

	FIELD QUALITY PLAN				No:	REG2021-20200333
	Project:	Solar Based EV charger	Customer :	DHI-IOCL- Petrol Pump	Rev	00
Rudrapur	GROUP : Renewable Energy Group (REG)				Date	27.10.2020

FIELD QUALITY PLAN

00	10.02.2020	Dinesh Kumar	Alok Kumar	Ayan Debbarma	
Rev	Date	Altered	Checked	Approved	Note

BHEL CFP Rudrapur

	FIELD QUALITY PLAN				No:	REG2021-20200333
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Authorization of Check

Category of Check	Inspection Authority	Witness Authority	Nonconformity (if any) Disposition Authority	Accepting Authority
A' (Customer Hold Point)	BHEL Engineer	BHEL/OE	BHEL ENGG Centre / Head (Quality): BHEL CFP	BHEL
B' (Formal intimation Engineer shall be forwarded by BHEL. Check shall commence at notified time whether parties show-up or not)	BHEL Engineer	BHEL/OE	BHEL ENGG Centre / Head (Quality): BHEL CFP	BHEL
C'	BHEL Engineer	BHEL Engineer	BHEL ENGG Centre / Head (Quality): BHEL CFP	BHEL

Abbreviations used:

HOS - Head of Section

OE- Owner's Engineer

Note:

1. Nonconformity Disposition authority for all categories of checks shall be as under: Product nonconformities: BHEL Engineering Centre. Process/ System nonconformities: Head (Quality): BHEL, CFP.
2. Wherever log sheet is not called for, suitable record shall be maintained in protocol I Site register.
3. In case of nonconformity, accepting authority will consider the solution for the nonconformity as proposed by the Nonconformity Disposition Authority before acceptance, and such solution shall be reflected in the log sheets/protocols.
4. Quantum of check shall be 100% for all characteristics unless otherwise mentioned specifically in Field Quality Plan/ reference documents.
5. Only authorized persons with proper safety gears to enter construction area.

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BHEL CFP Rudrapur

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Rudrapur	GROUP : Renewable Energy Group (REG)				Date	27.10.2020

STATEMENT OF CHECKS

Capacity / Type: 15/20 KWp
System: Solar Based EV charger at IOCL- Petrol Pump
Sub-System: **SPV MODULES, SOLAR STRING INVERTER, CABLE DC, LT-ACDB/ACCB, EARTHING**

NOTES:

- Abbreviations used
Type of Checks:
V- Visual,
V&E- Visual and Electrical,
E- Electrical
P- Physically,
SL- Spirit Level
- Latest revision of Standards & Specification shall apply.
- Gauges and measuring Instruments, with valid calibration only shall be used
- Format of record identified with "tick" (✓) mark in column no. 'D*' shall be essentially included in QA documentation.

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 BHARAT HEAVY ELECTRICALS LIMITED CFP- RUDRAPUR		FIELD QUALITY PLAN FOR SPV MODULES STATEMENTS OF CHECKS						FQP NO.: FQP/RTS/SSPV/01 BHEL Doc. NO. : RU:REG:FQP01	
SYSTEM: ROOF TOP SOLAR SYSTEM		SUB-SYSTEM: SPV MODULES						REV. NO. : 00 TOTAL SHEETS: 02	
AREA:									
SL NO.	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS OF CHECK	QUANTUM/FREQUENCY OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF RECORD	REMARKS
1	2	3	4	5	6	7	8	9	10
A Material Receipt and Unloading									
A.01	Unloading From Truck	V	Hydra Crane	C	100%		Use Proper material handing equipment	Logbook/ Site register	
A.02	Verification of qty and identification	V	Visual	C	100%	Delivery Challan / Packing List	Correlation of the received with dellavery challan/packing list	Site Material register	
A.03	Reporting of damage/missing items	V	Visual	C	100%		Delivery Challan / Packing List	Site Material register	
B Shifting of (Modules)									
B.01	Any one point is sufficient	V	Hydra Crane/ Manually	C	100%		Use Proper material handing equipment	Logbook/ Site register	
B.02	Storage Space	V	Visual	B	100%		Protection of rain, why not indoor?	Logbook/ Site register	
B.03	Pallet Stack Height	V	Visual	C	100%	Maximum Stack Height 2 pallets	Maximum stack Height 2 pallets	Logbook/ Site register	
C Pre-Erection									
C.01	Document availability	V	Visual	C	100%	BHEL approved layout drawing/data sheet	BHEL approved layout drawing/data sheet	MoM/ e-mails	
C.02	Civil work & MMS Structure	V	Visual	C	100%	BHEL approved drawings/data Sheet	Check the completion of MMS foundation and completion of MMS assembly	Logbook/ Site register	
C.03	Fixing hardware availability	V	Visual	C	100%	Manufacturer Installations Manual/ BHEL approved Drawing/data sheet	Manufacturer Installations Manual / BHEL approved Drawing/data sheet	Logbook/ Site register	
C.04	Unpacking of pallets and module handing	V	Visual	C	100%		Manually shifted at the rooftop	Logbook/ Site register	
D Erection									
D.01	Fixing of modules to MMS using Fasteners	V	Manually/ Torque wrench	C	100%	Manufacturer Installations Manual/ BHEL approved PV module data sheet	1) Each module should be supported on the MMS 2) Each Modul should be mounted with Fasteners on MMS at 4 locations	Logbook/ Site register	

