

TECHNICAL SPECIFICATIONS

- xii) Protection features to take care of faults in DCDB bus, solar controller, solar panel, battery circuit
- xiii) Control circuit to give light indication whether Battery is powered through Solar or Mains/DG etc.

19. LIGHTNING PROTECTION:

There shall be the required number of suitable lightning arrestors installed in the array area. Lightning protection shall be provided by the use of metal oxide arrestors and suitable earthing such that induced transients find an alternate route to earth Protection shall meet the safety rules as per Indian Electricity Act.

20. MANUAL:

An Operation, Instruction and Maintenance Manual should be provided with the Solar PV Power Plant and detail of Wiring and connection diagrams shall be provided with the manual. Training to be given to HPCL's Engineer In-Charge and to Security Supervisor available at each SV station. Training shall include hands-on-experience training on the system. PPTs to be given to HPCL and detailed presentation to be given to HPCL Officers at no extra cost to HPCL.

21. WARRANTY / GUARANTEE:

The complete Solar PV Power Plant must be warranted against any manufacturing / design /installation defects for a **minimum period of 5 years**. PV modules used in Solar PV power Plant must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

The Warranty/Guarantee Card to be supplied with the Solar PV power plant must contain the details of the system supplied.

During the Warranty/Guarantee period, HPCL shall have all the rights to crosscheck the performance of the solar PV power plant. HPCL may carry out the frequent inspections of the solar PV power plant installed and randomly pick up its components to get them tested at Govt./MNRE approved test center.

If during such test any part is not found as per the specified technical parameters, HPCL will take the necessary action. The decision of HPCL in this regard shall be final and binding on the tenderer.

22. TEST REPORTS:

The test certificate of various components of the proposed Solar PV system should be in accordance with guidelines of MNRE for off grid solar PV systems. Test certificates from MNRE approved test centers shall also be considered valid.

23. MARKING:

Radio frequency Identification (RFID) Tag shall be provided inside each PV module- clearly visible from the front with following information as a minimum;

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- (a) Name and Manufacturer of PV modules
- (b) Name and Manufacturer of Solar cells
- (c) Month and year of the Manufacture (separately for Solar cell and Module)
- (d) Country of origin (separately for Solar cell and Module)
- (e) I–V curve for the module
- (f) Peak Wattage Maximum power Current (IM), Maximum power Voltage: 9 V-m and fill Factor (FF) for the module
- (g) Unique serial number and Model number of the module
- (h) Date and Year of obtaining IEC PV module qualification certification (Certification shall be as per latest edition)
- (i) Format with latest Procedures as indicated by MNRE specifications
- (j) Name of the Test lab issuing IEC Certificate
- (k) Other relevant information on traceability of solar cells and module as per ISO 9000 series.
- (l) Modules shall comply with IEC 61215 (quality and design) IEC 6130 (safety) and MNRE (ELDORA3 to ELDORA 280) UL 1703 & MCS (ELDORA 140 to ELDORA 280), CES BS OHSAS 18001;2007, ISO 9001;2008,ISO 14001;2004

24. **WIRING:**

The Wiring shall be done with minimum 2.5 mm² PVC insulated copper wire of 650 volts grade. Wiring to door mounted devices shall be with flexible wires. Wire lugs shall be of crimping type. Bundles of wires shall be routed neatly in vertical or horizontal planes. Individual wires and bundles shall be secured with PVC wire ties, cable lacings or by enclosing in PVC wire trays. Unless specified otherwise all terminal blocks shall be rated for minimum 20 A at 650 volts. The terminal block shall have a white plastic marking strip of the length of the terminal block. Each terminal block assembly shall have 20% spare terminals. All wiring shall be identified by permanent slip-on or clip–on marking sleeves on each terminating wire in addition to marking at the terminal block.

25. **BUS BARS:**

Bus bars shall be sufficiently sized and adequately braced for the supply conditions. The bus bars shall be electrolytic copper and shall be sleeved with 1100 V grade suitable sleeve. Bus joints shall be bolted type and insulated by flame–retardant insulation tape.

26. **EARTHING:**

An earth bus bar of minimum 25 mm x 3mm size made of electrolytic copper/Aluminum shall be provided running the complete length of the solar controller. All non- current carrying parts shall be bonded with flexible copper wires with the earth bus. The earth bus shall have provisions at both ends for connecting it to earth grid conductor.

27. **SEGREGATION:**

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All electrical devices and live parts in the solar controller panel shall be segregated by means of metallic screens. All power connections in case of solar controller shall be segregated from one another and from the electronic circuits.

28. CABLING:

All the cables must be supplied in conformity with IS 694 and shall be of 650 V/1.1 kV grade as per the requirement. Only PVC copper cables shall be used.

Size of the cables between array interconnection arrays to junction boxes, junction boxes to PCU etc. shall be designed in a manner so as to keep the voltage drop and losses to the minimum. All the installation accessories which are needed to install and successfully commission the power plant, shall be provided by the bidder. All the cables required for the system at SVs/IPS is in the scope of bidder. All type of cables (Power, Control etc.) is in the scope of bidder.

29. LV CABLES & ACCESSORIES:

The cables shall be suitable for laying in trays, trenches, ducts, pipe sleeves and conduits and for installation with uncontrolled backfill and possibility of flooding by water and chemicals. Outer sheath of all PVC and PVC cables shall be black in color and the minimum value of oxygen index shall be 29 at 27+ 2°C. In addition, suitable chemicals shall be added into the PVC compound of the outer sheath to protect the cable against rodent and termite attack. All cables covered in this specification shall be flame retardant low smoke (FRLS.) Sequential marking of the length of the cable in meters shall be provided on the outer sheath at every one meter. The embossing/engraving shall be legible and indelible. The overall diameter of the cables shall be strictly as per the values declared by the manufacturer in the technical information.

30. MV POWER CABLES (Earthed):

1.1 KV grade, XLPE insulated type A, stranded Annealed copper conductor up to 16 sq. mm. Stranded aluminum conductor from 25 sq. mm and above steel strip/ armored Extruded PVC inner sheathed & Extruded FRLS PVC outer sheathed st1 type conforming to IS 1554 . The thickness of insulation and the tolerance on thickness of insulation shall be as per Table 2 of IS 1554. The inner sheath shall be applied over the laid-up cores by extrusion and shall be of PVC conforming to the requirements of Type ST-1 PVC compound as per IS: 5831. The minimum thickness of inner sheath shall be as per IS: 1554. Single core cables shall have no inner sheath. The outer sheath for the cables shall be applied by extrusion and shall be of PVC compound conforming to the requirements of type ST-I Compound as per IS: 5831 . The minimum and average thickness of outer sheath for unarmored cable and minimum thickness of outer sheath for armored cables shall be as per IS: 1554.

31. PVC CONTROL CABLES:

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All Control cables for use on low voltage systems shall be 650/1100 V grade with copper conductor, PVC insulated with extruded PVC inner sheathed and extruded FRLS PVC outer sheathed as per IS-1554 unless specified otherwise.

