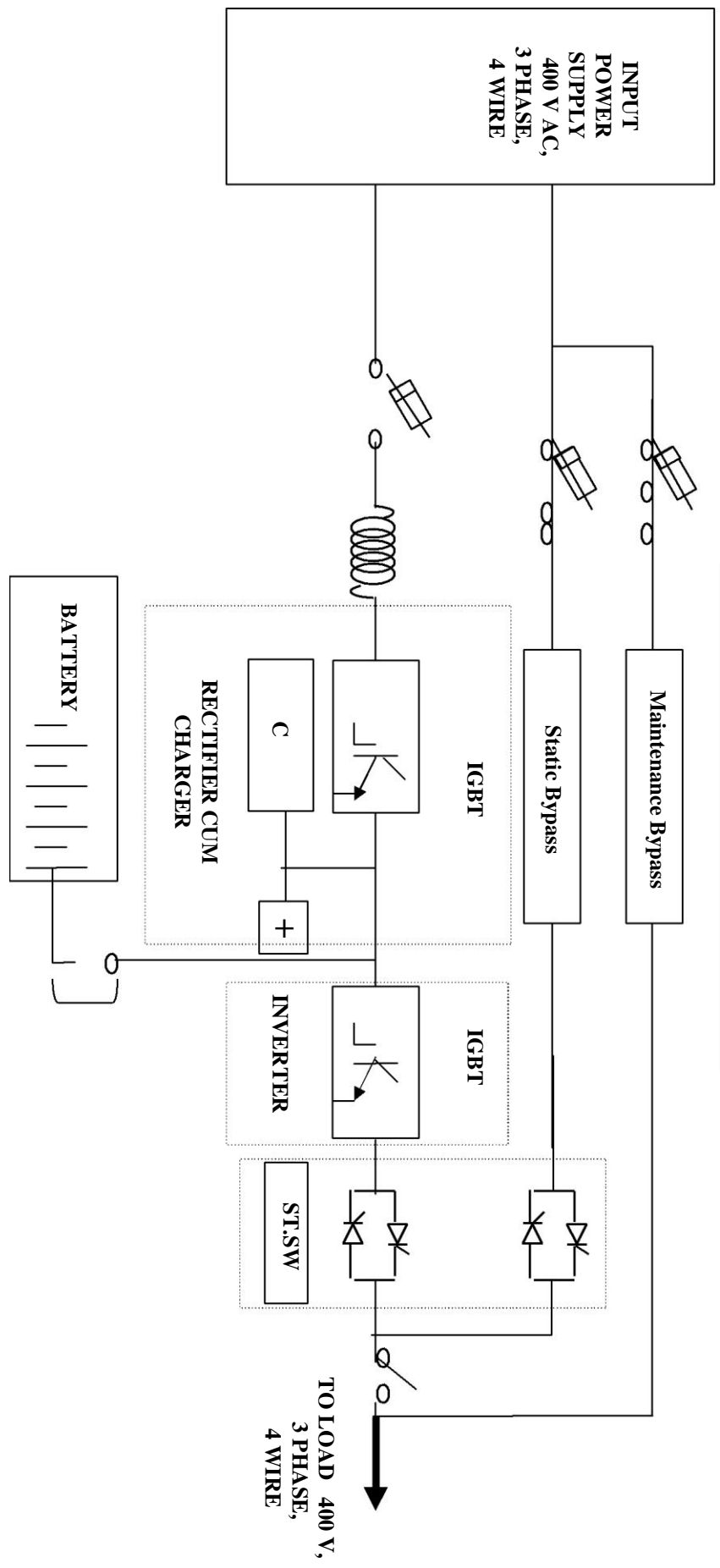
6.7 GUARANTEE:

The equipment shall be guaranteed against any manufacturing defects for a period of two year from the date of supply. Any parts failing during the guarantee period shall be repaired/replaced free of charge by the supplier at the U.P.S. site.

6.8 INSTALLATION AND COMMISSIONING:

The firm shall be ready to carry out the installation work at any time of a day (24 Hrs) and any day of the week (7 days) as permissible on the particular site.

FIGURE-1
UPS SINGLE MODULE -SUGGESTIVE
CONFIGURATION



GENERAL TERMS AND CONDITIONS FOR WORK ORDER

1. **NAME OF PURCHASER** : **The President of India**
2. **PAYING AUTHORITY** : **The Additional Director General (E) (SZ)**
All India Radio & Television
Swami Sivananda Salai,
Chennai-600 005.

3. PAYMENT TERMS:

- (i) 80 % of the contract price for the equipments/materials inclusive of excise duty and Sales tax shall be paid on initial inspection and delivery of equipments at site in good condition.
- (ii) 20 % of the contract price for equipments and 100 % of installation charges on satisfactory completion of installation, commissioning and handing over.

4. BILLS:

All the supplies and works shall be in conformity with the order and all the part bill shall be prepared in quadruplicate in the same format as that of the order. All those part bills shall be submitted to the consignee for necessary certificates and onward transmission to the paying authority.

5. SECURITY DEPOSIT:

The contractor shall furnish the security deposit within 2 weeks of placement of order at the rate of 10 % of the contract value at the time of signing the contract.