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 BHARAT HEAVY ELECTRICALS LIMITED CFP- RUDRAPUR		FIELD QUALITY PLAN FOR SPV MODULES STATEMENTS OF CHECKS						FQP NO.: FQP/RTS/SSPV/01 BHEL Doc. NO.: RU-REG:FQP01	
								REV. NO.: 00	
								TOTAL SHEETS: 02	
SYSTEM: ROOF TOP SOLAR SYSTEM		SUB-SYSTEM: SPV MODULES							
		AREA:							
1	2	3	4	5	6	7	8	9	10
SL NO.	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS OF CHECK	QUANTUM/ FREQUENCY OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF RECORD	REMARKS
D.02	Module series wiring	V	Manually	B	100%	BHEL approved SLD /Data sheet	1)Ensure right Polarity. 2) Number of modules in series Loop Should match SLD 3) No loose Connection allowed No Short Circuiting of modules allowed	Logbook/ Site register	
D.03	Grounding	V & E	Manually	C	100%	Each Individual module frame should be grounded through the Fasteners connecting PV module to MMS and subsequent earthing by using Suitable Size Cu Wires/GI Strip	BHEL approved layout drawing	Logbook/ Site register	
E Pre Commissioning									
E.01	Voc measurement	E	Megger/IR Tester/ Clamp meter	A/B	100%	BHEL approved data sheet	1) String Voc Should match with SLD requirement and data sheet 2) No reverse polarity allowed	Joint Protocol	