The core insulation shall be with PVC compound applied over the conductor by extrusion and shall conform to the requirements of type A compound as per IS: 5831. The thickness of insulation and the tolerance on thickness of insulation shall be as per IS: 1554. Control cables having 6 Core and above shall be identified with prominent and indelible numerals on the outer surface of the insulation. Color of the numbers shall contrast with the color of insulation with a spacing of maximum 50 mm between two consecutive numbers.

Color-coding for cables up to 5 cores shall be as per Indian standard. The inner sheath shall be applied over the laid –up cores by extrusion and shall be of PVC conforming to the requirements of IS: 5831. The minimum thickness of inner sheath shall be as per IS: 1554. Single core cable shall have no inner sheath. The outer sheath for the cable shall be applied by extrusion and shall be of PVC Compound conforming to IS: 5831. The minimum average thickness of outer sheath for unarmored cables and minimum thickness of outer sheath for armored cable shall be as per IS: 1554.

32. CABLE ACCESSORIES:

The termination and straight through jointing kits for use on the systems shall be suitable for the type of cable offered as per this specification. The accessories shall be supplied in kit form. Each component of the kit shall carry the manufacturer's mark of origin.

The kit shall include all stress grading insulating and sealing materials apart from conductor fittings and consumable items. An installation instruction sheet shall also be included in each kit. The contents of the accessories kit including all consumable shall be suitable for storage without deterioration at a temperature of 45 °C with shelf life extending to more than 5 years.

33. JOINTING KITS:

The straight through jointing kits shall be suitable for installation on overhead trays and trays in cable cellar, concrete lined trenches, and ducts and for underground burial with uncontrolled backfill and possibility of flooding by water and chemicals. These shall have protection against any mechanical damage and suitably designed to be protected against rodent and termite attack. The inner sheath similar to that provided for cables shall be provided as part of straight through joint. The jointing kits shall be from one of the Approved makes.

34. CABLE GLANDS:

Nickel plated brass and shall be double compression type, rubber components type, rubber components used shall be neoprene, complete with double seal cone grip arrangement, check nut PVC hood etc. washers shall be minimum 1.5 mm thick cable glands shall be of weatherproof or flameproof as per area classification .

35. CABLE LUGS:

TECHNICAL SPECIFICATIONS

Cable lugs shall be of tinned copper for copper cable and aluminum lugs for aluminum cable, crimping type & of reputed make.

36. INSTALLATION OF EQUIPMENT / OTHER ACCESSORIES:

It shall be Contractor's responsibility to ensure complete supply & Installation of equipment and accessories with no damages. Handling, shifting to required site location, installation testing and commissioning of all equipment shall be done by contractor with utmost care including required civil work. During installation, all accessories and loose items shall also be inspected by the contractor before their assembly/mounting. Any material not mentioned specifically but required for successful completion of the solar power generation system is in contractor's scope. Contractor to ensure Gate pass is prepared at the time of supply of material. While job execution is taking place contractor to ensure that Permit is available with them.

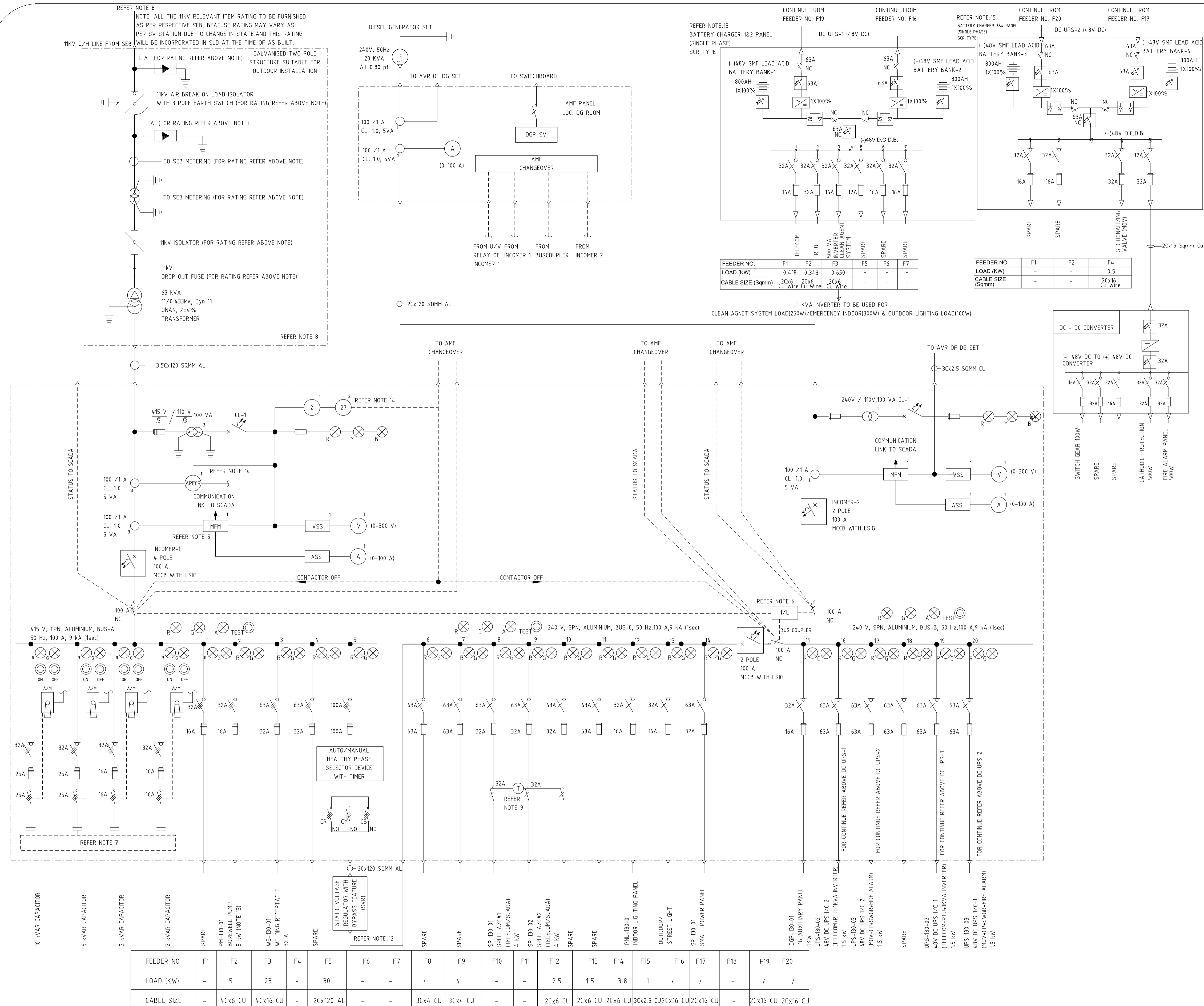
37. RELIABILITY:

All necessary care shall be taken in selection design, manufacture, testing and commissioning of the equipment for ensuring high system reliability. The following design consideration shall be taken into account to ensure maximum availability of the system. There shall be no common device between the two units, the failure of which could cause shutdown of more than one charger. It shall be possible to attend to any individual power circuit for maintenance without affecting the total DC supply. Series-parallel combination of smaller devices to achieve specified rating shall not be acceptable. All the components used shall be time tested and standardized. Vendor shall state the safety factors used in selecting such items as semiconductors, electrolytic capacitors, transformers etc.

