



Toase-eh Park Sanati Gohar Ofogh
Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN
ENGINEERING OF STYRENE PARK OFFSITE**



Document Title: PLC FAT Procedure

Document No.:

Rev. R0

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STYRENE PARK OFFSITE

Document Title:
PLC FAT Procedure

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1. INTRODUCTION

1.1 General Project Description

This document has the purpose of FAT Procedure of PLC for ABS Regeneration Unit to be provided for JAM ABS & RUBBERS PLANT (BANDAR ASSALUYEH).

1.2 Project Definition





Owner: Polymer Pad Jam Co.

Consultant: Tarhe No Andishan Company

Vendor/Integrator: Kasravand Engineering & Construction

1.3 Scope

This document covers requirements for FAT Procedure of PLC for ABS Regeneration Unit to be provided for JAM ABS & RUBBERS PLANT(BANDAR ASSALUYEH).

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1.1 General

1.1.1 Test Category

The FAT (Factory Acceptance Test) has 4 main categories;

A.1 Hardware Check

A.2 Functional Check

A.3 Foreign Device Interface Test

A.4 Pre-Shipment Test

The details are specified in the attached checklist.

1.1.2 Test Document





The latest approved version will be provided for FAT document. This document will be three hard copied, and provided for the participants. (The contractor, and the end user, each)

1.1.3 Punch Items (Non-conformance Report)

Any failures and non-conformances discovered during the FAT will be recorded in the "NCR Report" which will be designed later, and reported to the Contractor. Any punch list items during the FAT period will be immediately cleared. For critical hardware punch items, the corrective action result shall be submitted to the customer for approval.

1.2 Test Team Organization

Vendor will assign the project-involved design team to the test organization. They will be also assigned to the site commissioning.

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1.3 FAT Schedule

Later it will be decided through discussion with the contractor.

1.4 Special Remarks

This modification list during FAT will be recorded separately from the punch list. It shall be duly signed-off by the contractor participants.

1.5 FAT Document

Hardware manufacturing specifications

- Control System Configuration as per submitted wiring diagram
- Control System Rack Cabinet Layout as per submitted wiring diagram
- Bill of Material as per submitted wiring diagram

1.6 Acceptance Rules

1.6.1 Observation classifications

Observations should be raised whenever the expected results differ from the actual results or any other noteworthy observations are made.





Observations should be reviewed after an inspection or batch of individual inspections has been completed. The observation may then be categorized as one the following and appropriate actions shall be taken:

-NOTED: The actual results match the expected results. No further action is required and the observation was considered worth nothing (i.e. this may occur when a particular function or operational requirement was met which is considered a milestone achievement in the inspection).

-DEVIATED: The actual results are correct, but the expected results were wrong. If the reference documentation was incorrect, it should be updated so that a re-testing capability is maintained.

-TOLERABLE: Actual results produced are acceptable even though these do not agree with the expected results or the design document.

-ERROR: The system cannot go into live operation until the fault has been corrected.

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1.6.2 ERRORS Classification





The error Conditions that may encountered during the FAT includes:

- a) Major Errors
- b) Mediocre Errors
- c) Minor Errors

Major Errors: These are faults, which can cause the system to crash or malfunction and required the system to be rebooted. These errors may also cause destruction or corruption of data that is non-recoverable.

Mediocre Errors: These are errors which prevents any use of a particular function, or causing it not to perform properly, or having the function not performing with full compliance with the specifications.

Minor Errors: of a particular function are behaviours or errors which do not affect its performance or the system performance. Such errors include items such as incorrect but still usable displays or additional required desirable features.

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1.6.3 Definition of Acceptance Test Actions

Abandoned:

Acceptance Testing can be abandoned when formal execution of the agreed inspection item is stopped because of excessive problems with the system. When testing is abandoned; any successful result already achieved has no validity as regards to formal sign-off. After abandonment, it is necessary to subsequently re-run the entire acceptance test, at a later agreed schedule, to achieve a successful approval and sign-off.

Sign-off:

An individual inspection item shall be signed-off when the inspection item has been executed according to the success criteria and the executed results were produced. When all inspection items are completed and signed-off, the Acceptance Test is considered Completed. The acceptance Test certificate shall be signed and the project proceeds to the next phase.





Criteria for acceptance or NON-Acceptance:

Criteria for acceptance or non-acceptance shall be decided during the FAT by the client based on the level of conformance to the approved documents or alternative, as cleared in ITP as a separated document. The validity of the sign-off to the acceptance test is subjected to relevant error(s) being resolved subsequently.

1.7 Responsibilities and inspection plan

1.7.1 Objective of responsibilities definitions

Definition for responsibilities shall be existed in ITP to ensure that the acceptance tests are carried out in conformance with an agreed procedure. It also ensures that there shall exist authorized personnel from client, end-user and Vendor end to arbitrate any on-the-spot decisions and schedule changes which have resulted from the acceptance tests.

