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PP	Restricted to other programme participants (including the Commission Services)	
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1 INTRODUCTION

1.1 **PROJECT SCOPE**

The CHORIST project will propose solutions to increase rapidity and effectiveness of interventions following natural hazards and industrial accidents, in order to enhance citizens' safety and communications between rescue actors.

1.2 **PURPOSE OF THE DOCUMENT**

This document describes how the CHORIST Training System software system will be tested to ensure that it performs as intended, and to improve its completeness, quality, reliability and maintainability.

1.3 **DOCUMENT VERSION SHEET**

Version	Date	Description, modifications, authors
V1.0.1	24-11-2008	First edition
V1.0.2	24-11-2008	Updated by AVAN
V1.0.3	25-11-2008	Submitted for approval
V1.0	17-12-2008	Document approved
V 1.1	15-10-2009	Typos corrected & set to PUBLIC

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2 REFERENCE DOCUMENTS, DEFINITIONS AND ABBREVIATIONS

2.1 REFERENCE DOCUMENTS

Table 1 - Reference and Applicable documents lists all the applicable and reference documents. Each document is marked as applicable (A) or referenced (R).

Reference	Document	Referenced (R) / Applicable (A)
[1]	CHORIST-General target design - v7	A
[2]	Report on user requirements and initial supporting cases- SP1.D4	A
[3]	System Specifications - SP1.D6	A
[4]	Report on system architecture – SP1.D8	A
[5]	Report on training system definition and design – SP2.D4	A
[6]	ERAW and ERAS system test plan – SP2.D5	A
[7]	Report on demonstration trial definition (preliminary version) – SP5.D1	A
[8]	Report on demonstration trial definition (final version) – SP5.D2	A
[9]	IEEE 829 Standard for Software Testing	R

Table 1 - Reference and Applicable documents

2.2 DEFINITIONS

Event:

An **Event**, in CHORIST, is the occurrence of a natural or human induced incident. An Event can have occurred or be forecasted. The description of an Event shall contain at least its nature, its extent and its occurrence time (future or passed).

Risk:

The **Risk** is the probability of harmful consequences, or expected loss (of lives, people injured, property, livelihood, economic activity disrupted or environment damaged) resulting from interactions between an Event and vulnerable / capable conditions.

The Risk for CHORIST is the combination of the Event, its probability of occurrence, and the severity of its impacts (in terms of populations and infrastructures affected). A Risk description contains impacts assessments over the time and mentioned the Event which causes the Risk.

Note: a Threat differs from a Risk in the sense that a threat is a very low-probability but serious Event which some analysts may be unable to assign a probability in a Risk assessment because it has never occurred, and for which no effective preventive measure (a step taken to reduce the probability or impact of a possible future Event) is available.

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Alert:

An **Alert** is a signal to indicate a Risk whose probability has exceeded a predefined value.

In CHORIST, when an Alert is raised, it shall be linked to the associated Risk description.

Vulnerability Map:

The **Vulnerability Map** is a database that contains the geographical location of populations and infrastructures, together with their "value". It is used to evaluate the consequence of an Event in an area in terms of lost casualties or infrastructures destruction. For example, the Vulnerability Map would show that an Event that occurs in the desert is less serious than an Event which occurs in a dense residential area or in a chemical industry complex.

Situation:

The **Situation** of an area is the description of its state. It provides with information on what is different in the area compared to its usual state. The Situation can contain damages description, weather conditions, fire or flood extent, pollution description and extent...

Current Situation:

The **Current Situation** is the Situation in the present time.

Forecasted Situation:

The **Forecasted Situation** is the Situation that is expected in a specific future time.

Common Operational Picture (COP):

The **Common Operational Picture (COP)** is a single set of information, shared by all stakeholders of an Event and which contains all the relevant elements. A Common Operational Picture facilitates collaborative planning and assists all echelons to achieve situational awareness. For CHORIST, the COP comprises validated data about the Situation, the Events (forecasted or occurred), the Risks, the infrastructures and populations, the on field teams' location and means...

System Requirements:

The **System Requirements** are a transformation the users or stakeholders, needs-driven view of desired system services into a technical view of a required system product that could deliver those services. System Requirements specify, from the developer's perspective, what the system is required to do in order to satisfy stakeholder needs. The System Requirements are the basis for verifying the conformance of the supplied system.

Each System Requirement is unique, complete, unambiguous, consistent with all other requirements, implementable and verifiable. System Requirements are consistent, achievable (given current technologies or knowledge of technological advances) and expressed at an appropriate level of detail. They are a necessary and sufficient response to User Requirements and a necessary and sufficient input to other processes, in particular architectural design and sub-system design.

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System Architecture:

The **System Architecture** is the result of the partition of system functions identified in the System Requirements into an implementable set of subsystems elements, which means a set of separate problems of manageable, conceptual and, ultimately, realizable proportions. The System Architecture is the description of the sub-systems and their interfaces.

System Specification:

The **System Specification** is the activity of specifying what the system does. This activity's result are the System Requirements.

System Specification is also the name of the SP1.D6 document which contains the System Requirements.

System Design:

The **System Design** is the activity of defining sub-systems and their interfaces. This activity's result is the System Architecture.

External Interface:

An **External Interface** is an Interface between a CHORIST entity and an entity which is not a part of the CHORIST system.

Internal Interface:

An **Internal Interface** is an interface between two entities which are parts of CHORIST system.

2.3 ABBREVIATIONS

CAP	Common Alerting Protocol
CH	Chemical Incident
COP	Common Operational Picture
Demo_Sys	Demonstrated System
Dev_Sys	Developed System
ERAS	Environmental Risk Assessment
ERAW	Environmental Risk Awareness
ERM	Environmental Risk Management
FF	Flash Flood
HW	Hardware
SW	Software
Target_Sys	Target System
TS	Training System

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3 DOCUMENT OVERVIEW

3.1 EXECUTIVE SUMMARY

This document contains the CHORIST Training System test plan. It pertains exclusively to the developed and demonstrated systems as indicated in the system timeline in Figure 1 below.

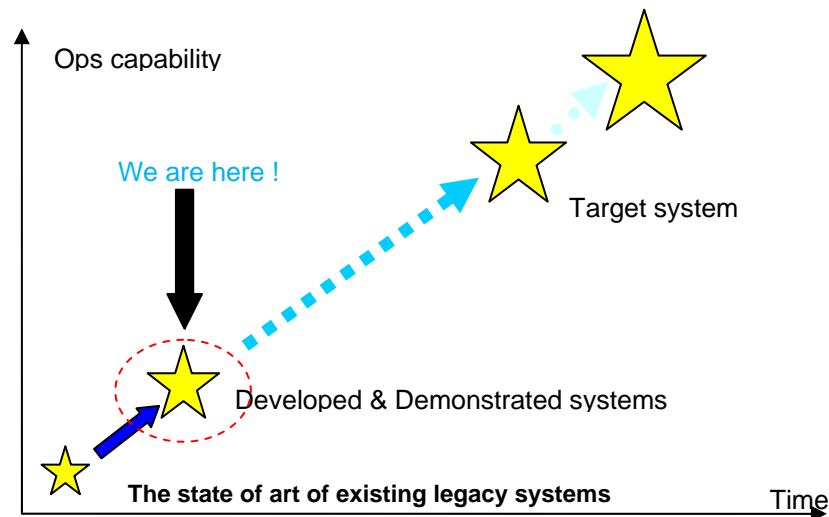


Figure 1 - Timeline towards the CHORIST Target System and Vision

The document is divided into the following sections;

- Test plan
- Test preparation
- Unit testing
- Appendix

The test plan defines the methodology, resources, tools, testing tasks and assumptions made for purposes of defining the tests.

The test preparation segment of the document defines the design of the test cases and test procedures.

The bulk of the document constitutes the actual test cases and their associated test procedures and pertains wholly to uniting test of the Training System, with each test case promptly succeeded by its associated test procedure(s). This format is replicated throughout the document.

As the training system is only a fraction of the larger CHORIST SP2 software system, the ERAW and ERAS system test plan (SP2.D5 in 2.1 above), includes integration and system testing to demonstrate how all the components that constitutes the CHORIST system software i.e. ERAW, ERAS and Training System, work together as a functional unit.

The document concludes with an appendix that contains a matrix of each test case, matched against its associated test procedure(s).

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3.2 DOCUMENT POSITION IN PROJECT ACTIVITIES

This document is a deliverable of SP2 (WP21 & WP22) T212 and T222 activities. It derives from the CHORIST user requirements, through the system specification and design to software development and testing as shown in **Erreur ! Source du renvoi introuvable.** below.

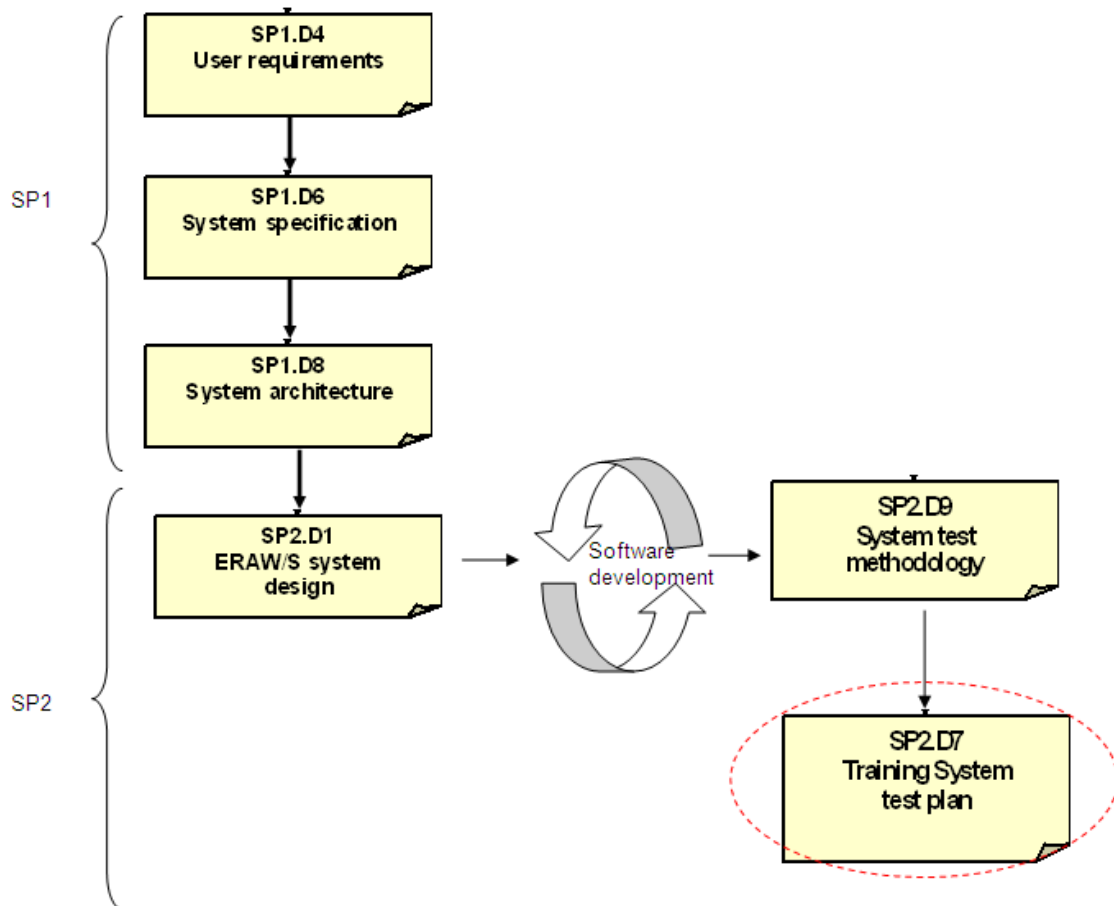


Figure 2 - Document position in project activities

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4 TEST PLAN

4.1 TEST METHODOLOGY

This document covers the Training System as a unit, and is not intended to define integration or system testing (please see footnote).

The Training system software will be tested logically in the following order;

Unit testing: The Training System was unit tested whilst the software was being developed. The objective of unit testing the Training System is to validate the correct functionality of the individual units (functions, methods and classes where applicable) that constitute the component

Integration testing¹: This phase of the testing activity will demonstrate how the Training system interfaces to the other constituent subcomponents of the CHORIST software system and how they integrate as a functional entity thus verifying that all components within the assemblage interact correctly.

System testing²: The input of this phase of the testing process will be the subcomponents that have successfully passed integration testing. The object of this testing activity is to detect any inconsistencies between the software components (or assemblages) that are integrated together thus detecting any defects both within the inter-assemblages and also within the CHORIST system as a whole. The robustness of the system will also be tested in this phase of testing activities to verify how the system operates when subjected beyond the limits of normal operation.

¹ Please see the ERAW and ERAS system test plan (SP2.D5) for integration testing i.e. a demonstration of how the Training System interfaces with other components of the CHORIST system software.

² Refer to footnote 1 above.

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4.2 **RESOURCE REQUIREMENTS**

4.2.1 **Test Environment**

4.2.1.1 **Hardware**

Standard PC

4.2.1.2 **Software**

Platform – windows

JDK – version 1.5

Java Enterprise Edition – J2EE5

Database – Postgres

GIS – MapObjects v. 2.2 by ESRI

4.3 **TESTING TASKS**

The following tasks will be performed for each test;

Test Preparation; ensuring that all pre-requisites for the test have been satisfied (e.g. the test environment has been correctly established, all requisite software correctly installed/configured),

No external changes to the software will be performed during the test.

Test Execution; ensuring that the test is conducted correctly

Test Evaluation; analysing the results of the test in order to determine whether the test has been successful as per the defined pass/fail criteria

Test Reporting; reporting the results of the test, along with any observations generated during the test

4.4 **TEST REPORT**

All test results will be documented after the test is completed. If the test failed, or if there are any undesirable observations associated with a test, then the test result will be passed to the entity responsible. Test results will be documented in a separate deliverable entitled “ERAW, ERAS and Training system test report - SP2.D10”.

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5 TEST PREPARATION

5.1 TEST CASE DESIGN

Each test will be described using the following subsections;

Test case; specifies the item to be tested, and a general description of the test

Test procedure; generally specifies the execution conditions and steps required to validate the test

5.1.1 Detailed Test Case Design

Each Test case will constitute the following subsections;

- Test Case Identifier; specifies the unique identifier associated with the test case.
- Test Item(s); the item(s) to be tested by this test case.
- Input Specifications; the values which are entered into the system for the test case.
- Output Specifications; the output (i.e. results) which are expected to be seen during the test.
- Environmental Needs; any environmental requirements specific to the test case.
- Pass/fail criteria; specifies the criteria for validating the test as passed or failed
- Test procedure reference; specifies the test procedures associated with the test case

Each test procedure will constitute the following subsections;

- Test Procedure Identifier; specifies the unique identifier associated with the test procedure.
- Purpose; specifies the purpose of the test procedure.
- Special Requirements; defines any special requirements imposed by the test procedure.
- Involved HW/SW; specifies the hardware and software required for the test
- Test data; specifies the data used for the test
- Procedure Steps; specifies the steps to follow when carrying out the test.

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6 UNIT TESTING

6.1 TRAINING SYSTEM UNIT TEST CASES

6.1.1 TC-UL-TS-FFS-001: FF Simulator Configuration

6.1.1.1 Test Item(s)

The Flash Flood Simulator

6.1.1.2 Input Specification

Two XML files named Config.xml and Llobregat.xml

6.1.1.3 Output Specification

None

6.1.1.4 Environmental Needs

N/A

6.1.1.5 Pass/Fail Criteria

The Flash Flood Simulator GUI interface will be deemed to have failed this test if it does not display the correct information from the chosen configuration.

6.1.1.6 Test Procedure Reference

TP-UL-TS-FFS-001-PC01: Default Configuration

TP-UL-TS-FFS-001-PC02: Custom Configuration

6.1.2 TC-UL-TS-FFS-002: FF Simulator Feed

6.1.2.1 Test Item(s)

The Flash Flood Simulator.

6.1.2.2 Input Specification

XML file named Config.xml

6.1.2.3 Output Specification

None

6.1.2.4 Environmental Needs

N/A

6.1.2.5 Pass/Fail Criteria

The Flash Flood Simulator GUI interface will be deemed to have failed this test if it does not feed continuously the ERAS/ERAW System.

6.1.2.6 Test Procedure Reference

TP-UL-TS-FFS-002-PC01: Feeds

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6.1.3 TC-UL-TS-TTL-001: TTL Configuration Creation

6.1.3.1 Test Item(s)

The Training Tool

6.1.3.2 Input Specification

SQLite (.db) archive file VoidScen.db

6.1.3.3 Output Specification

None

6.1.3.4 Environmental Needs

N/A

6.1.3.5 Pass/Fail Criteria

The Training Tool GUI interface will be deemed to have failed this test if it does not create and display a new Configuration

6.1.3.6 Test Procedure Reference

TP-UL-TS-TTL-001-PC01: Creation

6.1.4 TC-UL-TS-TTL-002: TTL Configuration Save and Restore

6.1.4.1 Test Item(s)

The Training Tool

6.1.4.2 Input Specification

None

6.1.4.3 Output Specification

SQLite (.db) archive file containing a saved configuration.

6.1.4.4 Environmental Needs

N/A

6.1.4.5 Pass/Fail Criteria

The Training Tool GUI interface will be deemed to have failed this test if it does not create (or replace, if one already exist) a file that stores the configuration displayed, and also if it does not reload the same configuration.

6.1.4.6 Test Procedure Reference

TP-UL-TS-TTL-002-PC01: Save and Restore

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6.1.5 TC-UL-TS-TTL-003: TTL Configuration Merge

6.1.5.1 Test Item(s)

The Training Tool

6.1.5.2 Input Specification

Two SQLite (.db) archive files containing a saved configuration.

6.1.5.3 Output Specification

SQLite (.db) archive file with a saved configuration.

6.1.5.4 Environmental Needs

N/A

6.1.5.5 Pass/Fail Criteria

The Training Tool GUI interface will be deemed to have failed this test if it does not display a new configuration sum of the two starting configurations, and also if it does not create (or replace, if one already exist) a file that stores the new configuration.

6.1.5.6 Test Procedure Reference

TP-UL-TS-TTL-003-PC01: Merge

6.1.6 TC-UL-TS-TTL-004: TTL Run Simulation

6.1.6.1 Test Item(s)

The Training Tool

6.1.6.2 Input Specification

SQLite (.db) archive files containing a saved configuration.

6.1.6.3 Output Specification

None

6.1.6.4 Environmental Needs

N/A

6.1.6.5 Pass/Fail Criteria

The Training Tool GUI interface will be deemed to have failed this test if it does not display the saved configuration, and also if it does not execute each step of the configuration loaded.

6.1.6.6 Test Procedure Reference

TP-UL-TS-TTL-004-PC01: Run

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6.2 TRAINING SYSTEM UNIT TEST PROCEDURES

6.2.1 TP-UL-TS-FFS-001-PC01: Default Configuration

6.2.1.1 Purpose

To ensure that the application runs appropriately and correctly, displaying data as defined in default configuration

6.2.1.2 Special Requirement

None

6.2.1.3 Involved HW/SW

None

6.2.1.4 Test Data

Config.xml

6.2.1.5 Procedure steps

<i>TP-UL-TS-FFS-001-PC01 Step:</i>				
<i>Step</i>	<i>Action</i>	<i>Expected Result</i>	<i>OK/not OK</i>	<i>Remarks</i>
001	Interacting with OS, run ffgui.exe	The GUI is displayed, and the sensor grid is configured as defined in the default configuration.		

6.2.2 TP-UL-TS-FFS-001-PC02: Custom Configuration

6.2.2.1 Purpose

To ensure that the application runs appropriately and correctly, displaying data as defined in the custom configuration

6.2.2.2 Special Requirement

None

6.2.2.3 Involved HW/SW

None

6.2.2.4 Test Data

Llobregat.xml

6.2.2.5 Procedure steps

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TP-UL-TS-FFS-001-PC02 Step:				
Step	Action	Expected Result	OK/not OK	Remarks
001	Interacting with OS, run ffgui.exe Llobregat.xml	The GUI is displayed, and the sensor grid is configured as defined by configuration modelled on Llobregat river.		

6.2.3 TP-UL-TS-FFS-002-PC01: Feeds

6.2.3.1 Purpose

To ensure that the application runs appropriately and correctly, feeding data to ERAS/ERAW System

6.2.3.2 Special Requirement

None

6.2.3.3 Involved HW/SW

ERAS/ERAW System

6.2.3.4 Test Data

Config.xml

6.2.3.5 Procedure steps

TP-UL-TS-FFS-002-PC01 Step:				
Step	Action	Expected Result	OK/not OK	Remarks
001	Interacting with OS, run ffgui.exe	The GUI is displayed, and the sensor grid is configured as defined by default configuration.		
002	Click on "Start Simulator" button	ERAS/ERAW begins collecting and displaying alert data from the simulator.		

6.2.4 TP-UL-TS-TTL-001-PC01: Creation

6.2.4.1 Purpose

To ensure that the application creates a new configuration

6.2.4.2 Special Requirement

None

6.2.4.3 Involved HW/SW

None

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6.2.4.4 Test Data

SQLite (.db) archive file VoidScen.db

6.2.4.5 Procedure steps

<i>TP-UL-TS-TTL-001-PC01 Step:</i>				
<i>Step</i>	<i>Action</i>	<i>Expected Result</i>	<i>OK/not OK</i>	<i>Remarks</i>
001	Interacting with OS, run chorsim.exe	The GUI is displayed, with an empty schema.		
002	Click on "Load Simulation" button	A Windows-like file system window is opened		
003	Choose VoidScen.db file	The schema in the GUI shows only one step (rectangle) named "step1"		
004	Select the "step1" box	The details of "Step 1" fill the tab control on the left.		
005	Modify data in the tab control	Each change made in the tab control is stored		Remember to fill fields "from" and "to" if an effective action is selected.
006	Create a new step: click on "New Step" button, write a name and save. (this operation can be repeated as many times as you necessary)	A new box is displayed on the schema. Tab control displays the data of the new step		It is possible to change details data as described in step 005 above.
007	Delete a step: click on "New Step" button, choose an existing step in the lower combo box, and click "Remove" button. (this operation can be repeated until there are boxes in the schema)	The box indicating the selected step is deleted from the schema.		

6.2.5 TP-UL-TS-TTL-002-PC01: Save and Restore

6.2.5.1 Purpose

To ensure the following;

- The application stores the configuration displayed in a SQLite file
- The application reloads a pre-saved configuration

6.2.5.2 Special Requirement

None

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6.2.5.3 Involved HW/SW

None

6.2.5.4 Test Data

SQLite (.db) archive file containing a saved configuration.

6.2.5.5 Procedure steps

<i>TP-UL-TS-TTL-002-PC01 Step:</i>				
<i>Step</i>	<i>Action</i>	<i>Expected Result</i>	<i>OK/not OK</i>	<i>Remarks</i>
001	Interacting with OS, run chorsim.exe, and create a configuration as described in TP-UL-TS-TTL-001-PC01: Creation	The GUI is displayed, and the schema shows the new configuration		
002	Click on "Save Simulation" button	A Windows-like file system window is opened		
003	Choose a filename and click "Save" button	A SQLite file is created (or replaced, if one already exists)		
004	Click on "Load Simulation" button	A Windows-like file system window is opened		
005	Choose a file and click "Open" button	The configuration is loaded and displayed in the "Events" schema		

6.2.6 TP-UL-TS-TTL-003-PC01: Merge

6.2.6.1 Purpose

To ensure that the application runs appropriately and correctly, merging two different schemas in one

6.2.6.2 Special Requirement

None

6.2.6.3 Involved HW/SW

None

6.2.6.4 Test Data

SQLite (.db) archive file(s) containing a saved configuration.

6.2.6.5 Procedure steps

<i>TP-UL-TS-TTL-003-PC01 Step:</i>				
<i>Step</i>	<i>Action</i>	<i>Expected Result</i>	<i>OK/not OK</i>	<i>Remarks</i>
001	Load a configuration as described in	The GUI is displayed, the		

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	procedure TP-UL-TS-TTL-002-PC01: Save and Restore	configuration is loaded and displayed in the "Events" schema		
002	Click on "Add Simulation" button	A Windows-like file system window is opened		
003	Chose a file and click "Open" button	A time shift windows is displayed		
004	Write a time shift in the box "Start after" and click "OK" (or click Cancel if you don't want a time shift)	The second configuration is loaded, in case timeshifted and merged with the first one. The result is displayed in the "Events" schema		You can enter a timeshift in seconds or in the format hh:mm:ss.
005	Optional: you can save the resulting configuration as described in procedure TP-UL-TS-TTL-002-PC01: Save and Restore	A SQLite file is created (or replaced, if one already exists)		

6.2.7 TP-UL-TS-TTL-004-PC01: Run

6.2.7.1 Purpose

To ensure that the application runs appropriately and correctly, feeding data to the ERAS/ERAW System, moving files and showing the runtime progress of executing the schema

6.2.7.2 Special Requirement

None

6.2.7.3 Involved HW/SW

ERAS/ERAW System

6.2.7.4 Test Data

TestCase.db file.

6.2.7.5 Procedure steps

<i>TP-UL-TS-TTL-004-PC01 Step:</i>				
<i>Step</i>	<i>Action</i>	<i>Expected Result</i>	<i>OK/not OK</i>	<i>Remarks</i>
001	Interacting with OS, run chorsim.exe	The GUI is displayed.		
002	Load TestCase.db as a configuration as described in procedure TP-UL-TS-TTL-002-PC01: Save and Restore	The configuration is loaded and displayed in the "Events" schema		
003	Optional: It is possible to merge other configurations as described in TP-UL-TS-TTL-003-PC01: Merge	The resultant configuration is displayed in the "Events" schema		
004	Optional: It is possible to customize your schema following instructions in TP-UL-	Changes are stored and displayed in the schema and		

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	TS-TTL-001-PC01: Creation	in tab control		
005	Click on "Start" button	The timer increases and the progress bar starts to fill. Boxes become green when active, cyan when completed correctly, and red if errors occur. When selected, post to the system ERAS/ERAW will be sent, and/or files will be moved from the origin to the destination path.		At the end of the simulation, a message box indicates the end of the simulation.
006	Click on "end" button	The GUI is closed.		

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7 APPENDIX

The following table correlates each test case with its associated test procedure(s).

Test Case	Test Procedure
TC-UL-TS-FFS-001: FF Simulator Configuration	TP-UL-TS-FFS-001-PC01: Default Configuration
	TP-UL-TS-FFS-001-PC02: Custom Configuration
TC-UL-TS-FFS-002: FF Simulator Feed	TP-UL-TS-FFS-002-PC01: Feeds
TC-UL-TS-TTL-001: TTL Configuration Creation	TP-UL-TS-TTL-001-PC01: Creation
TC-UL-TS-TTL-002: TTL Configuration Save and Restore	TP-UL-TS-TTL-002-PC01: Save and Restore
TC-UL-TS-TTL-003: TTL Configuration Merge	TP-UL-TS-TTL-003-PC01: Merge
TC-UL-TS-TTL-004: TTL Run Simulation	TP-UL-TS-TTL-004-PC01: Run