38. PAINTING & FINISHING:

All metal surfaces shall be thoroughly cleaned and degreased, pickled and phosphatized. Thereafter, a coat of phosphate paint and a coat of zinc chromate primer shall be applied. After removing all imperfection, all metal surfaces shall be sprayed with two coats of final epoxy based paint as per color IS standard. All unpainted parts shall be plated to prevent corrosion.

DISCLAIMER: This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us other parties.



- NOTES:
- THIS SLD SHOWS DETAILED METERING AND PROTECTION ARRANGEMENT FOR HV SWITCHGEAR FOR SV STATION OF RKPL PROJECT.
 - RATING, BURDEN ETC. OF CTs AND PTs ARE INDICATIVE AND SHALL BE BASED ON SWITCHGEAR VENDOR'S CONFIRMATION.
 - SELECTION, SIZING AND SUITABILITY OF ALL COMPONENTS SHALL BE THE VENDOR'S RESPONSIBILITY AND ALL EQUIPMENT REQUIRED FOR SAFE AND SATISFACTORY OPERATION SHALL BE INCLUDED BY THE VENDOR EVEN IF NOT SPECIFICALLY MENTIONED.
 - VENDOR SHALL PROVIDE COMPONENTS OF MOTOR FEEDER AS PER VENDOR'S TYPE 2 COORDINATION CHART
 - MULTIFUNCTION METER INCLUDES MINIMUM METERING FUNCTIONS LIKE AMMETER, VOLTMETER, POWER FACTOR, FREQUENCY, KWH, KW, KVA, KVAR.
 - WORKING PHILOSOPHY
 - DURING NORMAL OPERATION, INCOMER 1 AND BUSCOUPLER ARE CLOSED AND INCOMER 2 IS OPEN SO THAT NORMAL POWER IS FED TO ALL LOADS.
 - IN CASE OF UNDER VOLTAGE ON INCOMER 1, AUTO STARTING OF DG SET SHALL BE PROVIDED SUCH THAT THE SIGNAL FOR AUTO-START OF DG SET SHALL INITIATE STARTING OF DG SET AND SIMULTANEOUS OPENING/TRIPPING OF INCOMER-1 & BUSCOUPLER AFTER FULL VOLTAGE BUILD-UP, THE INCOMER 2 SHALL CLOSE AND LOADS ON BUS B SHALL BE FED FROM DG SET. ALL CONTROLS SHALL BE THROUGH PLC. UNDERVOLTAGE ON INCOMER 1 IS CONSIDERED ONLY WHEN LINE PT NCB IS NOT TRIPPED, U/V RELAY IS OPERATED AND CONTACTOR IS OPEN.
 - NO MOMENTARY PARALLELING IS ENVISAGED.
 - INTERLOCK SHALL BE PROVIDED BETWEEN INCOMER 1, BUSCOUPLER & INCOMER 2 SUCH THAT INCOMER 2 CAN BE CLOSED PROVIDED INCOMER 1 & BUSCOUPLER ARE OPEN.
 - WHEN NORMAL POWER SUPPLY RESUMES INCOMER 2 SHALL BE OPENED MANUALLY & THEN INCOMER 1 AND BUSCOUPLER SHALL BE CLOSED MANUALLY.
 - AUTO MANUAL SWITCH SHALL BE PROVIDED ON CAPACITOR FEEDER TO CONTROL EITHER FROM APCR (AUTO) OR FROM PUSH BUTTONS ON FEEDER (MANUAL).
 - THE INCOMING POWER SUPPLY AT ALL INTERMEDIATE SV STATIONS SHALL BE PROVIDED AT 11kV, 3-PHASE TWO POLE GALVANISED STRUCTURE SHALL BE PROVIDED FOR RECEIVING 11 kV SUPPLY. INSTALLATION, LAYING, TESTING & COMMISSIONING OF OVERHEAD CONDUCTOR FROM GRID SUPPLY TO TWO POLE STRUCTURE, SHALL BE DONE IN CO-ORDINATION WITH SEB MEETING REQUIREMENTS OF SEB AND IE REGULATIONS.
 - INTERLOCKING TIMERS FOR CYCLIC DUTY, OTHER HARDWARE AS REQUIRED TO BE PROVIDED IN FEEDERS FOR SPLIT AC, SUCH THAT ONE SPLIT AC OPERATES AT A TIME FOR 12 HOURS AND AFTER 12 HOURS, OTHER SPLIT AC OPERATES AND SO ON.
 - TRANSDUCERS FOR DIGITAL SIGNALS AND POTENTIAL FREE CONTACTS FOR ANALOGUE SIGNALS TO SCADA SHALL BE PROVIDED AS REQUIRED.
 - ALL SWITCH FUSE FEEDERS SHALL BE PROVIDED WITH ADDITIONAL CONTACT FOR REMOTE POWER SUPPLY INDICATION AT OWNER'S SCADA SYSTEM.
 - STATIC VOLTAGE REGULATOR SHALL BE PROVIDED WITH SPIKE ARRESTOR.
 - SEPARATELY MOUNTED, WEATHER PROOF WALL MOUNTED TYPE CONTROL PANEL FOR TUBE WELL PUMP SWITCH, FUSE, CONTACTOR, BIMETAL RELAY WITH SPP AMMETER, VOLTMETER, INDICATING LAMPS, AUTO/ MANUAL SWITCH WITH AUTO LEVEL CONTROL SHALL BE PROVIDED.
 - 48V DC CONTROL SUPPLY SHALL BE MADE AVAILABLE TO UNDERVOLTAGE RELAY AND APCR RELAY.
 - AS PER MOM DATED 29th JULY 2014, ON SEB SUPPLY EACH CHARGER MUST CHARGE THEIR OWN BATTERY AT 10% OF AH GIVEN FOR SMF LEAD ACID BATTERY AND ON DG/SOLAR SUPPLY EACH CHARGER MUST CHARGE THEIR OWN BATTERY AT 5% OF AH GIVEN FOR SMF LEAD ACID BATTERY.

