D2.4 System test cases and verification report
## Control sheet

### Version history

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<td>Authorized</td>
<td>Andy Rooke</td>
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### Circulation

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Table of contents

1 TERMS AND ABBREVIATIONS ........................................................................................................ 7
   1.1 TERMS ................................................................................................................................ 7
   1.2 ABBREVIATIONS ......................................................................................................................... 9
2 INTRODUCTION ............................................................................................................................. 11
   2.1 PURPOSE OF DOCUMENT ........................................................................................................ 11
   2.2 STRUCTURE OF DOCUMENT .................................................................................................. 11
   2.3 HEERO CONTRACTUAL REFERENCES .................................................................................. 11
3 SYSTEM TEST CASES AND VERIFICATION REPORT ................................................................ 13
   3.1 REQUIREMENTS BASED ON DOW ........................................................................................... 13
   3.2 REQUIREMENTS BASED ON STANDARDS ............................................................................ 13
      3.2.1 TEST SPECIFICATION AND METHODOLOGY .............................................................. 13
      3.2.2 IVS TESTING ...................................................................................................................... 14
      3.2.3 TEST PURPOSE FOR THE IVS ...................................................................................... 14
      3.2.4 SELECTION OF CONFORMANCE POINTS FOR THE PSAP EQUIPMENT .................... 15
      3.2.5 TEST PURPOSE FOR THE PSAP EQUIPMENT .............................................................. 16
   3.3 DESCRIPTION OF TEST SCENARIOS ..................................................................................... 16
   3.4 TEST CASES - IVS ..................................................................................................................... 18
   3.5 TEST CASES PSAP – CALL CENTRE PART .............................................................................. 33
   3.6 PSAP – CALL TAKER SW PART ............................................................................................... 63
4 LITERATURE .................................................................................................................................... 78
5 ANNEX A: MEMBER STATES RELATED SETS OF TESTS .............................................................. 79
   5.1 ROMANIA .................................................................................................................................. 79
      5.1.1 TESTING ENVIRONMENT OVERVIEW ............................................................................ 79
      5.1.2 TEST CASES ...................................................................................................................... 79
   5.2 GERMANY ................................................................................................................................. 89
      5.2.1 TESTING ENVIRONMENT OVERVIEW ............................................................................ 89
      5.2.2 TEST CASES ...................................................................................................................... 90
   5.3 FINLAND .................................................................................................................................. 94
      5.3.1 ECALL TESTING ................................................................................................................ 94
      5.3.2 TEST CASES ...................................................................................................................... 96
   5.4 CZECH REPUBLIC ..................................................................................................................... 96
      5.4.1 TESTING ENVIRONMENT OVERVIEW ............................................................................ 96
      5.4.2 TEST CASES ...................................................................................................................... 97

29/01/2013 4 Version 1.1
5.5 ITALY ........................................................................................................................................... 101
  5.5.1 TESTING ENVIRONMENT OVERVIEW ........................................................................... 101
  5.5.2 TEST CASES ...................................................................................................................... 101
5.6 GREECE .................................................................................................................................... 117
  5.6.1 LABORATORY TEST SET-UP ............................................................................................. 117
  5.6.2 TEST PROCEDURE ............................................................................................................. 118
  5.6.3 TEST CASES ...................................................................................................................... 119
5.7 SWEDEN .................................................................................................................................. 122
  5.7.1 TESTING ENVIRONMENT OVERVIEW ............................................................................. 122
  5.7.2 TEST CASES - IVS ............................................................................................................ 123
  5.7.3 TEST CASES PSAP – CALL CENTRE PART ...................................................................... 133
5.8 CROATIA .................................................................................................................................... 143
  5.8.1 CROATIAN ECALL TEST SITE ......................................................................................... 143
  5.8.2 CROATIA TEST PLANS ..................................................................................................... 144
  5.8.3 TEST CASES ...................................................................................................................... 145
5.9 NETHERLANDS .......................................................................................................................... 146
  5.9.1 INTRODUCTION .................................................................................................................. 146
  5.9.2 ECALL IVS CONFORMANCE TESTING – RADIO ACCESS (GENERAL) ......................... 149
  5.9.3 ECALL IN-BAND MODEM CONFORMANCE TESTS ......................................................... 151
  5.9.4 ECALL IVS, MNO, PSAP END-TO-END CONFORMANCE TESTS .................................. 151
6 ANNEX B: SUMMARY OF ECALL EMERGENCY SERVICE SPECIFICATIONS ....................... 158
Figures

