| | |
|---|---|
| **TSS project No.:** | nnnnn |
| **Client:** | name |
| **Client PO. No. / date:** | No / dd.mm.yyyy |
| **TSS document No.:** | DOCUMENT1 |

| Rev | Date | Description | Prepared | Checked |
|---|---|---|---|---|
| 00 | 2021-07-29 | Initial | JvV (SRO/IJA) | JWL |



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# Contents

# 1 Safety

Take the required safety precautions according the local regulations before starting the test.

# 2 General Information

This document elaborates the activities that are carried out during the Site Acceptance Test (SAT). It also intended to register the outcomes of the activities and validate the functional requirements of the Solar Energy System (SES).

Visual inspection and functional performance validation will be carried out on the complete installed SES, PV modules and battery cells included.

## 2.1 Reference documents

The following reference documents are required during the SAT:

| Document No. | Rev. | Document title |
|---|---|---|
| | | Foundation layout |
| | | General arrangement |
| | | Project datasheet |
| | | Single line diagram |
| | | Wiring diagram solar array |
| | | Circuit diagram sub array junction box |
| | | Circuit diagram array combiner box |
| | | Circuit diagram control enclosure |
| | | Circuit diagram distribution enclosure |
| | | Circuit diagram battery circuit breaker enclosure |
| | | Wiring diagram battery(ies) |
| | | Signed FAT report |
| | | Installation, Operation and Maintenance Manual Batteries |
| | | Installation, Operation and Maintenance Manual Solar Energy System |

## 2.2 Tools

The following measurement tools are required for the SAT:

- 1 pc. Digital multimeter (CAT IV 600 V) including test leads/cables.
- 1 pc. Current clamp meter (with minimum 0-300A DC range)
- 1 pc. Insulation tester with 50Vdc and 100Vdc range (for 24V and 48V systems)
- 1 pc. Compass (if possible with inclinometer for measure tilt)
- 1 set Torque tools 5-50Nm
- 1 pc. Toolkit (spanners, screwdriver, measure lint, etc.)
- 1 pc. Thermometer

## 2.3 Calibration certificates

Summary of calibration certificates for all measurement tools:

| Measuring instrument | Type | S/N | Date | |
|---|---|---|---|---|
| | | | Calibration | Expiry |
| Digital multimeter | | | | |
| Current clamp meter (0-300A DC) | | | | |
| Insulation tester | | | | |
| Torque tool(s) | | | | |

## 2.4 Equipment information

The SAT of Solar Energy System will be performed on following SES and applicable enclosures:

| # | Equipment | Tag No. / S/N |
|---|---|---|
| | System | |
| | Description | |
| 1 | Sub Array Junction Box (SAJB) | |
| 2 | Array Combiner Box (ACB) | |
| 3 | Control Enclosure (CE) | |
| 4 | Distribution Enclosure (DE) | |
| 5 | Battery Circuit Breaker Enclosure (BCBE) | |
| 6 | Battery Box (BB) | |

# 3 Visual Inspection

Visual inspections will be performed on the complete SES. This chapter list all the inspection points and provide an instruction for the item to be checked.

## 3.1 PV Modules and Cabling

| # | Description | Remarks | Action Y / N, by | Check OK |
|---|---|---|---|---|
| 1 | Check if PV modules are not damaged and that the surface is clean. | | | ☐ |
| 2 | Check if PV module frames are properly fixed to the support structure. | | | ☐ |
| 3 | Check if cable glands of PV module junction boxes are tightened and if lids of junction boxes are properly closed. | | | ☐ |
| 4 | Check if array cabling is properly connected inside junction boxes. | | | ☐ |
| 5 | Check if PV modules are installed as per project drawings. | | | ☐ |
| 6 | Check if PV modules are labelled. | | | ☐ |
| 7 | Check if identification numbers on array cabling are according the respective drawing. | | | ☐ |
| 8 | Check if cabling is properly fixed to support structure and / or cable trays. | | | ☐ |
| 9 | Check if earthing / grounding is properly installed. | | | ☐ |