- LEGENDS:
- DISCONNECT SWITCH (LINE INDICATES NO. OF POLES)
 - CABLE GLAND TERMINATION
 - DOUBLE SWITCH DISCONNECTOR-LOAD ISOLATING SWITCH WITH EARTHING POSITION
 - INDICATING LAMPS (R- RED (ON), G- GREEN (OFF), A- AMBER (TRIP))
 - PUSH BUTTON
 - MINIATURE CIRCUIT BREAKER
 - AMMETER SELECTOR SWITCH (FIGURE INDICATES QUANTITY)
 - MFM MULTI FUNCTION METER (FIGURE INDICATES QUANTITY)
 - TRANSFORMER
 - CONTACTOR (LINE INDICATES NO. OF POLES)
 - VSS VOLTMETER SELECTOR SWITCH (FIGURE INDICATES QUANTITY)
 - MCCB
 - AMF AUTO MAINS FAILURE
 - FUSE (LINE INDICATES NO. OF POLES)
 - T SYNCHRONOUS TIMER FOR CONTROL OF OUTDOOR LTG.
 - U/V RELAY (FIGURE INDICATES QUANTITY)
 - HT ISOLATOR
 - POTENTIAL TRANSFORMER (FIGURE INDICATES QUANTITY)
 - V VOLTMETER (FIGURE INDICATES QUANTITY)
 - 2 TIME DELAY RELAY (FIGURE INDICATES QUANTITY)
 - CAPACITOR
 - CURRENT TRANSFORMER (FIGURE INDICATES QUANTITY)
 - A AMMETER (FIGURE INDICATES QUANTITY)
 - 1 AUTO MANUAL SWITCH
 - GENERATOR
 - APCR AUTO POWER FACTOR CORRECTION RELAY (FIGURE INDICATES QUANTITY)
 - AVR AUTOMATIC VOLTAGE REGULATOR
 - LIGHTNING ARRESTOR

CLIENT: HINDUSTAN PETROLEUM CORPORATION LTD.
 Scope Minar, Laxmi Nagar
 Delhi- 110092 (India)

CONSULTANT: WORLEY PARSONS INDIA PVT. LTD.
 Raheja Plaza, First Floor,
 LBS Marg, Ghatkopar (W), Mumbai 400 086

CONTRACTOR: KSS PETRON PVT. LTD.
 1st Floor, Vatika Towers, A-Wing
 Sector-54, Gurgaon- 122002, India.

ENGINEERING SUB-CONTRACTOR: KAZSTROY ENGINEERING INDIA PVT. LTD.
 5th Floor, Vatika Towers, B-Wing
 Sector-54, Gurgaon- 122002, India.

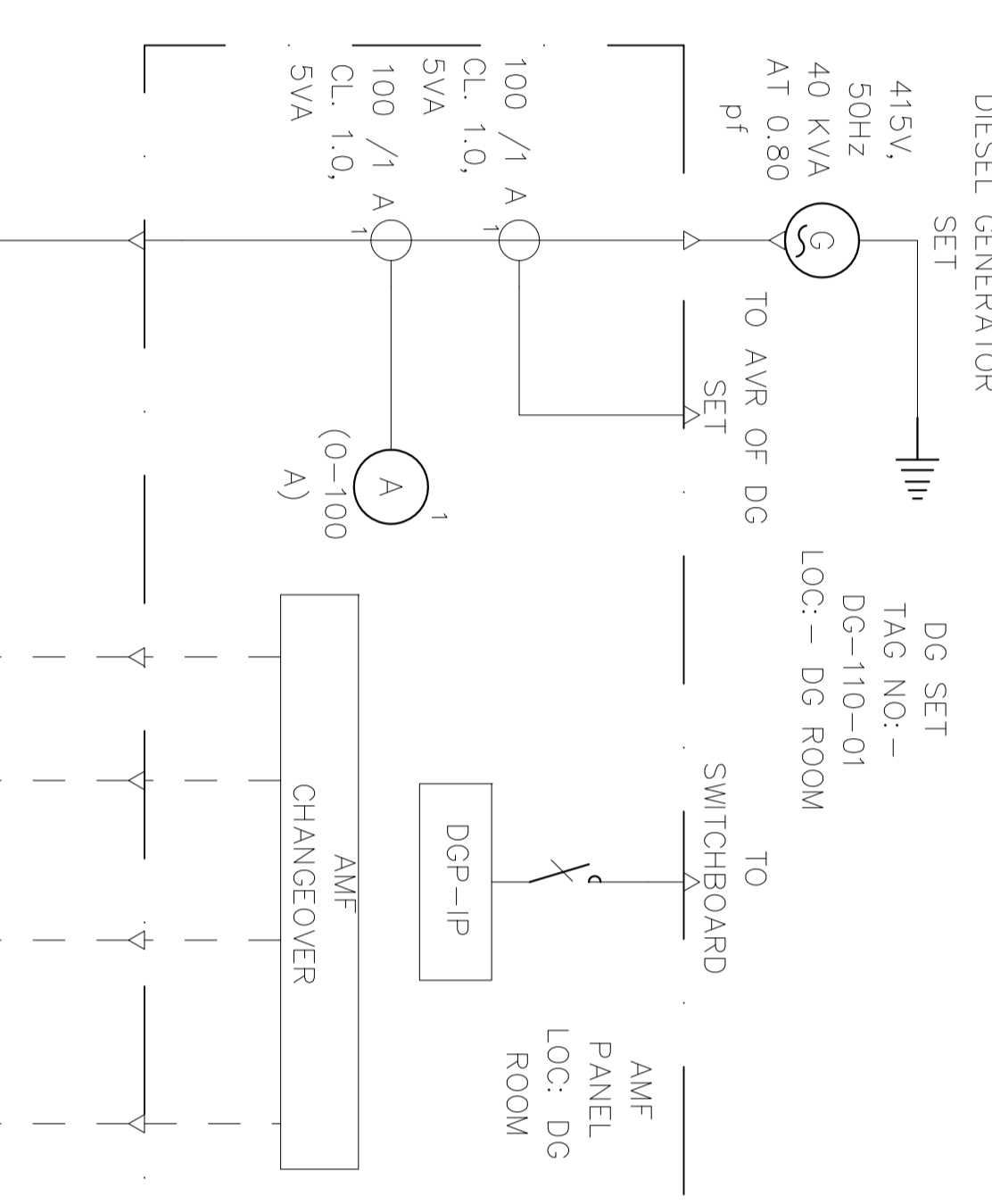
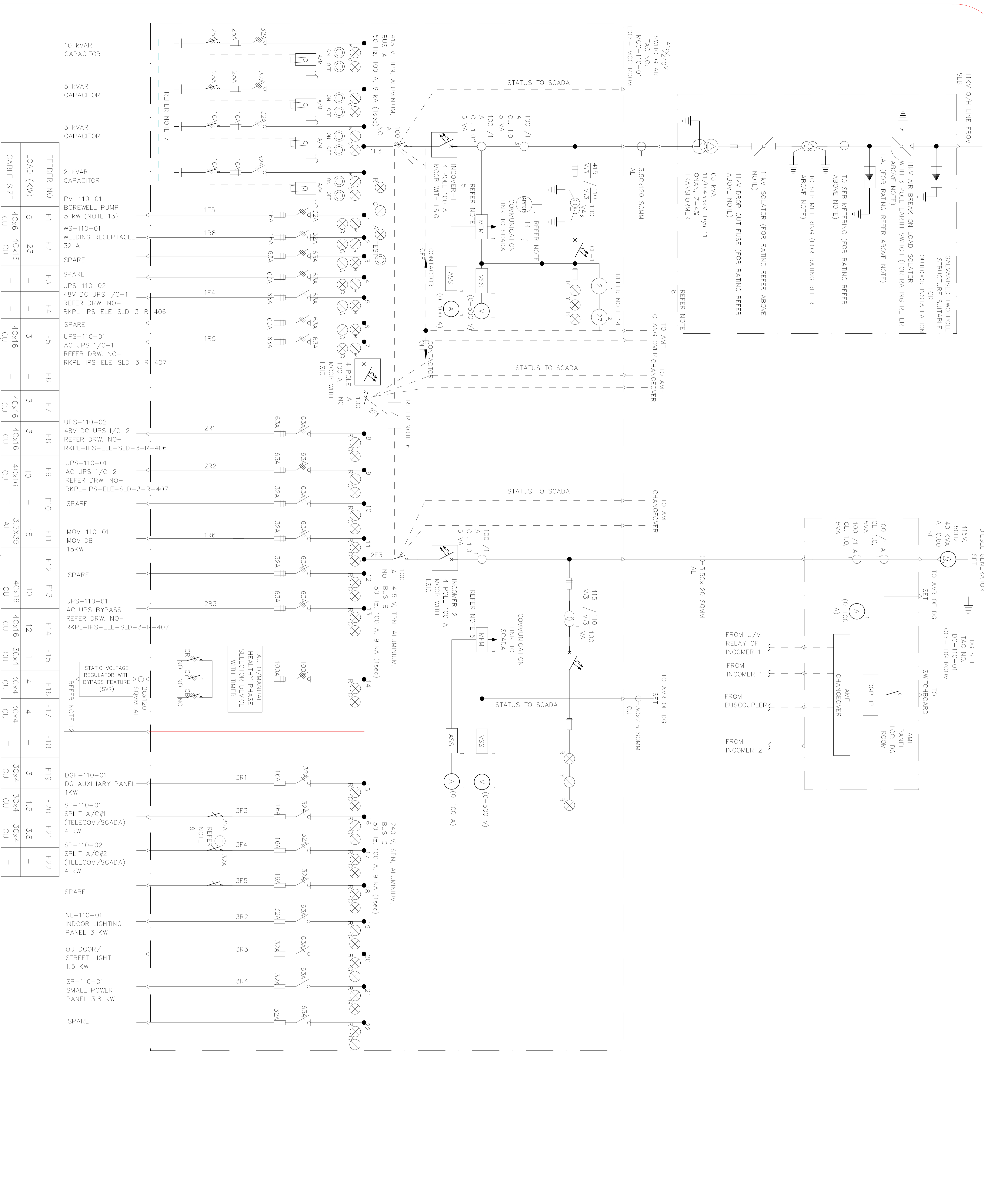
PROJECT: LAYING OF PIPELINE AND ASSOCIATED WORKS FOR REWARI-KANPUR PIPELINE PROJECT (PART-I AND PART-II)

