Factory Acceptance Test

(FAT)

NCC Project Number :

Project Name : JEA Sunport

Customer :

Engineer :

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| **REV.** | **DATE** | **DOCUMENT STATUS** | **BY** | **CHK** | **APP’D** | **CUST APP’D** |

**Table of Contents**

[**1.** **SCOPE** 4](#_Toc13227199)

[**2.** **STANDARD** 4](#_Toc13227201)

[**3.** **SCOPE OF SUPPLY** 4](#_Toc13227204)

[**4.** **PRODUCT REQUIERMENTS** 5](#_Toc13227229)

[**5.** **SAFETY REQUIERMENTS** 5](#_Toc13227231)

[**6.** **CLIMATIC ENVIRONMENTAL REQUIERMENT** 5](#_Toc13227233)

[**7.** **FAT SCOPES** 5](#_Toc13227249)

[**8.** **DAILY FAT SCHEDULE** 6](#_Toc13227251)

[**9.** **REFERENCE DOCUMENTS** 6](#_Toc13227252)

[**10.** **FAT PROCEDURES** 6](#_Toc13227253)

[**11.** **TEST EQUIPMENT** 6](#_Toc13227255)

[**12.** **INSPECTION & TEST PRECEDURE** 7](#_Toc13227258)

[**12.1.** **MATERIAL RECEIVING INSPECTION-MTR** 7](#_Toc13227259)

[**12.2.** **BILL OF MATERIAL VERIFICATION** 7](#_Toc13227262)

[**12.3.** **HARDWARE TESTS** 7](#_Toc13227265)

[**12.4.** **RATC I/O TESTS** 7](#_Toc13227268)

[**12.5.** **COMMUNICATION CHECK** 7](#_Toc13227271)

[**APPENDIX A FAT SCHEDULE**](#APPENDIXA) 8

[**APPENDIX B MATERIAL RECEIVING INSPECTION-MTR**](#APPENDIXB) 9

[**APPENDIX C BILL OF MATERIAL VERIFICATION**](#APPENDIXC) 10

[**APPENDIX D HARDWARE TESTS**](#APPENDIXD) 11

[**APPENDIX E RTAC I/O TESTS**](#APPENDIXE) 12

[**APPENDIX F COMMUNICATION CHECK**](#APPENDIXF) 13

[**APPENDIX G PUNCH LIST ITEMS CLEARANCE**](#APPENDIXG) 14

[**FAT MINUTE FOR HEIS**](#FATMOM) 15

**Abbreviations**

FAT Factory Acceptance Certificate

GPS Global Positioning System

I/O Input Output

NA Not Applicable

NOK Not OK / Test not successful

OK OK / Test successful

PM Project Manager

RTAC Real-Time Automation Controller

RTST Re-test

SAT Site Acceptance Test

SCADA Supervisory Control and Data Acquisition

SOE Sequence of Events

SW Software

UPS Un-interruptible Power Supply

1. **SCOPE**

This procedure defines the activity of Inspection and test for HEIS Control RACK for JEA Sunport Project.

1. **STANDARD**

IEC Standard

ISO

UL

1. **SCOPE OF SUPPLY**
2. One (1) Set of HEIS Control Rack

1-1) Hardware

a) One (1) Set of HEIS Control (SEL-3355)

b) One (1) Set of UPS (EATON 9PX 1500)

c) One (1) Set of Ethernet Switch (SEL-2730M)

d) One (1) Set of Modbus & DIO Gateway (SEL-3505-3)

e) One (1) Set of Cooler (SK3185.830) & IoT Interface (SK3124.300)

f) One (1) Set of VPN (JUNIPER\_SRX300)

g) One (1) Set of FDF

h) One (1) Set of Monitor (HP-E223)

i) One (1) Set of DC Power Supply (SEL-9331)

j) One (1) Set of Power Strip (RS-1215-RA)

k) One (1) Set of Enclosure Heater (SK3105.370)

l) One (1) Set of Accessory

1-2) Software

a) One (1) Copy of Zenon Edition Server Unlimited Tags

b) One (1) Copy of Zenon Edition Editor 8.0

c) One (1) Copy of Zenon Report Generator

d) One (1) Copy of Zenon OPC UA Client

e) One (1) Copy of BACnet Driver

f) One (1) Copy of SNMP Driver

g) One (1) Copy of Windows Server 2019 std.(Server 2016 std. Downgrade)

h) One (1) Copy of Anti-virus (Symantec Endpoint Protection)

i) One (1) Copy of AcSELerator RTAC Software (SEL-5033)

1. **PRODUCT REQUIERMENTS**

Systems shall be subject to operational checks following installation of switchboards and panels in their permanent position

1. **SAFETY REQUIERMENTS**

This processes of surface preparation aim at both clearing all superficial impurities detrimental to the coating’s long-life and creating a favorable surface for good adherence.