The security deposit shall be furnished in favour of "The ADG(E) (South Zone) AIR & TV, Chennai-5" in any one of the forms mentioned below.

- a) Cash in full (b) DD Payable at Chennai (c) Bank Guarantee from any Nationalized Bank valid upto the end of warranty period as per contract. The warranty period starts from the date after completion of the SITC work and taking over. (Not from the date of supply of DG and Standard Control Panel set).

The EMD received will be returned after receipt of S.D. The security Deposit shall be refunded in full on completion of successful guarantee/Warranty.

6. DESPATCH INSTRUCTIONS:

The packing and marking of goods shall be as laid down in clause-12 of general conditions of contract DGS & D 69 (Revised).

- a) The contractor shall arrange to dispatch the goods duly insured direct to the consignee after prior intimation for delivery at site by whichever mode of transport he may choose, to ensure safe delivery of goods at site. Un loading shall be done at site at the contractor's Expense. Only storage space will be provided by the consignee. The contractor will provide his own security like locking etc and store the materials at his own risk.

b) The contractor must submit his challans in triplicate to the consignee sufficiently in advance of the actual arrival of the stores at the destination failing which he will be held responsible for any subsequent discrepancies between the actual receipt and the material detailed in the challan received later. The challan must also contain the following informations:

1. Brief description of stores.
2. Railway/ Lorry Receipt No. & Date.
3. Supply order No. & Date.
4. Inspection note No. & Date

c) The consignment received at site shall be opened and checked for Shortages/damages by the contractor himself. He shall show all the Materials received at site to the consignee to enable him to certify Receipt of stores in good condition. However, in exceptional circumstances, the contractor may request the consignee to check the consignment on his behalf. In such cases the consignee shall notify the contractor of the shortage/damages immediately on receipt of consignment at site. Expenses incurred, if any, in any, in checking the consignments shall be debitable to the contractor's account.

7. INSPECTION:

a) SCOPE OF INSPECTION:

i) PRE INSPECTION:

Manufacturers / Contractors must satisfy themselves that the stores are in accordance with the terms of the contract and fully conform to the required specification by carrying out thorough pre-inspection of each lot before actually tendering the same for inspection to the inspecting officer nominated under the terms of the contract. A declaration by the contractor the necessary pre-inspection has been carried out on the stores tendered shall be submitting along with the challan. The declaration will also indicate the method followed in carrying out pre-inspection showing the features checked, tested and will have the certificates attached to the challan/declaration. If the Inspecting officer finds that pre-inspection of the consignment' as required above has not been carried out the consignment is liable for rejection.

ii) INITIAL INSPECTION:

All the supplies including fabricated items and bought out items shall be inspected before actual inspection. The place of inspection shall be as at below. Also the installation at the site shall be inspected periodically during installation. If the inspecting officer finds initial inspection that the supplies are not according to specification, the suppliers are liable for rejection. The purchaser may at his discretion waive initial inspection in respect of those supplies which bear ISI certificates or manufacturer's test certificates. The contract shall approach the inspecting officer for inspection at least two weeks in advance of the actual date of inspection. All arrangements for inspection shall be made by the contractor. Any deviation in stores after initial acceptance by the Inspector and their receipt by the consignee shall be to the account of the contractor. The contractor shall forward the relevant copies of the inspection certificates of the stores to the consignee along with delivery challan.

iii) FINAL INSPECTION:

The entire installation shall be inspected by the inspecting officer on completion of
Installation, commissioning and Complete work at the project.

INSPECTING OFFICER: Consignee or Nominees of the ADG(E) (SZ)/I.O. at Site.

8. INSURANCE:-

The contractor shall arrange for the insurance covering the risk during transit, Storage and installation till commissioning. All the charges for such insurance shall be borne by the contractor.

9. ADDITIONAL QUANTITIES:-

The purchaser reserves the right to place order for additional quantity upto 100% of the ordered quantity at the same rates and terms and condition during the currency of the contract.

10. PENALTY FOR DELAY:-

If the contractor is unable to complete the supply, installation, testing and commissioning within the stipulated time limit the purchaser may at his option allow such additional time as may considered justified with/without penalty and without altering terms and conditions of the order. In the event of failure of the contractor to complete the supply, installation testing and commissioning within the stipulated time or the extended time, the purchaser has the right to impose penalty of Rs.350/- per week or part thereof for every Rs.1,00,000/- of the total contract price. The contractor's liability for delay, however, shall not exceed 5% of the total contract price.

11. GUARANTEE / WARRANTY:-

The contractor shall accept clause-18 of the Form No. DGS & D-71 with exception that his obligation shall be limited for a period of 24 months from the date of taking over completion of the successful performance excluding down time during which the equipment was not working satisfactorily due to defective parts, faulty material/design/workmanship or fault erection. During the guarantee period the contractor shall repair or replace free of charge any parts that will become defective due to faulty material design, workmanship or erection.