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BHARAT HEAVY ELECTRICALS LIMITED CFP- RUDRAPUR		FIELD QUALITY PLAN FOR SOLAR STRING INVERTER STATEMENTS OF CHECKS						FGP NO.: FGP/ITS/STRING Inverter/01 BH&L Doc. NO.: RU-BEG-FQPM03 REV. NO.: 00 TOTAL SHEETS: 01 AREA:	
SYSTEM: ROOF TOP SOLAR SYSTEM		SUB-SYSTEM: SOLAR STRING INVERTER						FORMAT OF RECORD	
SL NO.	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS OF CHECK	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	9	10
A Material Receipt and Unloading									
A.01	Unloading From Truck	V	Manually/ Hydra Crane	C	100%	Manufacturers instruction Manual	Use proper material handling equipment with proper safety precautions.	Log book/Site register	
A.02	Verification of qty and specification & Identification	V	Visual	C	100%	Purchase order, delivery challan & packing list.	Correlation of the lot received with purchase order, delivery challan & packing list.	Site material register	
A.03	Packing Inspection	V	Visual	C	100%	Manufacturers instruction Manual	Package should be in good condition i.e. without breakage or visual defects. Should not be in opened condition.	Site material register	
A.04	Reporting of damage/missing items	V	Visual	C	100%	Delivery challan & packing list.	Delivery challan/Packing List.	Site material register/e-mails	
B Storage of Inverters									
B.01	Storage space	V	Visual	B	100%	Manufacturer installation manual	All inverters must be placed indoor.	Site material register	
B.02	Handling and Movement	V	Manually/ Hydra Crane	C	100%	Manufacturer installation manual	Store in such a way which avoid direct mechanical hit with sharp objects and also store in such a way that easy material movement access possible.	Site material register	
C Pre-Installation & checking									
C.01	Document availability/ tools availability	V	Manually	C	100%	BHEL approved drawing/ Manufacturer's Instruction Manual	Document availability/tools availability	Log book/Site register	
D Installation									
D.01	Fix the inverter mounting plate on the stand with nut and bolts and tighten properly.	V	Screw driver set/ Drill machine	C	100%	Manufacturer's instruction manual	Manufacturers instruction manual	Log book/Site register	
D.02	Lift the string inverter manually and position the inverter in place on the stand	V	Manually	C	100%	Manufacturer's instruction manual	Manufacturers instruction manual	Log book/Site register	
D.03	All DC power input connections, AC power output connections & communications as per manufacturer manual.	V	Manually	C	100%	Manufacturer's instruction manual	Cable size as per Manufacturers instruction manual/BHEL Approved drawings.	Log book/Site register	
D.04	All earthing connections should be as per refer manufacturer manual.	V	Manually	C	100%	Manufacturer's instruction manual	Manufacturer's instruction manual	Log book/Site register	
E Pre-Commissioning									
E.01	Ensure that all the cables connections are properly tightened.	V	Manually	C	100%	Manufacturer's instruction manual	Manufacturer's instruction manual	Log book/Site register	
E.02	Check rating of source and the cable terminations.	V	Manually	C	100%	Manufacturer's instruction manual	Manufacturer's instruction manual	Log book/Site register	
E.03	All DC output power conductors from inverter to external transformer are properly sequenced and tightened.	V	Manually	C	100%	Manufacturer's instruction manual	Manufacturer's instruction manual	Log book/Site register	
E.04	Check P/N/V	E	Megger/IR Tester	C	100%	Manufacturer's installation manual	Manufacturer's installation manual	Joint Protocol	

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 BHARAT HEAVY ELECTRICALS LIMITED CFP- RUDRAPUR		FIELD QUALITY PLAN FOR SOLAR DC CABLE STATEMENTS OF CHECKS						FQP NO.: FQP/RTS/Cable/01 BHEL Doc. NO.: RU-REG-FQP01 REV. NO.: 00 TOTAL SHEETS: 01	
SYSTEM: ROOF TOP SOLAR SYSTEM		SUB-SYSTEM: CABLE						AREA:	
SL NO.	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS OF CHECK	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF RECORD	REMARKS
1	2	3	4	5	6	7	8	9	10
A Material Receipt and Unloading									
A.01	Unloading From Truck	V	Manually/ Hydra Crane	C	100%		Use Proper Material handling equipment	Site Material register	
A.02	Verification of qty and identification	V	Visual	C	100%	Delivery Challan / Packing List	correlation of the lot received with delivery challan / packing list.	Site Material register	
A.03	Packing inspection	V	Visual	C	100%		Cable spools should be in good condition i.e. without breakage of visual defects should not in opened condition.	Site Material register	
A.04	Reporting of damage/missing items	V	Visual	C	100%		Delivery Challan / Packing List	Site Material register/ e-mails	
B Storage of Cables									
B.01	Movement to rooftops	V	Manually	C	100%		Use Proper Material handling equipment	Site Material register	
B.02	Storage space	V		B/C	100%		The storage area should be non flooded, All cables preferably store on original spools itself to avoid damage on Rooftops under the Roof area dry secure / manufacturer installation	Site Material register	Storage space should be dry
B.03	Handling and Movement	V	Manually	C	100%		Cable Store in such a way which avoid direct mechanical hit with sharp objects and also store in such a way that easy material movement access possible	Site Material register	
C Pre-Erection									
C.01	Document availability	V	Manually	C	100%	BHEL approved Layout drawings	BHEL approved Layout drawings	Log book/Site register	
C.02	Continuity	E	Multimeter	C	100%	BHEL Spec	Continuity should be checked through out cable before usage	Log book/Site register	
D Erection									
D.01	PV Cable erection solar PC connector assembly and Solar PV module wiring	V	Manually	C	100%	BHEL approved Layout drawings	As per BHEL approved Layout drawings	Log book/Site register	
D.02	IR test on cable from PV array to string inverter (between conductor and earth)	E	Megger/IR Tester	C/B	100%	Manufacturer installation manual	Manufacturer installation manual	Joint Protocol	

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