DRAWING TITLE: 415 / 220V SINGLE LINE DIAGRAM
 TYPICAL FOR SV STATION 01,02,03,04,08,09,10 & 11

DRAWING NUMBER:	REFERENCE DRAWING	SHT.NO	REV.	DATE	DESCRIPTION	PRPD.	CHKD.	APRD.	APPROVED BY AND DATE	STATUS	SCALE:
MH2145-C000-EL-B00-0001	ELECTRICAL SYSTEM DESIGN BASIS	01	F	09.07.2014	RE-ISSUED FOR APPROVAL	SKS	SKS	CMS		-	NTS
		01	G	30.07.2014	RE-ISSUED FOR APPROVAL	SKS	SKS	CMS		-	NTS

FILE NAME	AREA	DRAWING NUMBER	SHEET NO.	REVISION
ELESLSVS04.00G	SVS0	RKPL-SVS-1,2,3,4,8,9,10,11-ELE-SLD-3-R-400	01	G

REFER NOTE-8



FEEDER NO	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20	F21	F22
LOAD (KW)	5	23	-	-	3	3	3	10	-	-	15	-	10	12	1	4	4	-	3	1.5	3.8	-
CABLE SIZE	40x6	40x16	-	-	40x16	-	40x16	40x16	40x16	-	35x35	-	40x16	40x16	30x4	30x4	30x4	-	30x4	30x4	30x4	-
	CU	CU			CU		CU	CU	CU		AL		CU	CU	CU	CU	CU		CU	CU	CU	

FEEDER NO	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20	F21	F22
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	CU	CU			CU		CU	CU	CU		AL		CU	CU	CU	CU	CU		CU	CU	CU	

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	CU	CU			CU		CU	CU	CU		AL		CU	CU	CU	CU	CU		CU	CU	CU	

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KSS PETRON PVT. LTD.
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PROJECT: LAYING OF PIPELINE AND ASSOCIATED WORKS FOR
REWAR-KANPUR PIPELINE PROJECT (PART-I) AND PART-II)

CLIENT: HINDUSTAN PETROLEUM CORPORATION LTD.
Scope Minar, Laxmi Nagar
Delhi-110092 (India)

CONSULTANT: WORLEY PARSONS
resources & energy
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ISSUE RECORD

NO.	DESCRIPTION	DATE	BY	APPROVED BY
1	AS BUILT	24.02.2016		
0	ISSUED FOR CONSTRUCTION	11.11.2014		
D	RE-ISSUED FOR APPROVAL	10.10.2014		
C	ISSUED FOR APPROVAL	18.09.2014		

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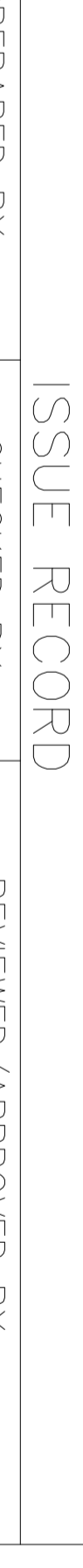
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LEGENDS



NOTES:

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- WORKING PHILOSOPHY
 - DURING NORMAL OPERATION, INCOMER 1 AND BUSCOUPLER ARE CLOSED AND INCOMER 2 IS OPEN SO THAT NORMAL POWER IS FED TO ALL LOADS.
 - IN CASE OF UNDER VOLTAGE OF DG SET SHALL INITIATE STARTING OF DG SET AND SIMULTANEOUS OPENING/TRIPPING OF INCOMER-1 & BUSCOUPLER AFTER FULL VOLTAGE BUILD-UP, THE INCOMER 2 SHALL CLOSE AND LOADS ON BUS B SHALL BE FED FROM DG SET. ALL CONTROLS SHALL BE THROUGH PLC UNDER VOLTAGE ON INCOMER 1 IS CONSIDERED ONLY WHEN LINE PT MCB IS NOT TRIPPED. U/V RELAY IS OPERATED AND CONTACTOR 3) OF BUSCOUPLER PARALLELING IS ENHANCED.
 - INTERLOCK SHALL BE PROVIDED BETWEEN INCOMER 1, BUSCOUPLER & INCOMER 2 SUCH THAT INCOMER 2 CAN BE CLOSED PROVIDED INCOMER 1 & BUSCOUPLER ARE OPEN.
 - WHEN NORMAL POWER SUPPLY RESUMES INCOMER 2 SHALL BE OPENED MANUALLY & THEN INCOMER 1 AND BUSCOUPLER SHALL BE CLOSED MANUALLY.
- AUTO MANUAL SWITCH SHALL BE PROVIDED ON CAPACITOR FEEDER TO CONTROL EITHER FROM AUTO (AUTO) OR FROM PUSH BUTTONS ON FEEDER (MANUAL).
- THE INCOMING POWER SUPPLY AT ALL INTERMEDIATE SV & IP STATIONS SHALL BE PROVIDED AT 11kV.3-PHASE TWO POLE GALVANISED STRUCTURE SHALL BE PROVIDED FOR RECEIVING 11 kV SUPPLY. INSTALLATION, LAYING, TESTING & COMMISSIONING OF OVERHEAD CONDUCTOR FROM GRID SUPPLY TO TWO POLE STRUCTURE SHALL BE DONE IN CO-ORDINATION WITH SEB MEETING REQUIREMENTS OF SEB AND IE REGULATIONS.
- INTERLOCKING TIMERS FOR CYCLIC DUTY, OTHER HARDWARE AS REQUIRED TO BE PROVIDED IN FEEDERS FOR WINDOW AC, SUCH THAT ONE WINDOW AC OPERATES AT A TIME FOR 12 HOURS AND AFTER 12 HOURS, OTHER WINDOW AC OPERATES AND SO ON.
- TRANSFORMERS FOR DIGITAL SIGNALS AND POTENTIAL FREE CONTACTS FOR ANALOGUE SIGNALS TO SCADA SHALL BE PROVIDED AS REQUIRED.
- ALL SWITCH FUSE FEEDERS SHALL BE PROVIDED WITH ADDITIONAL CONTACT FOR REMOTE POWER SUPPLY INDICATION AT OWNERS SCADA SYSTEM.
- STATIC VOLTAGE REGULATOR SHALL BE PROVIDED WITH SPIKE ARRESTOR.
- SEPARATELY MOUNTED, WEATHER PROOF WALL MOUNTED TYPE CONTROL PANEL FOR TUBE WELL PUMP HAVING SWITCH, FUSE, CONTACTOR, METAL RELAY WITH SP4 AMMETER, VOLTMETER, INDICATING LAMPS, AUTO/MANUAL SWITCH WITH AUTO LEVEL CONTROL SHALL BE PROVIDED.
- 48V DC CONTROL SUPPLY SHALL BE MADE AVAILABLE TO UNDERVOLTAGE RELAY AND AFRG RELAY.
- ALL THE 11KV RELEVANT ITEM AND LA RATINGS TO BE FURNISHED AS PER SEB AND IE RULES.

FILE NAME

AREA

DRAWING NUMBER

SHEET NO.

REVISION

415V SINGLE LINE DIAGRAM FOR IP STATION

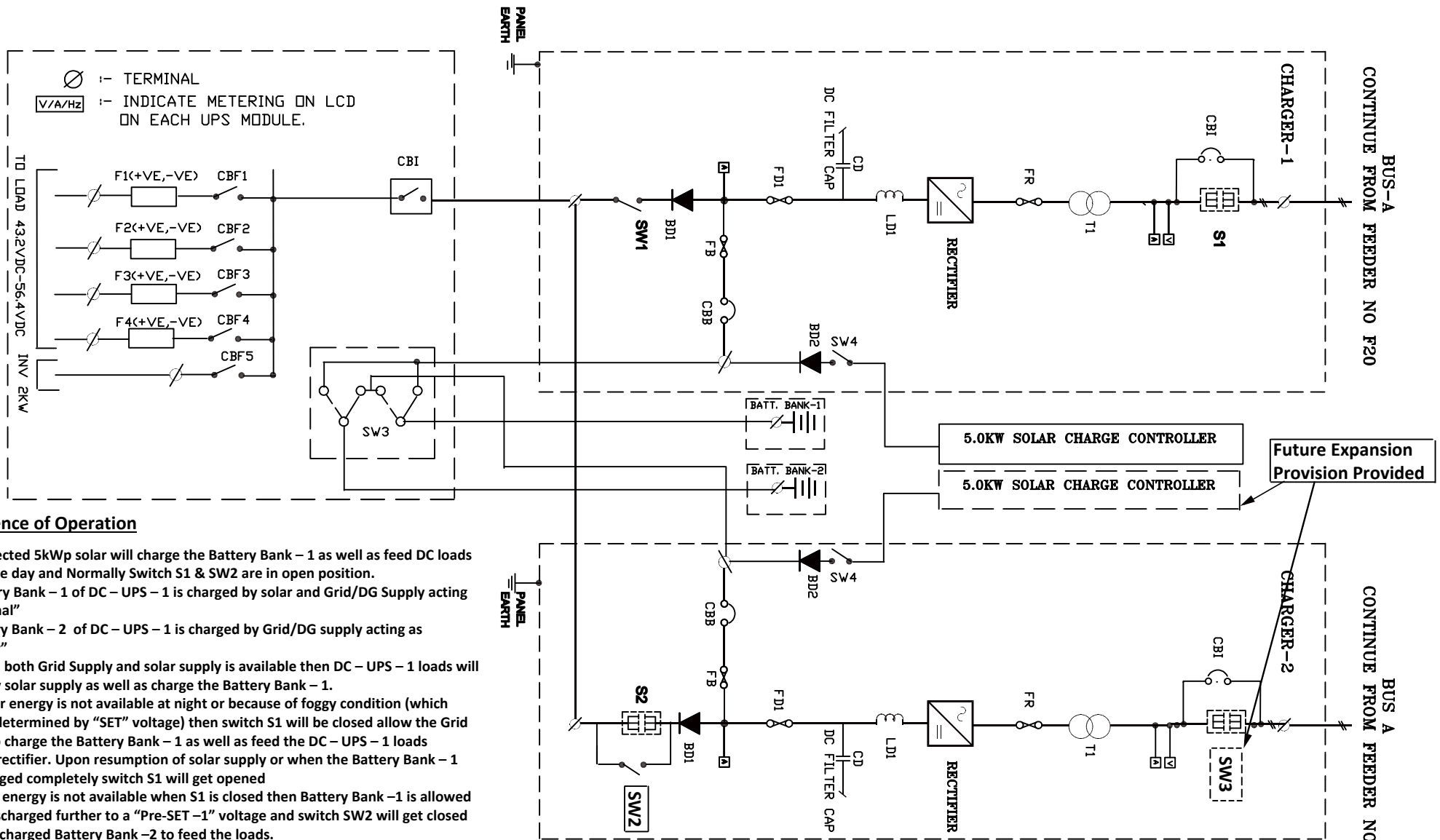
IPS

RKPL-IPS-SP-ELE-SLD-3-R-400

01

1

Final SLD of Solar power Generating System with sequence of operation at SV-05, SV-06 & SV-07 Stations