12. CONDITIONS OF CONTRACT:-

DGS & D-68 (Revised and DGS & D-71 as amended upto date. However, Such of these conditions stipulated on this tender shall supercede corresponding conditions in DGS & D-71. The contractor shall sign a contract agreement form in triplicate in the prescribed Proforma and submit the same alongwith Security Deposit within 15 days. The complete form with the purchaser's signature shall be sent back to the contractor. No supplies will be made and no work shall start unless the agreement is signed by the contractor and the purchaser.

13. SPECIAL CONDITIONS:-

In addition to the terms and conditions contained in the general conditions of contract DGS & D-68 (Revised and DGS & D-71, the contract would also be governed by the following special conditions:-

- i) In case where only a portion of the stores ordered is tendered for inspection at the fag end of the delivery period the purchaser reserves the right to cancel the balance quantity not found

acceptable after carrying out the inspection at the risk and expense of the contractor. If however, the stores tendered for inspection are found acceptable the purchaser may grant an extension of the delivery period subject to the following conditions:-

- (a) That no increase in price on account of any statutory increase in or fresh imposition of customs duty, excise duty, sales tax or on account of any other tax or duty leviable in respect of the stores specified in the acceptance of tender shall be admissible on such of the stores as are delivered after the expiry of the delivery period stipulated in the A/T.
 - (b) That notwithstanding any stipulation in the contract for increase in price or any other grounds no such increase which takes place after the date of delivery stipulated in the A/T. shall be admissible on such of the stores as are ordered after the expiry of the delivery period stipulated in the A/T.
 - (c) But, nevertheless the purchaser shall be entitled to the benefit of any decrease in price on account of reduction in or remission of customs duty, excise duty, sales tax on account of any other ground stipulated in the price of variation clause which takes place after the expiry of the date of delivery stipulated in the A/T.
 - (d) The contractor shall not dispatch the stores till such time extension in delivery period is granted by the purchaser and accepted by the supplier before and extension letter as aforesaid is issued by the purchaser, the same are deemed to be subject to the conditions set out in proceeding paragraph.
- ii) Incase where the entire quantity has not been tendered for inspection within the delivery period stipulated in the A/T and the purchaser chooses to grant an extension of delivery period, the same would be subject to conditions mentioned in (i) above.
 - iii) The contractor shall refund any advance/part payment issued to him in respect of the rejected stores within 14 days of the receipt of intimation from the consignee about the rejection of such prices. This is strictly without prejudice and in addition to the rights provided in the clause-17 (8) of form DGS & D-67.
 - iv) The contractor is required to replace the rejected stores forthwith but in any event not later than a period of 14 days from the date of rejection and the contractor shall bear all the costs of such replacement including freight, if any but without being entitled to any extra payment or any other account.
 - v) Where under the contract, price payable is fixed F.O.R. dispatching station, the contractor shall, if the stores are rejected at destination by the Consignee, be able to, in addition to his other liabilities (including refund of price recoverable in respect of the stores rejected) to reimburse to the purchaser the freight and all other expenses.

14. ENFORCEMENT OF LABOUR LAWS:-

While engaging labour for carrying out obligations under the contract the contractor shall satisfy the conditions laid down under contract labour (Regulation and Audition) Act 1970 and (Central) Rules 1971 as amended from time to time and observe all formalities required as per said Act/Rules. The supplier shall also observe the provision under minimum wages act 1948 (Central) Rules 1950 amended from time to time while engaging labour.

15. FORCE MAJURE:-

If any time during the continuance of the contract the performance in whole or in part by the contractor shall be prevented or delayed by reason of any war, hostility acts of the public enemy. Civil commotion, Sabotage, fires, floods, explosions, epidemics, Quarantine restrictions, strikes, lock-outs or acts of God (therein after restrictions refer to as events and provided notice of happenings of any such eventuality is given by the contractor within 21 days from the date of occurrence thereof, the purchaser shall by reason of such event, neither he entitled to cancel this order nor shall have any claim for damages against the contractor in respect of such non-performance or delay in performance and delivery shall be resumed as soon and practicable after such events have come to an end or ceased to exist. Provided further that if the performance in whole or part or any obligation under this order is prevented or delayed by reasons of any such event for a period exceeding 180 days, the purchaser and the contractor shall meet to find a natural agreement to any effect resulting the reform or the purchaser may at his option cancel order provided also that if the order is cancel the order provided also that if the order is cancelled under this clause, the purchaser shall be at liberty to take over from the contractor at order prices all unused, un-damaged and acceptable material bought out components and stores in course of manufacture in the possession of the supplier at the time of such cancellation or such portion thereof as the purchaser may deem fit accepting such material, bought out components and stores as the supplier may with the concurrence of the purchaser elect to retain.

16. TECHNICAL MANUALS & DRAWINGS

Contractor shall furnish six copies of comprehensive technical manuals for use by the operation staff. Such manuals shall contain instructions from the preventive as well as routine maintenance of the plant. The contractor shall also furnish copies of approved wiring diagrams, schematics, etc., for various items equipment.

17. CANCELLATION:

The purchaser reserves the right to cancel the order in the event of non-performance or unsatisfactory performance by the contractor and recover payment already made if any, along with losses/damages incurred.

**(M.SUJATHA)
Assistant Engineer
for ADG(E) (SZ)**