## 3.2 Support Structures

| # | Description | Remarks | Action Y / N, by | Check OK |
|---|---|---|---|---|
| 1 | Check if support structures are installed at the correct orientation and tilt-angle | | | ☐ |
| 2 | Check if installation is according the site plan of the project drawing (special attention is required for distance between the support structures, to avoid detrimental shadow flow). | | | ☐ |
| 3 | Check if constructions nearby (fences, high poles) do not cause detrimental shadow flow. | | | ☐ |
| 4 | Check if no mechanical damage is visible and if all support structure parts, control enclosures and battery box(es) are installed as per project drawings. | | | ☐ |
| 5 | Check if bird spikes are mounted and positioned correctly. | | | ☐ |
| 6 | Check if all bolts are installed and tightened correctly, with correct torque for all support structure components and parts. | | | ☐ |
| 7 | Check if earthing / grounding is properly installed. | | | ☐ |
| 8 | Check if cable trays with cover are properly installed to the support structure. | | | ☐ |

## 3.3 Array Combiner Box(es) (ACB) / Sub-Array Junction Box(es) (SAJB)

| # | Description | Remarks | Action Y / N, by | Check OK |
|---|---|---|---|---|
| 1 | Check if box is properly fixed and on correct position on the support structure as per approved drawing. | | | ☐ |
| 2 | Check identification, tag plate(s), general appearance and condition (undamaged). | | | ☐ |
| 3 | Check if box is well accessible and door can open / close unobstructed. | | | ☐ |
| 4 | Check if terminals for connecting external cable(s) are well accessible. | | | ☐ |
| 5 | Check if all external cables are tightened correctly and that there are no loose connections. | | | ☐ |
| 6 | Check if cable glands / stopper plugs are tightened correctly. | | | ☐ |
| 7 | Check if earthing / grounding is properly installed. | | | ☐ |

## 3.4 Control Enclosure(s) (CE)

| # | Description | Remarks | Action Y / N, by | Check OK |
|---|---|---|---|---|
| 1 | Check if enclosure is properly fixed and on correct position on the support structure as per approved drawing. | | | ☐ |
| 2 | Check identification, tag plate(s), general appearance and condition (undamaged). | | | ☐ |
| 3 | Check if enclosure window is properly installed in the door and foil is removed. | | | ☐ |
| 4 | Check if enclosure is well accessible and door can open / close unobstructed. | | | ☐ |
| 5 | Check if terminals for connecting external cable(s) are well accessible. | | | ☐ |
| 6 | Check if all external cables are tightened correctly and that there are no loose connections. | | | ☐ |
| 7 | Check if cable glands / stopper plugs are tightened correctly. | | | ☐ |
| 8 | Check if earthing / grounding is properly installed. | | | ☐ |

## 3.5 Distribution Enclosure(s) (DE)

| # | Description | Remarks | Action Y / N, by | Check OK |
|---|---|---|---|---|
| 1 | Check if enclosure is properly fixed and on correct position on the support structure as per approved drawing. | | | ☐ |
| 2 | Check identification, tag plate(s), general appearance and condition (undamaged). | | | ☐ |
| 3 | Check if enclosure window is properly installed in the door and foil is removed. | | | ☐ |
| 4 | Check if enclosure is well accessible and door can open / close unobstructed. | | | ☐ |
| 5 | Check if terminals for connecting external cable(s) are well accessible. | | | ☐ |
| 6 | Check if all external cables are tightened correctly and that there are no loose connections. | | | ☐ |
| 7 | Check if cable glands / stopper plugs are tightened correctly. | | | ☐ |
| 8 | Check if earthing / grounding is properly installed. | | | ☐ |

## 3.6 Battery Circuit Breaker Enclosure(s) (BCBE)

| # | Description | Remarks | Action Y / N, by | Check OK |
|---|---|---|---|---|
| 1 | Check if enclosure is properly fixed and on correct position on the support structure as per approved drawing. | | | ☐ |
| 2 | Check identification, tag plate(s), general appearance and condition (undamaged). | | | ☐ |
| 3 | Check if enclosure is well accessible and door can open / close unobstructed. | | | ☐ |
| 4 | Check if terminals for connecting external cable(s) are well accessible. | | | ☐ |
| 5 | Check if all external cables are tightened correctly and that there are no loose connections. | | | ☐ |
| 6 | Check if cable glands / stopper plugs are tightened correctly. | | | ☐ |
| 7 | Check if earthing / grounding is properly installed. | | | ☐ |