Sequence of Operation

- Connected 5kWp solar will charge the Battery Bank – 1 as well as feed DC loads during the day and Normally Switch S1 & SW2 are in open position.
- Battery Bank – 1 of DC – UPS – 1 is charged by solar and Grid/DG Supply acting as “Normal”
- Battery Bank – 2 of DC – UPS – 1 is charged by Grid/DG supply acting as “Standby”
- When both Grid Supply and solar supply is available then DC – UPS – 1 loads will be fed by solar supply as well as charge the Battery Bank – 1.
- If solar energy is not available at night or because of foggy condition (which shall be determined by “SET” voltage) then switch S1 will be closed allow the Grid supply to charge the Battery Bank – 1 as well as feed the DC – UPS – 1 loads through rectifier. Upon resumption of solar supply or when the Battery Bank – 1 gets charged completely switch S1 will get opened
- If Grid energy is not available when S1 is closed then Battery Bank – 1 is allowed to get discharged further to a “Pre-SET-1” voltage and switch SW2 will get closed allowing charged Battery Bank – 2 to feed the loads.
- If Grid or solar resumes then SW2 gets opened. Else Battery Bank – 2 continue to feed the load. Upon reaching “Pre-SET-2” voltage, control circuit will activate a “PFC” which can be configured to trigger external DG. Upon DG getting ON switch SW2 gets opened allowing “stand by” battery not to get discharged further and make “Normal” Battery Bank – 1 to feed the load.
- If DG fails to start then an “Alarm (PFC)” gets activated which request for human intervention.
- All the above operations are fully automatic. “Manual By pass” switch is provided across S1, & SW2 to override “Auto” operation
- 2kVA inverter provided in DC – UPS – 1 will take care of emergency lighting loads.
- The above sequence of operation is applicable of DC – UPS – 2 too.



ATC

Sl.No.	Description	Attached File	Set Value	Supporting Doc. Req'd
1	ACKNOWLEDGEMENT :- WE HEREBY ACKNOWLEDGE RECEIPT OF SUBJECT E-TENDER AT https://etender.hpcl.co.in FOR OUR USE IN PREPARING THE BID.WE UNDERTAKE THAT THE CONTENTS OF THE ABOVE BIDDING DOCUMENT AT https://etender.hpcl.co.in SHALL BE KEPT CONFIDENTIAL AND FURTHER THAT THE DRAWINGS, SPECIFICATIONS AND DOCUMENTS SHALL NOT BE TRANSFERRED AND THAT THE SAID DOCUMENTS ARE TO BE USED ONLY FOR THE PURPOSE FOR WHICH THEY ARE INTENDED.		None	No
2	COMPLIANCE TO BID REQUIREMENT:-WE HEREBY AGREE TO EACH & EVERY WORD/LINE FORMING PART OF THIS TENDER DOCUMENT AND ADDENDUM OR CORRIGENDUM TO THE BIDDING DOCUMENT. WE HAVE ALSO CHECKED e TENDER MESSAGE BOARD AND QUERY REPLIES ISSUED BY HPCL AND THE SAME HAS BEEN CONSIDERED IN OUR OFFER. HOWEVER, IF THERE ARE ANY DEVIATIONS TECHNICAL/COMMERCIAL/GENERAL RAISED BY US AGAINST THIS TENDER, THE SAME SHALL BE MENTIONED UNDER DEVIATION ,IF APPLICABLE . WE ALSO DECLARE THAT DEVIATIONS MENTIONED BY US ANYWHERE ELSE SHALL BE NULL & VOID. WE FURTHER CONFORM THAT THE PERSON SUBMITTING THIS BID ON LINE IS AUTHORIZED TO SUBMIT THE BID. (say: CONFIRM)		None	No
3	(M/s. (Please fill Party's name _____)) hereby declare / clarify that we have not been banned or delisted by any government or quasi Government agencies or Public Sector Undertakings. NOTE : If a bidder has been banned by any Government or quasi Government agencies or PSUs, this fact must be clearly stated with details. If this declaration is not given along with the unpriced bid, the tender will be rejected as non-responsive.		None	No
4	NAME OF THE COMPANY/PARTY		None	No
5	POSTAL ADDRESS		None	No
6	NAME OF THE AUTHORISED CONTACT PERSON		None	No
7	Mobile No. of the Authorised Contact person		None	No
8	TELEPHONE NO.		None	No
9	FAX NO. OF THE BIDDER		None	No
10	WHETHER REGISTERED WITH NSIC : YES / NO		None	No
11	WHETHER COPY OF NSIC CERTIFICATE ENCLOSED : YES /NO (Please upload NSIC CERTIFICATE HERE,In case applicable)		None	Allowed
12	WHETHER REGISTERED AS MICRO SMALL ENTERPRISE (MSE) : YES / NO.		None	No
13	If registered as MSE,upload MSE certificate		None	Allowed
14	GSTIN REGISTRATION STATUS IN INDIA: REGISTERED BIDDER OR UN-REGISTERED BIDDER OR REGISTRATION UNDER COMPOSITION SCHEME		None	No
15	Please provide the GSTIN of the state using which the bidder will be raising the bills		None	No
16	DETAILS OF BUILT-IN-CIF VALUE, IMPORT CONTENT & CUSTOM DUTY ,upload detail in format provided in tender,In case of NIL /N.A. please mention the same.		None	Allowed
17	PLEASE UPLOAD YOUR PAN CARD FOR E-PAYMENT		None	Mandatory
18	PLEASE UPLOAD YOUR GSTIN certificate FOR E-PAYMENT		None	Mandatory
19	Please provide the copy of Power of Attorney in favour of person digitally signing the bid		None	Mandatory
20	Whether any of the Directors of Vendor is relative of any Director of Owner or the Vendor is a firm in which any Director of Owner or his relative is a Partner or the Vendor is Private Company in which any Director of Owner is a member or Director. (SAY YES or NO)		None	No
21	Upload duly filled and signed Annexure-A,B,C and D as given in Sr. No. 4		None	Mandatory
22	Referring to Govt circular regarding imposing restrictions on procurements -imports from countries sharing land border with India, on the grounds of Defence of India and National Security with immediate effect. Please provide DECLARATION FOR NOT SHARING LAND BORDER WITH INDIA as per attached format at sr no. 5		None	Mandatory
23	Please upload declaration on your letter head for Bid security		None	Mandatory
24	Common annexure	ANNEXURE A-D.pdf	-	No
25	Affidavit for original document	affidavit for original doc verification.pdf	-	No
26	EMD declaration	Declaration instead of EMD.pdf	-	No
27	Bordar sharing	No land border sharing declaration.pdf	-	No

ANNEXURE-A

DECLARATION (NOT BANNED)

(To be submitted along with Un-priced bid)

(M/s. _____) hereby declare / clarify that we have not been banned or delisted/blacklisted or Put on holiday by Government of India / Ministries of Government of India/Government of India Enterprises.

Stamp and Signature of Bidder

Note:

This Declaration should be on the letterhead of the Bidder and should be signed by a person competent and having the power of attorney to bind the Bidder.