1. **CLIMATIC ENVIRONMENTAL REQUIERMENT**

|  |  |
| --- | --- |
| **Condition** | **Range/Description** |
| Indoor/ outdoor use | Outdoor |
| Altitude | Up to 2000 mm |
| Temperature IEC Performance Rating  (per IEC/EN 60068-Z-1 and 60068-Z-2) | -40 to +85˚C |
| Relative humidity | 5 to 95% |
| Atmospheric pressure | 80 to 110 kPa |
| Pollution | Degree 2 |

1. **FAT SCOPES**

This Factory Acceptance Test will encompass the following sequence of activities :

* Inspection meeting
* Material receiving inspection-MTR
* Bill of Material Verification
* Hardware tests
* RTAC I/O tests
* Communication Check
* Punch List items clearance
* FAT Sign off

1. **DAILY FAT SCHEDULE**

|  |  |
| --- | --- |
| **Hours** | **Activity** |
| 08:30 – 09:00 AM | Morning Meeting |
| 09:00 – 12:00 AM | Morning Test Session |
| 12:00 – 13:00 PM | Lunch |
| 13:00 – 04:00 PM | Afternoon Test Session |
| 04:00 – 04:30 PM | Report |

1. **REFERENCE DOCUMENTS**

**Project specific documentation**

|  |  |  |
| --- | --- | --- |
| **Rev. No** | **Document Title** | **Remarks** |
| 4 | COMMUNICATION DIAGRAM OF HEIS CONTROL RACK |  |
| 4 | SCHEMATIC DIAGRAM OF HEIS CONTROL RACK |  |
| 4 | OUTLINE DRAWING OF HEIS CONTROL RACK |  |
|  |  |  |
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1. **FAT PROCEDURES**

All standard tests included in this document are described in these guidelines. Procedures and descriptions of project specific tests, if any that are added to this document are included in the test item descriptions in this document.

1. **TEST EQUIPMENT**

Test equipment used will be calibrated and released for use at the time of FAT, if applicable.

Test Equipment used is registered in table below:

|  |  |
| --- | --- |
| **Test Tool / Item** | **Serial Number** |
| Digital Voltmeter or Multi-meter (Fluke187) |  |
| Coating Thickness Gauge (QNIX 4500) |  |
| Vernier calipers |  |
| Lab Laptop |  |
| AcSELerator RTAC Software (SEL-5033) |  |

1. **INSPECTION & TEST PRECEDURE** 
   1. **MATERIAL RECEIVING INSPECTION-MTR**

Material Test Report(or Certification) Review

Instrument Certification Review

Refer **APPENDIX B** - Material receiving inspection-MTR.

* 1. **BILL OF MATERIAL VERIFICATION**

Quantity and Model number of components shall be carried out as follows in accordance with relevant standards, manufacturing specification and approved drawings.

Refer **APPENDIX C** - Bill of Material Verification.

* 1. **HARDWARE TESTS**

Design and Dimension of components shall be carried out as follows in accordance with approved drawings.

Refer **APPENDIX D** - Hardware Tests.

* 1. **RATC I/O TESTS**

According to the schematic diagram, following items must be checked.

Refer **APPENDIX E** - RTAC I/O Tests.

* 1. **COMMUNICATION CHECK**

Communication status shall be carried out as follows in accordance with relevant standards and approved drawings.

Refer **APPENDIX F** - Communication Check.

APPENDIX A : FAT Schedule

|  |  |  |
| --- | --- | --- |
| **FAT SCHEDULE** | | |
| **※ Reference Document.** | | |
| Day | Activity | |
| 1 | ◎ Inspection meeting  ◎ Material receiving inspection-MTR  ◎ Bill of Material Verification  ◎ Hardware tests  ◎ RTAC I/O tests  ◎ Communication Check  ◎ Punch List items clearance  ◎ FAT Sign off | |
| Customer Name :  Customer Reference :  Supplier Job Number :  Supplier Project Name : | | Signature |

APPENDIX B : Material receiving inspection-MTR

|  |  |  |  |
| --- | --- | --- | --- |
| **MATERIAL RECEIVING INSPECTION-MTR** | | | |
| **※ Reference Document.** | | Date : | |
| By : | |
| No. | INSPECTION PROCESS | RESULT | REMARK |
| 1 | Material Test Report(or Certification) Review |  |  |
| 2 | Instrument Certification Review |  |  |
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| Customer Name :  Customer Reference :  Supplier Job Number :  Supplier Project Name : | | Signature | |