## 3.7 Battery Box(es)

| # | Description | Remarks | Action Y / N, by | Check OK |
|---|---|---|---|---|
| 1 | Check if battery box is properly fixed and on correct position as per approved drawing. | | | ☐ |
| 2 | Check identification, tag plate(s), general appearance and condition (undamaged). | | | ☐ |
| 3 | Check if battery cables are installed as per project drawings. | | | ☐ |
| 4 | Check if the voltage and temperature sensor cable is connected properly as approved drawing. | | | ☐ |
| 5 | Check if battery cells are marked with label | | | ☐ |
| 6 | Check the general appearance (clean), condition and correct battery cell arrangement (polarity). | | | ☐ |
| 7 | Check if level of electrolyte is correct, as per manufacturer's instructions. | | | ☐ |
| 8 | Check if the poles and battery connection plates are greased with acid-free petroleum jelly as per manufacturer's instructions. | | | ☐ |
| 10 | Check if battery cell interconnections are tightened correctly, with correct torque and isolated as per manufacturer's instructions. | | | ☐ |
| 11 | Check if main power cables connections are tightened correctly, with correct torque and installed with correct bending radius. | | | ☐ |
| 12 | Check if cable glands are tightened correctly and battery box cover is properly fixed. | | | ☐ |
| 13 | Check if earthing / grounding is properly installed. | | | ☐ |

# 4 Dielectric Voltage Withstand Test

The Dielectric Voltage Withstand Test is performed between positive and ground and between negative and ground.
Components connected to earth must be disconnected before starting the test and reconnected again after finishing the test.

| # | Enclosures | Limits (insulation resistance) | Value [MΩ] | | Check OK |
|---|---|---|---|---|---|
| | | | +/gnd | -/gnd | |
| 1 | Sub Array Junction Box (SAJB) | R > 1MΩ | | | ☐ |
| 2 | Array Combiner Box (ACB) | R > 1MΩ | | | ☐ |
| 3 | Control Enclosure (CE) | R > 1MΩ | | | ☐ |
| 4 | Distribution Enclosure (DE) | R > 1MΩ | | | ☐ |
| 5 | Battery Circuit Breaker Enclosure (BCBE) | R > 1MΩ | | | ☐ |

*Note:*
*For **24V** system (approx. 28V at busbar) test voltage = **50V DC***
*For **48V** system (approx. 56V at busbar) test voltage = **100V DC***

# 5 Main Functional Checks

In order to verify the functionalities of the SES a functional check is performed on the complete system. The functional checks will be performed on the enclosures as described in chapter “7. SAT Approval Summery.

## 5.1 Battery temperature / voltage sensor

Use the following “PTC temperature sensor” table of standard value of temperature sensor resistance v/s voltage to validate the measurements.

| Temperature sensor resistance values (VTS disconnected from controller) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp. | 0°C | | 10°C | | 20°C | | 25°C | | 30°C | | 40°C | | 50°C | |
| Spec. | 1618 Ω | | 1775 Ω | | 1920 Ω | | 2000 Ω | | 2080 Ω | | 2245 Ω | | 2411 Ω | |
| Limits | LL | UL | LL | UL | LL | UL | LL | UL | LL | UL | LL | UL | LL | UL |
| Value | 1457 | 1779 | 1598 | 1952 | 1728 | 2112 | 1800 | 2200 | 1872 | 2288 | 2021 | 2469 | 2170 | 2652 |

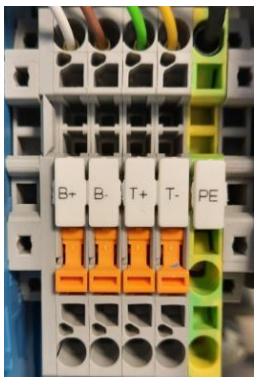
| Temperature sensor voltage values (VTS connected to controller) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp. | 0°C | | 10°C | | 20°C | | 25°C | | 30°C | | 40°C | | 50°C | |
| Spec. | 1.62 V | | 1.78 V | | 1.92 V | | 2.0 V | | 2.08 V | | 2.25 V | | 2.41 V | |
| Limits | LL | UL | LL | UL | LL | UL | LL | UL | LL | UL | LL | UL | LL | UL |
| Value | 1.46 | 1.78 | 1.61 | 1.95 | 1.73 | 2.11 | 1.80 | 2.20 | 1.88 | 2.28 | 2.03 | 2.47 | 2.17 | 2.65 |