ANNEXURE-B

BIDDER'S GENERAL INFORMATION

To
HPCL Pipelines Department,
Hindustan Bhavan P&P HQO-HB1 ,No 8, SV Marg,
Ballard Estate
Mumbai - 400001

Bidder Name:

Number of Years in Operation : _____

Registered Address : _____

Contact Person's Name : _____

Operation Address
if different from above : _____

Telephone Number : _____
(Country code) (Area Code) (Tel. Number)

E-mail address & Web Site : _____

Telefax Number : _____
(Country Code) (Area Code) (Tel. Number)

ISO Certification, if any (if yes, please furnish details)

(SIGNATURE OF BIDDER WITH SEAL)

ANNEXURE-C

To,
HPCL Pipelines Department,
Hindustan Bhavan P&P HQO-HB1 ,No 8, SV Marg,
Ballard Estate
Mumbai - 400001

The following confirmation / updation of my Bank Account Details and I hereby affirm my/our choice to opt for payment of amounts due to me under various contracts through electronic mode. I understand that Hindustan Petroleum Corporation Limited also reserves the right to send the payment due to me by a Cheque / Demand Draft / Electronic Mode or through a banker.

Supplier / Contractor Name	
Supplier / Contractor Code	
Address	
Controlling Office Name	Marketing Projects Office
P.A. No.	
E-mail ID	
Bank Name	
Branch Name	
Branch Address	
MICR No.	
Account Type	
Account Number	
IFSC Code of the Branch (For RTGS)	
IFSC Code of the Branch (For NEFT)	

I hereby confirm that the particulars given above are correct and complete and also undertake to promptly advise any changes to the above details to HPCL. If the transaction is delayed or not effected for reason of incomplete or incorrect information or banking delays, I shall not hold Hindustan Petroleum Corporation Limited responsible. I also agree for printing of the bank details on the Cheque or DD if the payment is effected by Cheque / DD.

Date:

(Signature of Contractor / Supplier)

Note:

1. The message should be on Companies Letter Head.
2. Bank details to be confirmed by the Bankers. Such information shall be duly signed & stamped by the Bankers.
3. Please enclose cancelled / photocopy of a Cheque.

ANNEXURE-D

BID FORM

To: (Name and address of Owner/Consultant)

Date:

Gentlemen,

Having examined the Conditions of Contract and Specifications of tender document including Addendum(s) / Corrigendum(s) in respect **of Supply & Install Solar Panels** the receipt of which is hereby duly acknowledged, we the undersigned, offer to supply and delivery (Description of Goods and Services) in conformity with the said Drawings, Conditions of Contract and specifications for the same (total bid amount in words and figures) or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this bid.

We undertake if our bid is accepted, complete delivery as agreed and specified in the RFQ document. If our bid is accepted we will obtain the guarantee of a Bank in a sum not exceeding (10)% of the Contract price for the due performance of the Contract.

We agree to abide by this bid for a period of **90 days (for LIMITED Tender)** from the date fixed for bid opening under Instructions to Bidders and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal contract is prepared and executed, this bid, together with your written acceptance thereof in your notification of award (Fax of Intent) shall constitute a binding Contract between us.

We understand that you are not bound to accept the lowest or any bid, you may receive.

Dated this

Day of

Signature

.....

In the capacity of duly authorized to sign bid for an on behalf of

Witness

Address

Signature

ANNEXURE - M

**FORMAT FOR AFFIDAVIT REGARDING ORIGINAL DOCUMENT VERIFICATION TO BE PROVIDED
ON E-STAMP PAPER**

To,
Hindustan Petroleum Corporation Limited
Mumbai

SUB:

TENDER NO:

Dear Sir,

We hereby confirm that we(Name of the bidder) would get all the original documents verified before PO placement within time line given by HPCL, failing which our bid would be rejected and the case would be treated as a case of misrepresentation of the facts and action would be initiated as per tender terms / HPCL policy.

For and on behalf of (Name of firm/entity)

Authorized signatory (to be authorized by the Board of Directors)

< Insert Name, Designation and Contact No.>

(To be submitted on Letter head / emblem)

BID SECURITY DECLARATION (IN LEIU OF EARNEST MONEY DEPOSIT)

Ref : Tender No

Date

Sub : Tender title _____

I, Shri _____ of M/s. _____, having its registered office at _____, in my capacity as _____ (*Role of the Bidder – Proprietor/Partner/Director etc.*) and being authorized for the purpose, declares on behalf of the Bidder as under:

- 1) That M/s. _____ are participating in the subject tender and have submitted our bid in response to the same.
- 2) That we understand that in compliance with the Ministry of Finance Office Memorandum bearing Reference F.9/4/2020-PPD dated 12.11.2020 and Office Memorandum bearing reference DPE/7/(4)/2017-Fin(Part-I) dated 19.11.2020 issued by Department of Public Enterprises, the Owner has decided not to ask for furnishing of Earnest Money Deposit (EMD) in the form of Bid Security till the operation of the said Office Memorandum.
- 3) That in lieu of not furnishing the EMD, we hereby declare that :
 - a) We will display our commitment to abide by our bid during the tender evaluation process and will not withdraw or modify it or impair or derogate from it in any respect during its validity period i.e. _____ number of days from the date of opening of the Unpriced Bid as sought in the Notice inviting Tender.
 - b) We will comply with all formalities of signing of the contract/agreement/purchase order and submit performance security within time stipulated in the tender document.
 - c) On our failure to ensure (a) and (b) above, HPCL being the Owner shall be entitled to put us under suspension for its future tenders or ban/blacklist us for a specified period as per its policy. The discretion and decision of HPCL in this regard will be final.
 - d) We will comply with all other formalities which HPCL will communicate to us during the bid validity period.

- 4) The executant and signatory of this Declaration is authorized by the bidder and the bidder undertakes to comply and abide by the above declaration.

Date

Signature _____

Place

Stamp / seal

UNDERTAKING ON LETTERHEAD

To,
M/s HPCL

SUB:
TENDER NO:

Dear Sir

We have read the clause regarding Provisions for Procurement from a Bidder which shares a land border with India, we certify that, bidder M/s_____ (*Name of Bidder*) is :

- (i) Not from such a country []
- (ii) If from such a country, has been registered with the Competent Authority. []
(Evidence of valid registration by the Competent Authority shall be attached)

(Bidder is to tick appropriate option (✓ or X) above).

We hereby certify that bidder M/s_____ (*Name of Bidder*) fulfills all requirements in this regard and is eligible to be considered against the tender.

Place: [Signature of Authorized Signatory of Bidder]
Date: Name:
Designation:
Seal:

**CERTIFICATE FOR TENDERS FOR WORKS INVOLVING POSSIBILITY OF SUB-
CONTRACTING**

To,

M/s HPCL

SUB:

TENDER NO:

Dear Sir

We have read the clause regarding Provisions for Procurement from a Bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; we certify that, bidder M/s_____ (*Name of Bidder*) is:

(i) not from such a country []

(ii) if from such a country, has been registered with the Competent Authority. []

(Evidence of valid registration by the Competent Authority shall be attached)

(Bidder is to tick appropriate option (✓ or X) above).

We further certify that bidder M/s_____ (**Name of Bidder**) will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority.

We hereby certify that bidder M/s_____ (**Name of Bidder**) fulfills all requirements in this regard and is eligible to be considered.

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal: