

AMP	Title	LAR1C AMP BPCS Configuration Project C-FAT Procedure – NA_DIB			By	Xenon OptumPCP	
					Rev	B	
	Num	747002-LAR1C-AUT-PRO-0113	Project	747002	Date	08-Jun-23	
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AUTOMATION MODERNIZATION PROGRAM

LOS ANGELES CARSON REFINERY

LAR1C AMP BPCS CONFIGURATION PROJECT

C-FAT PROCEDURE – NA_DIB

Revisions and Approvals					
Rev	Date	Reason for Issue	Originated By:	Reviewed By:	Approved By:
B	08-Jun-23	Issued for Use	AJ	RP	JTJ
A	20-Mar-23	Issued for Review	AJ	RP	JTJ

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Revision History

Rev	Description	Section
A	Issued for Review	All
B	Issued for Use	--

Assumptions

No.	Description	Section
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Holds

No	Description	Section
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1. General

1.1 Introduction

The Los Angeles Refinery Carson (LARC) facility is completing an Automation Modernization Program (AMP) to replace obsolete automation equipment and to migrate the existing functionality and operability to the Honeywell Experion Process Knowledge System (EPKS) platform.

The LAR1C project scope is to migrate and/or upgrade the existing functionality and operability of identified Basic Process Control System (BPCS) consoles and controllers as well as operator and engineering stations to comply with current industry standards and practices. The migration will be from the existing Honeywell High Performance Process Manager (HPM)¹, Application Module (AM) controllers, Process Manager Input/Output (PMIO), and Basic Controllers to new Honeywell Experion C300 controllers and Series C and Universal Input/Output (UIO) and (UIO-2). The migration of the existing 3rd-party device serial interfaces to the C300 controllers shall be via either Modbus TCP/IP using Peer Communication Data Interfaces (PCDI), Ethernet Interface Module (EIM) or EPKS Server Supervisory Control and Data Acquisition (SCADA) points and Human Machine Interface (HMI) screens migrated using HMI WebBuilder.

1.2 Scope

The scope of this Configuration Factory Acceptance Test (C-FAT) procedure is limited to application configuration in the C300 Controller or EPKS server resulting from the migration of the original controllers/tags. This test procedure will not be used to verify configuration of the EPKS server or network components.

This procedure includes the following test checklists:

- Application Configuration—Control module and Function Block parameter configuration
- Application Function—Application function per the original controller application and existing Control Language (CL) programs

¹ The scope of the HPM migration is limited to specific functions if it is determined to provide a more robust solution of the other control loops migrating to the C300 controllers.

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2. Acronyms and Definitions

2.1 Acronyms

Table 2.1 defines the acronyms used within this document.

Table 2.1. Acronyms

Acronym	Description
AMP	Automation Modernization Program
BPCS	Basic Process Control System
C-FAT	Configuration Factory Acceptance Test
CL	Control Logic
EIM	Ethernet Interface Module
EPKS	Experion® Process Knowledge System
HMI	Human Machine Interface
HPM	High Performance Process Manager
I/O	Input/Output
LAR	Los Angeles Refinery
LARC	Los Angeles Refinery Carson
MPC	Marathon Petroleum Corporation
PCDI	Peer Communication Data Interface
PMIO	Process Manager Input/Output
RSP	Refining Standard Practice
SCADA	Supervisory Control and Data Acquisition
UIO	Universal Input/Output

2.2 Project Definitions

Table 2.2 describes terms used in this document.

Table 2.2. Project Definitions

Definition	Description
Xenon Team	Xenon Project Team or their authorized representative(s)

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Definition	Description
LAR Site Team	LAR site team or their authorized representative(s)
Automation Contractor	MPC-appointed Automation Contractor or their authorized representative(s)

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3. References

3.1 MPC and LAR Standards

Table 3.1 records the specifications that shall be referenced during testing. Any deviations from the specifications are recorded in an addendum to the specification and will be referenced in the table below.

Table 3.1. Codes and Standards

Document Number	Rev	Document Title
AMP Central Global Specifications		
AMP-GBL-SIS-INS-0002	A1	Applying MPC RSPs for SIS, Heaters, and Boilers
AMP-GBL-PM-SPC-0001	A3	T/A Integration and Cutover Specification
AMP-GBL-PM-SPC-0002	A1	Automation Specification
AMP-GBL-PM-SPC-0004	5	HMI Specification
AMP-GBL-PM-SPC-0009	A3	Third-Party Integration Specification
AMP-GBL-PM-SPC-0012	A0	Experion C300 Configuration Specification
AMP-GBL-PM-SPC-0020	3	Process Automation System Naming Specification
AMP-GBL-PM-SPC-0022	2	Automation System Testing Specification
Refining Standards and Specifications		
RSP-1172-024	13	Heater Application Standard

3.2 Project Reference Drawings, Documents, and Software Backups

Project reference documentation is listed in Table 3.2. The revisions used during testing shall be recorded during the test.

Table 3.2. Project Reference Drawings/Documents/Software Backup

Reference Number	Rev	Reference Title
LAR AMP BPCS Documentation		
747002-LAR1C-AUT-IOA-0100		LAR1 AMP BPCS Configuration Project I/O List - Carson
747002-LAR1C-AUT-SPC-0101		LAR1C AMP BPCS Configuration Project HMI Migration Specification - 1 Reformer

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Reference Number	Rev	Reference Title
747002-LAR1C-AUT-SPC-0102		LAR1C AMP BPCS Configuration Project HMI Migration Specification - 2 Reformer
747002-LAR1C-AUT-SPC-0110		LAR1C AMP BPCS Configuration Project Software Migration Specification - REF2-C300-21P/22S
747002-LAR1C-AUT-SPC-0111		LAR1C AMP BPCS Configuration Project Software Migration Specification - REF2-C300-23P/24S
747002-LAR1C-AUT-SPC-0112		LAR1C AMP BPCS Configuration Project Software Migration Specification - LEDDIB-C300-25P/26S
747002-LAR1C-AUT-SPC-0113		LAR1C AMP BPCS Configuration Project Software Migration Specification - SRD-C300-27P/28S
747002-LAR1C-AUT-RPT-0120		LAR1C AMP BPCS Configuration Project Parameter Validation Report - REF2-C300-21P/22S
747002-LAR1C-AUT-RPT-0121		LAR1C AMP BPCS Configuration Project Parameter Validation Report - REF2-C300-23P/24S
747002-LAR1C-AUT-RPT-0122		LAR1C AMP BPCS Configuration Project Parameter Validation Report - LEDDIB-C300-25P/26S
747002-LAR1C-AUT-RPT-0123		LAR1C AMP BPCS Configuration Project Parameter Validation Report - SRD-C300-27P/28S
747002-LAR1C-AUT-FDS-0109		LAR1C AMP BPCS Configuration Project Equipment Functional Design Specification - NA_DIB

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5. Test Procedure

5.1 Application Configuration Check

The following application configuration checks are designed to verify that the BPCS application parameters values and connections are configured as specified in the relevant project design documents or per the original controller configuration (where applicable).

Parameter value verification should be performed using an extract from the BPCS application configuration or by directly viewing the parameter value in Project View of the Control Builder application.

The output of an automated comparison tool, application extracts, or screenshots used to verify configuration parameter values should be highlighted and appended to the appropriate appendix of this document as evidence of testing.

In the following procedures, the terms FIXED and DESIGN are used in reference to parameter values and connections.

A FIXED parameter value or connection is considered to be any parameter or connection that should not be changed when the template is instantiated as it may undermine the functional or operational integrity of the template.

A DESIGN parameter value or connection is any parameter that is not considered FIXED. All discrepancies between application and template default DESIGN parameter values must be verified and the reason for the discrepancy recorded as part of the evidence of test. Typically, discrepancies are due to the application parameter values being modified to match the original controller configuration value.

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Step No.	Action/Observation	Pass/NA	Initial & Date	Comments
5.1.0	BPCS Templates Parameter Configuration			
5.1.1	Confirm that the application FIXED and DESIGN parameter values are configured as specified in the project design documents or EB Files where applicable: - AMP C300 Configuration Specification - AMP BPCS Software Migration Design Specification Section 4.0 - EB Files Attach the result of the comparison to Appendix A.			
5.1.2	Sample test a number of parameters within the BPCS comparison report to verify the correct relationship between the configured BPCS application parameter value and original parameter value. Parameter values that have been manually verified should be identified with the comment “Manual Check OK.” Attach the results of the sample testing to Appendix A.			

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Application Configuration Check Completion:

Comments/Outstanding Actions:

Application Configuration Check Acceptance:

Customer

Name	Signature	Date

Xenon

Name	Signature	Date

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5.2 Application Functional Check

The tests are designed to verify that the BPCS application is configured to meet the functional and operational requirements specified in the relevant project design documents and per the original controller configuration (where applicable).

The testing is not intended to verify all of the inherent functionality of the BPCS templates as this has been tested during BPCS template development and verified by checking the majority of the application configuration parameter values. However, spot checking template parameter values and scenarios (abnormal conditions or unstructured tests) not described in the project design documents is encouraged to verify the suitability of the template functions.

A full functional test shall be performed on an instance of any new template that has been implemented as part of the BPCS application, and the results of the test shall be attached to this document. The testing will be used as evidence of acceptance of the template for use within the BPCS application.

Functional testing should verify parameter configuration whose values are not obtained from project design documents or cannot be validated as part of Section 5.3. The configuration and interaction of BPCS templates and complex control schemes should be verified as a consequence of the functional testing.

Functional testing will be performed either by HMI object operation or by manipulating analog or digital tag values within the BPCS application to create the conditions required to verify the requirements described in the project design documents or existing controller configuration. For example, the functional testing could include checking that the correct analog or digital output tag changes in response to a command or a change in the value of an analog or digital input tag.

The HMI should be used to verify that the tag status, values, and alarms are displayed correctly and that the desired functional and operational requirements are achieved. All tests should be performed while logged in as Operator and with HMI sound enabled unless specifically stated otherwise.

Particular attention should be given to the implementation of any application modifications required to facilitate functional testing. As far as practicable, all modifications should be made in the application Monitoring view and should not compromise the normal functional or operational behavior of the control scheme being tested. A log item shall be raised for any instances where the function test cannot be satisfactorily performed to ensure that it is specifically tested as part of Site Acceptance Testing.

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During functional testing, design documentation, including the HMI Migration Specification, P&IDs, Parameter Validation Report, Software Migration Specification, and Equipment Functional Design Specification, shall be marked and attached to this document as evidence of testing.

Step No.	Action/Observation	Pass/NA	Initial & Date	Comments
5.2.0	Application Functional Check			
5.2.1	Confirm that the controller applications are configured to meet the functional and operational requirements specified in the project design documents and existing controller configuration (where applicable). Functional testing will be used to confirm that all existing tags and their associated functionality has been successfully migrated to the controller.			

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Step No.	Action/Observation	Pass/NA	Initial & Date	Comments
5.2.2	During the course of testing, the Software Migration Specification document shall be highlighted to confirm each existing tag and its functionality have been incorporated. Justification should be provided for all existing tags that have not been migrated. A printout of the existing CL programs should be highlighted and provided as evidence of testing and migration. Where applicable, the equipment functional design specification document shall be highlighted and provided as evidence of testing and migration. Configuration parameter values verified during testing should be highlighted in the attachment in Appendix B.1.			
5.2.3	All test results, additional test scenarios, and observations should be documented and attached to Appendix B.1.			

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Application Functional Check Completion:

Comments/Outstanding Actions:

Application Functional Check Acceptance:

Customer

Name	Signature	Date

Xenon

Name	Signature	Date

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6. FAT Acceptance Certificate

CONFIGURATION FACTORY ACCEPTANCE TEST CERTIFICATE Automation Modernization Program (AMP) AMP LAR1C BPCS Configuration Test Specification NA_DIB	
THE UNDERSIGNED HAS INSPECTED AND WITNESSED THE TESTS WITHIN THIS PROCEDURE AND ITS APPENDICES. THE UNDERSIGNED ACCEPTS THAT THE SYSTEMS HAVE BEEN TESTED TO THE AGREED PROCEDURES AND MEETS THE REQUIREMENTS OF THE PURCHASE ORDER REQUIREMENTS.	
LARC: _____ Title: _____ Date: _____	XENON: _____ Title: _____ Date: _____
Overall Test Completion Summary: 	

Rev B, 06/08/2023