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END-USER: The end-user shall appoint an inspector cum test approver to conduct the acceptance tests. The test approver will have the authority to sign-off the inspection item certificates as well as the acceptance test certificate. The sing-off will take place once the completion criteria have been met. Once signed off, the test will be deemed accepted and the decision will be final. The inspector shall participate in the test and observed the test results on a daily basis. The test approver shall approve the inspection items based on the test results recorded.

PURCHASER: The purchaser shall appoint an inspector cum test approver to conduct the Acceptance tests. The test approver will have the authority to sign-off the inspection item certificates as well as the acceptance test certificate. The sing-off will take place once the completion criteria have been met. Once signed off, the test will be deemed accepted and the decision will be final. The inspector shall participate in the test and observe the test results on a daily basis. The test approver shall approve the inspection items based on the test results recorded.

VENDOR: Shall appoint a test supervisor to organize and manage all aspects of the Acceptance tests. VENDOR shall carry out the testing and record the test results on a daily basis. The test supervisor will have the authority to approve variations or deviations from the Schedule and will ensure that all tests are conducted in accordance with the acceptance test document. The project manager will have the authority to request for a variation order if the changes are found to be additional or vary from approved documents or alternative. The project manager will ensure that, if required, the tests are repeated and that, if required, new test(s) be inserted.

1.8 CORRECTIVE CHANGES

Corrective changes do not constitute as a variation order. These changes shall comprise from the punch list items from the acceptance tests. Depending on the magnitude and level of these changes, they may be implemented during the acceptance test or after the acceptance test. VENDOR shall carried out this work



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accordingly and decide the appropriate time to do so. Once corrected, the changed item should be marked on the punch list. This shall be follow up by a re-check and verification by the client and the end user.

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1.9 Quality Inspection Standards (QIS)

IEC-60870-5-1	Transmission Frame Formats
IEC-60870-5-2	Link Transmission Procedure
IEC-60870-5-3	General Structure of Application Data
IEC-60870-5-4	Definition and Coding of Application Information Elements



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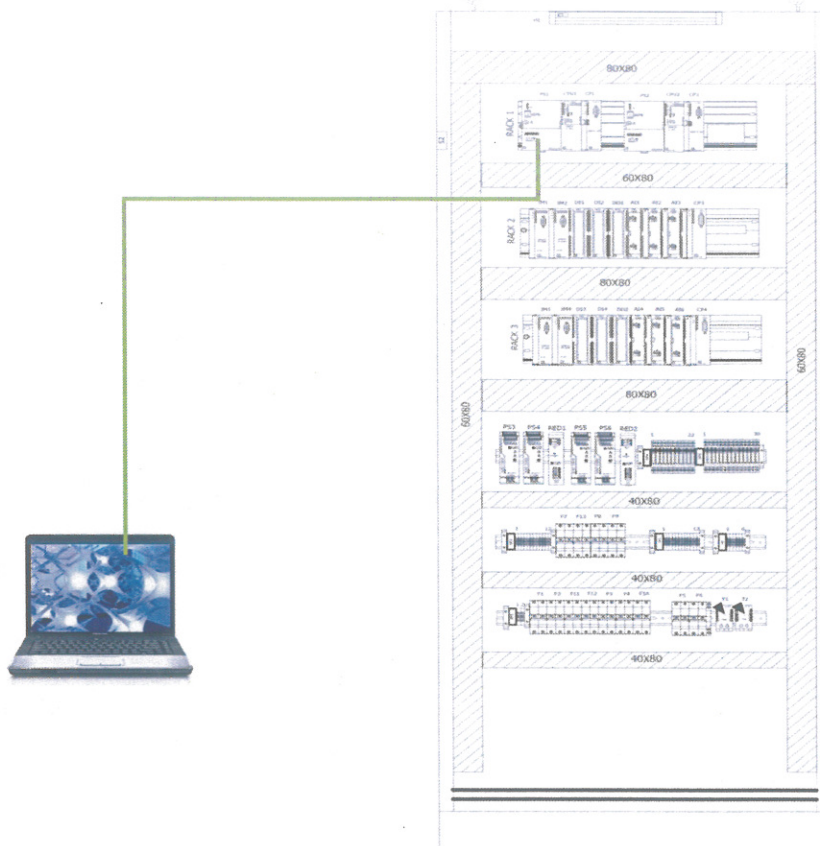
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2. APPENDIX

This procedure has been prepared to test of following equipment:

- Control System included PLC panels
- HMI pages of the project
- I/O hardware check

To do this test we will turn on PLC panel and software will be checked via a laptop connected to the PLC as following configuration.







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A.1	Hardware Check		
A.1.1	Cabinet Structure		
Purpose: The purpose of this test is to check the Cabinet Structure, dimension, protection, ventilation and painting.	Validation:		
	Pass	Partially Pass	Fail
Reference: PANEL LAYOUT			
Procedures Visually inspect each cabinet based on above reference and the criteria.			
Criteria Visual inspection and dimensional check of cabinet Check of degree of mechanical protection Visual check of panel ventilation Visual check of the condition of painted surface Check thickness of Painting Mechanical Check of Doors and Locks			
Remarks:			
Signs:			
CLIENT Co.:	Inspector:	VENDOR:	

A.1	Hardware Check								
A.1.3	<i>Panel Equipment</i>								
<p>Purpose:</p> <p>The purpose of this test is to check equipment inside the panel, order numbers, quantities and installation location.</p> <p>Reference:</p> <p>PANEL LAYOUT ,</p> <p>Procedures</p> <p>Visually inspect each cabinet based on above reference and the criteria.</p> <p>Criteria</p> <p>Check of equipment list and installed equipment.</p> <p>Check if equipment that is installed in their location.</p>		<p>Validation:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Pass</th> <th style="width: 33%;">Partially Pass</th> <th style="width: 33%;">Fail</th> </tr> </thead> <tbody> <tr> <td style="height: 400px;"></td> <td></td> <td></td> </tr> </tbody> </table>		Pass	Partially Pass	Fail			
Pass	Partially Pass	Fail							
Remarks:									
Signs:									
CLIENT Co.:	Inspector:	VENDOR:							





A.2	Functional Check			
A.2.1	<i>Panel electrical Devices Checking</i>			
Purpose: The purpose of this test is to check Fans, Lamps, thermostat and socket		Validation:		
		Pass	Partially Pass	Fail
Procedures For lamp test, open and close front and rear panel doors For fan test, change the fan thermostat set point to a lower temperature than factory environment. For socket test, connect a laptop to socket and see if it is charging				
Remarks:				
Signs:				
CLIENT Co.:	Inspector:	VENDOR:		

A.2	Functional Check			
A.2.5	Loop Check			
<p>Purpose:</p> <p>The purpose of this test is to check wiring inside the panel and all I/O channels</p> <p>Initial Conditions:</p> <p>System in normal operation</p> <p>Procedure:</p> <p>For digital inputs jumper terminals one by one and check HMI the correct action.</p> <p>For digital outputs send commands from HMI for all channels and check output terminals. If signal is OK we have 24 or 48VDC (via multimeter) in output terminal.</p> <p>For analog inputs we will assign signal via calibrator in the range of 4-20mA. At first we assign 4mA then we increase it to 8mA to see different current level and also change effect. Then we assign 20mA signal to see full range and then we decrease current to 16mA to see change effect. All of test result we be shown in HMI pages analog objects.</p> <p>For analog output signals we will send data from HMI and we will check output terminals via multimeter</p> <p>Criteria</p> <p>Loop checking completely done and pass/fail table in I/O list shall be signed</p>		Validation:		
		Pass	Partially Pass	Fail
Remarks:				
Signs:				
CLIENT Co .:	Inspector:	VENDOR:		

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A.2	Functional Check		
A.2.6	<i>Graphics Display</i>		
Purpose: The Graphic displays user defined graphics for the convenience of operation. The purpose of this test is to verify the correct display and functions of user-defined graphics and faceplate allocation as in the worksheets. Criteria Call up the Graphic Display Page. Check that displays are similar to P&IDs. Check that dynamics data are correct as defined according to the variable.		Validation:	
		Pass	Partially Pass
Remarks:			
Signs:			
CLIENT Co .:	Inspector:	VENDOR:	

A.2	Functional Check			
A.2.7	<i>Alarm / Event Display & Logging</i>			
Purpose: This check is to verify that the system generates Alarm/ Event and logging display Criteria By wiring jumper any alarm-source input of Control System. One, or consequent alarms will be displayed Check the VDU display Check the logging display By operational manual command on the VDU, some event will be logged displayed		Validation:		
		Pass	Partially Pass	Fail
Remarks:				
Signs:				
CLIENT Co .:	Inspector:	VENDOR:		

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A.3	Pre-Shipment Test											
Reference: PACKING AND MARKING PROCEDURE, Criteria Appropriate number of desiccant bags inside the panel. Wooden pallet under the panel with sufficient clearance for lift truck. Thick layer of thermocol in front side of panel. Sides and top of panel covered by flexible thermocol. Entire panel wrapped by PE sheet. Packing tape to secure the coverage. The surrounding of package will be fixed by means of PE strap and steel buckles 2-3 turns. Wooden cage with space between timbers about 30 cm. This wooden enclosure is fixed to base pallet. The sides and top of panel will be enclosed by shooks, all of which are fixed to base pallet properly. The identification label will be aligned to each packing indicating following items: Logo and name, Project and client name, Order number and contract number, Panel description, Package number, Weight and dimensions Warning signs				Validation: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Pass</th> <th style="width: 33%;">Partially Pass</th> <th style="width: 33%;">Fail</th> </tr> </thead> <tbody> <tr> <td style="height: 400px;"></td> <td></td> <td></td> </tr> </tbody> </table>			Pass	Partially Pass	Fail			
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