APPENDIX C : Bill of Material Verification

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| --- | --- | --- | --- |
| **BILL OF MATERIAL VERIFICATION** | | | |
| **※ Reference Document.**  1. COMMUNICATION DIAGRAM OF HEIS CONTROL RACK (Rev.04)  2. SCHEMATIC DIAGRAM OF HEIS CONTROL RACK (Rev.04)  3. OUTLINE DRAWING OF HEIS CONTROL RACK (Rev.04) | | Date : | |
| By : | |
| No. | INSPECTION PROCESS | RESULT | REMARK |
| 1 | Verify Quantity of components is correct |  |  |
| 2 | Verify model number of components installed is correct |  |  |
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| Customer Name :  Customer Reference :  Supplier Job Number :  Supplier Project Name : | | Signature | |

APPENDIX D : Hardware Tests

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| **HARDWARE TESTS** | | | |
| **※ Reference Document.**  1. COMMUNICATION DIAGRAM OF HEIS CONTROL RACK (Rev.04)  2. SCHEMATIC DIAGRAM OF HEIS CONTROL RACK (Rev.04)  3. OUTLINE DRAWING OF HEIS CONTROL RACK (Rev.04) | | Date : | |
| By : | |
| No. | INSPECTION PROCESS | RESULT | REMARK |
| 1 | Verify the hardware and design of the Cabinet is as per approved System Design |  |  |
| 2 | Verify proper open and closing of doors and handle locks |  |  |
| 3 | Verify cabinet paint quality/finish, thickness (100 micron and above), color (RAL7035) and free of scratches and/or dents. |  |  |
| 4 | Verify dimensions of cabinet and equipment. |  |  |
| 5 | Verify labeling for each connection from power distribution unit. |  |  |
| 6 | Verify Wire type and color code wire marking |  |  |
| 7 | Verify Cleaning |  |  |
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| Customer Name :  Customer Reference :  Supplier Job Number :  Supplier Project Name : | | Signature | |

APPENDIX E : RTAC I/O tests

|  |  |  |  |
| --- | --- | --- | --- |
| **RTAC I/O TESTS** | | | |
| **※ Reference Document.**  1. SCHEMATIC DIAGRAM OF HEIS CONTROL RACK (Rev.04) | | Date : | |
| By : | |
| No. | INSPECTION PROCESS | RESULT | REMARK |
| 1 | Verify Digital Outputs status through AcSELerator RTAC  software.   * Check the buzzer sound that is connected to DO contacts by forcing DO. |  |  |
| 2 | Verify Digital Inputs status through AcSELerator RTAC software.   * Energize DI contact to check the DI status through the AcSELerator RTAC software. |  |  |
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| Customer Name :  Customer Reference :  Supplier Job Number :  Supplier Project Name : | | Signature | |

APPENDIX F : Communication Check

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| **COMMUNICATION CHECK** | | | |
| **※ Reference Document.**  1. COMMUNICATION DIAGRAM OF HEIS CONTROL RACK (Rev.04) | | Date : | |
| By : | |
| No. | INSPECTION PROCESS | RESULT | REMARK |
| 1 | Verify each communication cables connect to Ethernet Switch  (SEL-2730M) from each Device as per Communication Diagram. |  |  |
| 2 | Verify that IP Address and Subnet mask are correct |  |  |
| 3 | Check redundancy port of HEIS CONTROL(SEL-3355) by disconnecting one communication port |  |  |
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| Customer Name :  Customer Reference :  Supplier Job Number :  Supplier Project Name : | | Signature | |

APPENDIX G : Punch List items clearance

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| **PUNCH LIST ITEMS CLEARANCE** | | | |
| **※ Reference Document.**  1. COMMUNICATION DIAGRAM OF HEIS CONTROL RACK (Rev.04)  2. SCHEMATIC DIAGRAM OF HEIS CONTROL RACK (Rev.04)  3. OUTLINE DRAWING OF HEIS CONTROL RACK (Rev.04) | | Date : | |
| By : | |
| No. | COMMENTS | | REMARK |
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| All deficiencies recorded in the list above are analyzed and appropriate actions were started to get the deficiencies corrected. All corrected or accepted deficiencies are signed off as CLOSED in the list.  Deficiencies not closed in the punch list summary will remain open and be part of the FAT Completion Report.  Required actions to resolve the outstanding deficiencies will be defined in that report. | | | |
| Customer Name :  Customer Reference :  Supplier Job Number :  Supplier Project Name : | | Signature | |

FAT Minute for HEIS

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| **FAT Minute for HEIS** | | |
| Location : | | |
| Date : | | |
| Participant : | | |
| Name | Title | Mail |
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| **Conclusion :**  As per test procedure, The FAT is completed. These test items are witnessed by all parties.  Enclose :  1) Appendix A FAT Schedule  2) Appendix B Material receiving inspection-MTR  3) Appendix C Bill of Material Verification  4) Appendix D Hardware tests  5) Appendix E RTAC I/O tests  6) Appendix F Communication Check  7) Appendix G Punch List items clearance | | |