*Temp.: ambient temperature (batteries, battery cells)*
*Spec.: standard value*
*Limits: LL = lower limit, UL = upper limit (limits ±10% of standard value)*

**Preconditions:**

- Ensure the polarity at the battery circuit breaker is correct
- Ensure the Array Switch(es) is/are switched "OFF"
- Open all isolators on the VTS input terminals (B+/B-/T+/T-)

| Check OK |
|---|
| ☐ |




VTS input terminals

---

- Switch "ON" the battery circuit breaker

The operational LED on the Σ-Ahr Controller should be on.

| **Measure battery voltage inside battery box on battery tier (+/-) and on sensor input terminals (B+/B-).** | | | |
|---|---|---|---|
| **#** | **Description** | **Measured value [V]** | **Check OK** |
| 1 | Voltage on battery tier (+/-) in battery box. | | ☐ |
| | Voltage on sensor input terminal (B+/B-) (*VTS isolators open).* | | ☐ |
| | The voltage drop between battery tier (+/-) and voltage sensor input terminals (B+/B-) should not exceed 0.15V. | | ☐ |

Measure the temperature sensor resistance on the sensor side at the temperature sensor input terminals (T+/T-).

| **Measure temperature sensor RESISTANCE on sensor when disconnected from Σ-Ahr Controller/Extension (Isolators open). Values should be within limits of "PTC temperature sensor" table.** | | | | |
|---|---|---|---|---|
| **#** | **Description** | **Ambient temp [°C]** | **Measured value [Ω]** | **Check OK** |
| 2 | Temperature sensor resistance | | | ☐ |

- Close all isolators on the VTS input terminals (B+/B-/T+/T-).

| **Measure temperature sensor VOLTAGE on sensor when connected to Σ-Ahr Controller/Extension (Isolators open). Values should be within limits of "PTC tempearture sensor" table.** |
|---|

| # | Description | Ambient temp [°C] | Measured value [V] | Check OK |
|---|---|---|---|---|
| 3 | Temperature sensor voltage | | | ☐ |

## 5.2 Σ-Ahr Charge Controller(s)

**Preconditions**

- Close all VTS terminals isolators (B+/B-/T+/T-)
- Switch "ON" the battery circuit breaker
- Switch "ON" the array switch
- Switch "ON" the main circuit breaker
- Switch "ON" all feeders

| Check OK |
|---|
| ☐ |

WARNING: make sure to switch "ON" the battery circuit breaker prior to switch "ON" the array switch. Failure to follow this sequence will cause the controller not to start!

Perform the battery charged/discharge simulation check on the Σ-Ahr Controller(s) as described below.

1&2: Press the test button "Simulation battery charged" on the Σ-Ahr Controller and check the switching of sub arrays.
Use a clamp meter to check the switching of sub arrays.

2&3: Press the test button "Simulation battery discharged" on the Σ-Ahr Controller and check the disconnection of the load.
The load should disconnect when the "Load disconnected" alarm is activated LED "ON".

| # | Σ-Ahr Controller(s) test buttons/connections | | Check OK |
|---|---|---|---|
| | Description | Limits/conditions/remarks | |
| 1 | Test button "Simulation battery charged" | All sub arrays disconnected LED's "ON" (e.g. no current from sub arrays to system) | ☐ |
| 2 | Test button release | All sub arrays disconnected LED's "OFF" (e.g. current from sub arrays to system) | ☐ |
| 3 | Test button "Simulation battery discharged" | After 10 sec. "Low battery voltage" and "Load disconnected" LED "ON" (load should be disconnected). | ☐ |
| 4 | Test button release | "Low battery voltage" and "Load disconnected" LED "OFF" (load is automatically reconnected). | ☐ |

Test button “Simulation battery charge” reference Table

Lead-Acid 24V

| **Battery voltage [V]** | **> 27.90** | **< 27.90<br>> 27.20** | **< 27.20** |
|---|---|---|---|
| **Tolerance [mV]** | ±200 | | |
| **Sub array(s) LEDs status** | ON | OFF, one or more | OFF |
| **Condition** | *@25°C, -36mV/°C | | |

Lead-Acid 48V

| **Battery voltage [V]** | **> 55.80** | **< 55.80<br>> 54.40** | **< 54.40** |
|---|---|---|---|
| **Tolerance [mV]** | ±200 | | |
| **Sub array(s) LEDs status** | ON | OFF, one or more | OFF |
| **Condition** | *@25°C, -72mV/°C | | |

NiCd 24V

| **Battery voltage [V]** | **> 27.55** | **< 27.55** |
|---|---|---|
| **Tolerance [mV]** | ±200 | |
| **Sub array(s) LEDs status** | ON | OFF |
| **Condition** | | |

NiCd 48V

| **Battery voltage [V]** | **> 55.10** | **< 55.10** |
|---|---|---|
| **Tolerance [mV]** | ±200 | |
| **Sub array(s) LEDs status** | ON | OFF |
| **Condition** | | |

Test button “Simulation battery discharge” release reference Table

Lead-Acid & NiCd 24V

| **Battery voltage [V]** | **> 25.00** | **< 25.00<br>> 24.50** | **< 24.50** |
|---|---|---|---|
| **Tolerance [mV]** | ±200 | | |
| **Low battery voltage LED status** | OFF | ON | ON |
| **Load disconnected LED status** | OFF | OFF | ON |
| **Condition** | 10 seconds delay after release. | | |

Lead-Acid & NiCd 48V

| **Battery voltage [V]** | **> 50.00** | **< 50.00<br>> 29.00** | **< 49.00** |
|---|---|---|---|
| **Tolerance [mV]** | ±200 | | |
| **Low battery voltage LED status** | OFF | ON | ON |
| **Load disconnected LED status** | OFF | OFF | ON |
| **Condition** | 10 seconds delay after release. | | |

Perform the following switching of sub array inputs as described below.

Use a clamp meter and multi-meter to check the individual switching of sub array inputs. The sub array current is interrupted or reconnected when switching.

To connect all the sub arrays (if not connected) operate test button "Simulation battery discharged" for 1 or 2 seconds. All sub array disconnected LEDs should be "OFF".
To disconnect all the sub arrays operate test button "Simulation battery charged" by holding the push button on the Σ-Ahr Controller.

| **#** | **Sub array connected** | | **Sub array disconnected** | | **Check OK** |
|---|---|---|---|---|---|
| | **Value [A]** | **Value [V]** | **Value [A]** | **Value [V]** | |
| Sub array 1 | | | | | ☐ |
| Sub array 2 | | | | | ☐ |
| Sub array 3 | | | | | ☐ |
| Sub array 4 | | | | | ☐ |
| Sub array 5 | | | | | ☐ |
| Sub array 6 | | | | | ☐ |

The following conditions should be met when testing sub array inputs:
Sub array connected (LED "OFF") then sub array current = expected current (project dependent)
Sub array connected (LED "OFF") then sub array voltage = battery voltage
Sub array disconnected (LED "ON") then sub array current = 0A
Sub array disconnected (LED "ON") then sub array voltage = open circuit voltage solar modules. Open circuit voltage should be between 32V-44V at sufficient sunlight.

## 5.3 Output circuit breaker

**Preconditions:**

- **Switch "ON" the battery circuit breaker**
- **Ensure load disconnected LED is "OFF"**

| Check OK |
| --- |
| ☐ |

Perform the followings functional checks on the output circuit breakers as described below.
Operate the individual load circuit breakers and check ON and OFF switching of the power to each load.

| # | Description | Limits / conditions / remarks | Check OK |
| --- | --- | --- | --- |
| 1 | Individual load circuit breakers | Check polarity,<br>proper operation,<br>power switching. | ☐ |
| 2 | Shunt trip 24V contact for main output load circuit breaker(s) | Check operation proper operation,<br>tripping and resetting (if applicable). | ☐ |
| 2 | Trip status contact for all load circuit breakers | Check operation on outgoing terminals (if applicable). | ☐ |

# 6 Ancillary Functional Checks

In order to verify the functionalities of the ancillary components of the solar energy system a functional check will be performed.

## 6.1 Transducer 4-20mA

Measure the load voltage transducer and load current transducer output current (4-20mA) in the control box and compare with the actual battery voltage and actual battery current. For passive transducer, apply 24V with multi-meter in series to the transducer output terminals.

| **Check battery voltage transducer (4-20mA) against simulated battery voltage (0-30V)** | | **Remarks** | **Tolerance** | **Check OK** |
|---|---|---|---|---|
| Battery voltage [V] | | 23.0V = 16.27mA<br>25.5V = 17.60mA<br>29.0V = 19.47mA | ±0.50 mA | ☐ |
| Battery voltage transducer [mA] | | | | |

| **Check load current transducer (4-20mA) against simulated load current** | | **Remarks** | **Tolerance** | **Check OK** |
|---|---|---|---|---|
| Load current [A] | | *Battery current range is project dependent* | ±0.50 mA | ☐ |
| Load current transducer [mA] | | | | |

## 6.2 Nanodac

Compare the Nanodac data logger data as displayed to the actual values.

| # | Description | On display | Actual value[1] | Check OK |
|---|---|---|---|---|
| 1 | Battery voltage [V] | | | ☐ |
| 2 | Battery current [A] | | | ☐ |
| 3 | Battery State of Charge [%]<br>(0-100%) | | | ☐ |
| 4 | Battery temperature [°C]<br>(-20°C up to +70°C) | | | ☐ |
| 5 | Total array current [A] | | | ☐ |
| 6 | System output current [A] | | | ☐ |

[1] *Battery State of Charge cannot be measured.*

## 6.3 Hard wired I/O

| # | Description | Limits/conditions/remarks | Check OK |
|---|---|---|---|
| 1 | Low battery voltage alarm Kn.x (pre-warning) (<23.00V/<46.00V for NiCd) | Low battery voltage alarm relay LED must be "ON". + Terminal | ☐ |
| 1 | Low battery voltage alarm (pre-warning) (<23.60V/<47.20V for Lead-Acid) | Low battery voltage alarm relay LED must be "ON". | ☐ |
| 2 | Load disconnected alarm (System low voltage) (<21.85V/<43.70V for NiCd) | Low battery voltage and load disconnected alarm relay LED's must be "ON". | ☐ |
| 2 | Load disconnected alarm (System low voltage) (<23.00V/<46.00V for Lead-Acid) | Low battery voltage and load disconnected alarm relay LED's must be "ON". | ☐ |
| 3 | Load disconnected alarm (System high voltage) (>31.50V/>63.00V for NiCd) | Load disconnected LED must be "ON". | ☐ |
| 3 | Load disconnected alarm (System high voltage) (>30.50V/>61.00V for Lead-Acid) | Load disconnected LED must be "ON". | ☐ |
| 4 | Earth fault alarm | Earth fault alarm relay LED must be "ON".<br>For 30mA:<br>Connect a 560Ω resistance between the positive connection and earth to simulate system earth fault. | ☐ |
| 5 | CPU failure alarm | CPU failure alarm relay LED must be "ON".<br>Switch pos. 6 on the DIP switch towards the PCB and back to simulate the CPU failure alarm. Power cycle the Σ-Ahr Controller to clear the CPU failure alarm. | ☐ |

*Note: Time delay for load disconnected alarm and low battery voltage alarm is approximately 10 sec.*

## 6.4 Others

Check the output voltage of the Distribution Box (DB).
Check the output voltage of the External Battery Charger (EBC).

- To check, connect the input to a suitable AC supply first.

| # | Description | Limits/conditions/remarks | Check OK |
|---|---|---|---|
| 1 | Check DB output voltage | Check DB output voltage range …V ±…% | ☐ |
| 2 | Check EBC output voltage | For Mastervolt (MASS Sine Inverter…)<br>Force Float (DIP switch 1)<br>26.5V (24V charger)/53V (48V Charger) | ☐ |

# 7 Outstanding Items/Punch List

Deviation related to tested and/or checked items.

| Item No. | Description | Owner | Committed date | Status |
|---|---|---|---|---|
| | | | | |
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# 8 SAT Approval Summary

The SAT of Solar Energy System has been performed and all parties agreed herewith upon the results.

| # | Description | Tag No. / serial No. | Test results | |
|---|---|---|---|---|
| | | | Pass | Fail |
| 1 | Control Box (CB) | | ☐ | ☐ |
| 2 | Battery Circuit Breaker Box (BCB) | | ☐ | ☐ |
| 3 | Distribution Box (DB) | | ☐ | ☐ |
| 4 | Array Combiner Box (ACB) | | ☐ | ☐ |
| 5 | Sub Array Junction Box (SAJB) | | ☐ | ☐ |

| Witnessed by TSS | Witnessed by | Witnessed by |
|---|---|---|
| Name: | Name: | Name: |
| Date: | Date: | Date: |
| Signature: | Signature: | Signature: |