FIGURE 1: TEST PLATFORM FOR THE ECALL MODEM AND MSD DECODER 79
FIGURE 2: GERMAN UPGRADE SCENARIO: ECALL SWITCH BOX 90
FIGURE 3: ECALL TESTING 95
FIGURE 4: CROSS BORDERS TESTS USING THE FINNISH PILOT SYSTEM ECALL SENDER AND RECEIVER PARTS. 96
FIGURE 5: TESTING ENVIRONMENT OF CZECH REPUBLIC 96
FIGURE 6: TESTING ENVIRONMENT OF ITALY 102
FIGURE 7: TESTING ENVIRONMENT OF GREECE 118
FIGURE 8: CROATIAN ECALL PILOT ARCHITECTURE 143
FIGURE 9: THE ECALL IVS LABORATORY TESTING SCENARIOS 144
FIGURE 10: ECALL SERVICE (IVS TRANSITION STATES) – PAN-EUROPEAN ECALL ‘ONLY’ CONFIGURED IVS 154
FIGURE 11: ECALL SERVICE (IVS TRANSITION STATES) – PAN-EUROPEAN ECALL + SERVICES CONFIGURED IVS 155

Tables

DESCRIPTION OF TIMERS T5 – T7 CAN BE FOUND IN D2.1 STATE OF THE ART ANALYSIS, OPERATIONAL AND FUNCTIONAL REQUIREMENTS - TABLE 1: TIMINGS. 130
TABLE 2: GSM RADIO NETWORK ACCESS NETWORK APPLICABILITY TESTS (TS 151 010) 150
TABLE 3: UMTS RADIO NETWORK ACCESS NETWORK APPLICABILITY TESTS (TS 134 123) 151
TABLE 4: CONFORMANCE TESTS FOR BOTH ECALL ‘ONLY’ AND ECALL + SERVICES CONFIGURED IVS 157
TABLE 5: ADDITIONAL CONFORMANCE TESTS FOR ECALL ‘ONLY’ CONFIGURED IVS 157
# Terms and abbreviations

## 1.1 Terms

<table>
<thead>
<tr>
<th>TERM</th>
<th>DEFINITION</th>
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<tr>
<td>112</td>
<td>single European emergency call number supporting Teleservice 12 (ETSI TS 122 003)</td>
</tr>
<tr>
<td>call clear-down</td>
<td>termination of call and freeing up of line (usually achieved by hanging up the receiver or pressing ‘end call’ or similar on screen)</td>
</tr>
<tr>
<td>cellular network</td>
<td><em>wireless communications network</em> consisting of multiple adjacent access points (cells) with the capability of homogeneous transfer of a communications session instance to an adjacent cell without significant interruption to the session</td>
</tr>
<tr>
<td>E112</td>
<td>emergency communications service using the single European emergency call number, 112, which is enhanced with location information of the calling user TS12</td>
</tr>
<tr>
<td>eCall In-band Modem (eIM)</td>
<td>Modem pair (consisting of transmitters and receivers at IVS and PSAP) that operates full-duplex and allows reliable transmission of eCall Minimum Set of Data from IVS to PSAP via the voice channel of the emergency voice call through cellular and PSTN networks.</td>
</tr>
<tr>
<td>eCall transaction</td>
<td>establishment of a <em>mobile wireless communications session</em> across a <em>public wireless communications network</em> and the transmission of a <em>minimum set of data</em> from a vehicle to a <em>public safety answering point</em> and the establishment of an audio channel between the vehicle and the PSAP</td>
</tr>
<tr>
<td>EeIP</td>
<td>European eCall Implementation Platform</td>
</tr>
<tr>
<td>eSafety</td>
<td>European Commission-sponsored forum to improve safety for European citizens</td>
</tr>
<tr>
<td>in-vehicle equipment</td>
<td>equipment within the vehicle that provides or has access to in-vehicle data required for the <em>minimum set of data</em> and any other data that is to be sent as part of or complementary to the <em>minimum set of data</em> to effect the <em>eCall transaction</em> via a <em>public mobile wireless communications network</em> providing a link between the vehicle and a means of enacting the <em>eCall service</em> via a <em>public mobile wireless communications network</em></td>
</tr>
<tr>
<td>in-vehicle system (IVS)</td>
<td><em>in-vehicle equipment</em> together with the means to trigger, manage and</td>
</tr>
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effect the eCall transaction

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tr>
<td>Minimum Set of Data (MSD)</td>
<td>standardized data concept comprising data elements of relevant vehicle generated data essential for the performance of the eCall service [EN 15722:2011]</td>
</tr>
<tr>
<td>network access device (NAD)</td>
<td>device providing communications to a mobile wireless communications network with homogeneous handover between network access points</td>
</tr>
<tr>
<td>public safety answering point (PSAP)</td>
<td>physical location working on behalf of the national authorities where emergency calls are first received under the responsibility of a public authority or a private organisation recognised by the national government</td>
</tr>
<tr>
<td>service provider</td>
<td>physical and functional component responsible for providing telematics based services to its subscribers</td>
</tr>
<tr>
<td>Teleservice 12</td>
<td>emergency service supported by PLMNs</td>
</tr>
<tr>
<td>TPS-eCall</td>
<td>Third Party Services supporting eCall. In these cases, the vehicle dials a private number to contact a call centre, which filters the call and transmits the MSD and the call to the Public Safety Answering Points in case of emergency.</td>
</tr>
<tr>
<td>VIN</td>
<td>vehicle Identification Number</td>
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# 1.2 Abbreviations

<table>
<thead>
<tr>
<th>TERM</th>
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<tr>
<td>3G</td>
<td>Third generation mobile telecommunication system</td>
</tr>
<tr>
<td>3GPP</td>
<td>Third generation partnership project</td>
</tr>
<tr>
<td>ACI</td>
<td>Automobile club d'Italia</td>
</tr>
<tr>
<td>ACK</td>
<td>Acknowledgement</td>
</tr>
<tr>
<td>AIeC</td>
<td>Automatic Initiated eCall</td>
</tr>
<tr>
<td>ASW</td>
<td>Application Software</td>
</tr>
<tr>
<td>AT</td>
<td>Attention (part of modem instruction to dial as specified in ETSI TS 127 007)</td>
</tr>
<tr>
<td>CAN</td>
<td>Controller-Area Network</td>
</tr>
<tr>
<td>CCD</td>
<td>Charge Coupled Device</td>
</tr>
<tr>
<td>CCIVR</td>
<td>Contact Center Interactive Voice Response</td>
</tr>
<tr>
<td>CRC</td>
<td>Cyclic Redundancy Check</td>
</tr>
<tr>
<td>CTI</td>
<td>Computer Telephony Integration</td>
</tr>
<tr>
<td>CTP</td>
<td>Conformance Test Procedures</td>
</tr>
<tr>
<td>EF_{FDN}</td>
<td>Elementary File (fixed dialling number)</td>
</tr>
<tr>
<td>ETSI</td>
<td>European Telecommunications Standards Institute</td>
</tr>
<tr>
<td>FMS</td>
<td>Fleet Management System</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GNSS</td>
<td>Global Navigation Satellite System</td>
</tr>
<tr>
<td>GSM</td>
<td>Global System for Mobile communications</td>
</tr>
<tr>
<td>GUI</td>
<td>Graphic User Interface</td>
</tr>
<tr>
<td>HL-ACK</td>
<td>High Level Acknowledgement</td>
</tr>
<tr>
<td>HMI</td>
<td>Human Machine Interface</td>
</tr>
<tr>
<td>ICS</td>
<td>Implementation Conformance Statement</td>
</tr>
<tr>
<td>ISDN</td>
<td>Integrated Services Digital Network</td>
</tr>
<tr>
<td>IVS</td>
<td>In-Vehicle System</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>KVP</td>
<td>Key Value Pair</td>
</tr>
<tr>
<td>LAN</td>
<td>Local Area Network</td>
</tr>
<tr>
<td>LL-ACK</td>
<td>Low Level Acknowledgement</td>
</tr>
<tr>
<td>LTE</td>
<td>Long Term Evolution (of 3G UMTS access network)</td>
</tr>
<tr>
<td>MEB</td>
<td>MSD Extractor Box</td>
</tr>
<tr>
<td>MieC</td>
<td>Manually Initiated eCall</td>
</tr>
<tr>
<td>MSC</td>
<td>Mobile Switching Centre</td>
</tr>
<tr>
<td>MNO</td>
<td>Mobile Network Operator</td>
</tr>
<tr>
<td>MSD</td>
<td>Minimum Set of Data (EN 15722)</td>
</tr>
<tr>
<td>NAD</td>
<td>Network Access Device (e.g. a GSM or UMTS module)</td>
</tr>
<tr>
<td>PAN</td>
<td>Personal Area Network</td>
</tr>
<tr>
<td>PER</td>
<td>Packed Encoding Rules (ASN.1)</td>
</tr>
<tr>
<td>PBX</td>
<td>Private Branch Exchange</td>
</tr>
<tr>
<td>PLMN</td>
<td>Public Land Mobile Network</td>
</tr>
<tr>
<td>PSAP</td>
<td>Public Safety Answering Point</td>
</tr>
<tr>
<td>RAN</td>
<td>Radio Access Network</td>
</tr>
<tr>
<td>REQ</td>
<td>Request</td>
</tr>
<tr>
<td>SIM</td>
<td>Subscriber Identity Module (GSM/3GPP)</td>
</tr>
<tr>
<td>SQL</td>
<td>Structured Query Language</td>
</tr>
<tr>
<td>TPS</td>
<td>Third Party Service</td>
</tr>
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<td>TS12</td>
<td>Teleservice 12 ETSI TS 122 003</td>
</tr>
<tr>
<td>UDP</td>
<td>User Datagram Protocol</td>
</tr>
<tr>
<td>UE</td>
<td>ECall Unit</td>
</tr>
<tr>
<td>UMTS</td>
<td>Universal Mobile Telecommunication System</td>
</tr>
<tr>
<td>USIM</td>
<td>User Subscriber Identity Module</td>
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2 Introduction

2.1 Purpose of Document

Purpose of this document is describing set of test scenarios for validation of an eCall system after development phase.

2.2 Structure of Document

This document contains an introductory part, where the philosophy of test scenarios is described together with requirements of standards. These scenarios are generally similar for all member states. Basic set of testing scenarios has been prepared during preparation is documented in chapter 3.3. A few countries will use it as a reference, other countries will use it only partly as they have prepared their own set of tests as described further in Annex A.

2.3 HeERO Contractual References

HeERO is a Pilot type A of the ICT Policy Support Programme (ICT PSP), Competitiveness and Innovation Framework Programme (CIP). It stands for Harmonised eCall European Pilot. The Grant Agreement number is 270906 and project duration is 36 months, effective from 01 January 2011 until 31 December 2013. It is a contract with the European Commission, DG CONNECT.

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Communications Networks, Content and Technology
B-1049 Brussels
Belgium

by electronic mail: CNECT-ICT-PSP-270906@ec.europa.eu
3 System test cases and verification report

3.1 Requirements based on DoW

The system verification scenarios are prepared to cover the whole eCall service-chain functionality testing just after development process is completed. These scenarios are of the same width and complexity across all of the pilot sites to ensure their functionality is replicated in a consistent manner. The scenarios cover the whole eCall chain and all required functionality. Key parameters of test scenarios are based on the WP2.3 whereas the thresholds are defined by different European standards (e.g. time duration of MSD transmission will be measured and compared to values recommended by the standards).

3.2 Requirements based on standards

The goal of testing and validation of eCall system is to validate the technological and functional properties of the eCall system.

Testing can be divided into 2 parts:

- Laboratory testing
- Testing in the real environment

For laboratory testing it is possible to set up properties and simulate border conditions which cannot be achieved in real environment.

As a second step after laboratory testing, tests will be performed in real environment to validate correct functionality and technology readiness of the eCall system.

3.2.1 Test specification and methodology

Tests will be performed based on test scenarios for these cases:

- E01 - Connection established in the case of an automatic activation
- E02 - Connection established in the case of a manual activation
- E03 - Storage of obtained coordinates
- E04 - Incomplete MSD data
- E05 - Monitoring of the eCall process
- E06 - Routing calls to the appropriate PSAP
3.2.2 **IVS testing**

IVS testing will follow requirements based on EN16062 standard intelligent transport systems - eSafety - eCall high level application requirements (HLAP).

Conformance points for the in-vehicle system are:

- Activation of pan-European eCall
- Call set-up
- MSD transfer
- Application layer ACK
- No receipt of application ACK
- Request “Send MSD”
- Check audio link to vehicle occupants
- Call clear-down
- eCall session termination
- PSAP Call back
- MSD not transmitted correctly
- PSAP modem failure before link layer LLACK is sent
- PSAP modem failure after link layer LLACK is sent
- IVS does not receive a clear-down

3.2.3 **Test purpose for the IVS**

- To verify that the IVS has the capability to be initiated via an external interface with the defined data values required for the building of the MSD.
- To verify that on power on the IVS has the capability to perform self-tests and is ready to start an eCall session in both test and operating mode.
- To verify that the IVS has the capability to react appropriately according to whether it is in operating mode or test.
- To verify that the IVS has the capability to start an eCall session in conformity to EN 16072.
To verify that the IVS has the capability to generate a MSD in conformity to EN 15722.

To verify that the IVS has the capability to initiate an E112 call with its associated relevant flags.

To verify that the eCall equipped IVS has the capability to disconnect its microphone and loudspeaker from the telephone line and send the MSD to the PSAP when the link is established.

To verify that the eCall IVS has the capability to send the latest MSD version under a PSAP request during any phase of an eCall session (resending MSD).

To verify that the IVS has the capability to connect its microphone and loudspeaker to the telephone line and maintain an audio call with the PSAP as soon as a MSD application layer acknowledgement has been received.

To verify that the IVS has the capability to terminate the link when receiving a clear-down indication from the PSAP.

To verify that the IVS has the capability to terminate an eCall session after T9 (IVS NAD minimum network registration period) following the last received clear-down from the PSAP.

To verify that, following the reception of a PSAP call back, the IVS has the capability to reconnect its audio equipment to the line and ensure audio exchange between vehicle occupants and PSAP/Rescue team operator.

To verify that the IVS has the capability to recover in case of a call clear-down failure.

To verify that the IVS has the capability to switch to TS12 mode in case of non eCall equipped PSAP or PSAP failure.

3.2.4 Selection of conformance points for the PSAP equipment

- E112 call management
- Cell position and caller ID presentation
- Test call received
- Received MSD management
- PSAP operator HMI
- Audio exchange
3.2.5 **Test purpose for the PSAP equipment**

- To verify that the PSAP application layer has the capability to receive an MSD, decode it, check that it is error free and verify its conformity to EN 15722.

- To verify that the PSAP application layer has the capability to display the MSD content and other elements, e.g. caller ID, cell position, decoded VIN to the PSAP operator as required in paragraph 7.7 of this document.

- To verify that the PSAP application layer has the capability to automatically request to its link layer the transmission of an “AL-ACK” response to the IVS.

- To verify that the PSAP application layer has the capability to request its link layer to transmit a “Send MSD” request to the IVS at any time during the eCall session.

- To verify that the PSAP application layer has the capability to request its link layer to transmit a “clear-down” request to the IVS at any time after the reception of an MSD while the E112 call stays present.

- To verify that the PSAP application layer has the capability to connect the audio system of the PSAP operator to the receiving line. Then verify that a bi-directional audio communication is achievable between the PSAP operator and the vehicle occupants.

- To verify that the PSAP application layer is behaving as expected when receiving a test call, e.g. generating a “clear-down” request to its link layer or forwarding the call to a test PSAP.

- To verify that the PSAP application layer has the capability to send a “call back” request to its link layer for the purpose of re-establishing an audio liaison between the PSAP operator / rescue team and the occupants of the vehicle (RPSAP 09).

- To verify that the PSAP application layer has the capability to request a new MSD.

### 3.3 Description of test scenarios

Basic set of test scenarios has been proposed with following structure:
# TEST SCENARIO

<table>
<thead>
<tr>
<th>Test Nr.: eCall - E01</th>
<th>Test name: Connection establishment in case of automatic e-Call activation</th>
</tr>
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### General description:
The test aims to verify application functionality where the system is automatically activated by simulating an collision. It will be observed if a connection was established, the data was transferred and voice channel established. The test will be conducted from different locations.

### Initial conditions (enter conditions):
eCall unit is in active state; service applications are running and have the necessary information (positional information, VIN, information about the type of activation of eCall, time information, information about the collision etc.). Unit is correctly set up.

### Test data:
N/A

### Test flow:
- The unit is in operational state according the specification of initial conditions.
- Vehicle crash is simulated by external trigger as an automatic activation (SW component)

### Expected result:
- Connection to PSAP is established – check the status in PSAP system
- MSD is sent to PSAP – check received data – VIN, position, time, activation type=automatic, etc.
- Voice call between eCall unit and PSAP is established

### Actual result: Complies / Not complies

### Note:

### Date: | Signature:

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29/01/2013
3.4 Test cases - IVS

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<th>TEST case area</th>
<th>Unit test : IVS</th>
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<tr>
<td>Test case ID: 001</td>
<td>Name: Test of OBU activation</td>
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**Test Description:** The OBU is activated, launch self-test and indicates status to driver

**Test steps:**
- OBU can be activated by defined change of values (e.g. ignition on / off)
- OBU launch initial testing during activation
- OBU indicates activation status to driver
- OBU indicates limited functionality in case an error occurred during initial testing

**Expected Result:** activation – initial testing – status indication

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

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<th>Tester:</th>
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29/01/2013 18 Version 1.1
### TEST case area

<table>
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<tr>
<th>Test case ID: 002</th>
<th>Name: Test of OBU activation II</th>
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**Test Description:** The OBU is activated, launch self-test and indicates status to driver

**Test steps:**
- OBU is switched on
- OBU is initiating within 10 seconds
- OBU indicates OK status to driver
- OBU indicates limited functionality in case an error occurred during initial testing

**Expected Result:** activation – initiating – status indication

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
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<th>Unit test : IVS</th>
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<td>Test case ID:</td>
<td>003</td>
</tr>
<tr>
<td>Name:</td>
<td>GNSS module test</td>
</tr>
<tr>
<td>Test Description:</td>
<td>Satellite positioning data are received and compared to reality</td>
</tr>
<tr>
<td>Test steps:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• OBU is able to acquire correct position and time from satellites</td>
</tr>
<tr>
<td></td>
<td>• OBU is able to acquire position in defined locations</td>
</tr>
<tr>
<td>Expected Result:</td>
<td>OBU position and time is calculated correctly and correctness of the position is indicated</td>
</tr>
<tr>
<td>Actual Result:</td>
<td>OK / NOK / POK</td>
</tr>
<tr>
<td>Problem Severity:</td>
<td></td>
</tr>
<tr>
<td>Problem Description:</td>
<td></td>
</tr>
<tr>
<td>Problem Resolution:</td>
<td></td>
</tr>
<tr>
<td>Notes:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td>Tester:</td>
</tr>
<tr>
<td>TEST case area</td>
<td>Unit test : IVS</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Test case ID: 004</td>
<td>Name: GSM module test</td>
</tr>
</tbody>
</table>

**Test Description:** OBU attempts to establish an emergency call over GSM

**Test steps:**
- OBU is able to connect to home GSM network
- OBU is able to send emergency setup message
- OBU is able to send the correct eCall flag in setup message
- OBU is able to indicate unavailability of the home network

**Expected Result:** OBU is able to ask for an emergency call establishment

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TEST case area</strong></td>
<td><strong>Unit test : IVS</strong></td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td><strong>Test case ID:</strong> 005</td>
<td><strong>Name:</strong> OBU reflashing test</td>
</tr>
</tbody>
</table>

**Test Description:** Upon a external request OBU is able to download new OS configuration, restart itself and load system with new data

**Test steps:**

- OBU receives request for reflash of operating system
- OBU download new data with operating system
- OBU reset s itself
- OBU starts with updated operating system/configuration

**Expected Result:** OBU is running with new OS/configuration

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th><strong>Date:</strong></th>
<th><strong>Tester:</strong></th>
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<tbody>
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<td></td>
</tr>
</tbody>
</table>
### TEST case area | Functional test : IVS - PSAP
---|---
**Test case ID:** 006 | **Name:** Test for incoming PSAP call-back request

**Test Description:** OBU is called by PSAP and it answers the call

**Test steps:**
- eCall initiation
- succesfull connecting to PSAP
- OBU is able to connect microphone and headset in case of callback
- OBU is able automatically pick up the incoming call from PSAP

**Expected Result:** OBU answers the PSAP call-back and driver and PSAP operator are able to speak each other

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>TEST case area</td>
<td></td>
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<tr>
<td>----------------</td>
<td>---</td>
</tr>
<tr>
<td>Test case ID:</td>
<td>007</td>
</tr>
<tr>
<td>Test Description:</td>
<td>OBU is requested to gather the actual data for MSD compilation</td>
</tr>
<tr>
<td>Test steps:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected Result:</td>
<td></td>
</tr>
<tr>
<td>Actual Result:</td>
<td>OK / NOK / POK</td>
</tr>
<tr>
<td>Problem Severity:</td>
<td></td>
</tr>
<tr>
<td>Problem Description:</td>
<td></td>
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<tr>
<td>Problem Resolution:</td>
<td></td>
</tr>
<tr>
<td>Notes:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td>Tester:</td>
</tr>
</tbody>
</table>
### TEST case area

<table>
<thead>
<tr>
<th>Functional test : IVS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> 008</td>
</tr>
</tbody>
</table>

**Test Description:** eCall is manually and automatically initiated

**Test steps:**

- The activation of the manual eCall button for the defined period of time causes a manually triggered eCall
- In case the OBU receives a threshold value from an external sensor, it triggers automatic eCall
- In case the OBU measures or calculates a threshold value from an internal sensor, it triggers the automatic eCall
- eCall triggering is indicated to driver

**Expected Result:** eCall is only launched upon the request of the defined criteria

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
### Functional test : IVS

<table>
<thead>
<tr>
<th>Test case area</th>
<th>Test case ID: 009</th>
<th>Name: eCall triggering test II</th>
</tr>
</thead>
</table>

**Test Description:** eCall is triggered manually and automatically

**Test steps:**
- “Automatic triggering” of eCall can be simulated (e.g., by pushing button twice within one second)
- Manual triggering of eCall will be activated by button
- eCall triggering is indicated to driver

**Expected Result:** eCall is activated by pushing button

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
## Functional test: IVS

**Test case ID:** 010  
**Name:** Test of non-interruption of the established eCall

**Test Description:** During an established eCall – the manual eCall button is pushed repeatedly, GPRS communication is launched and engine is turned off

**Test steps:**
- An established eCall is not interrupted by triggering of another eCall
- An established eCall is not interrupted by another OBU communication or OBU services
- An established eCall is not interrupted by ignition off

**Expected Result:** The established eCall is not interrupted

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**  
**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Functional test : IVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 011</td>
<td>Name: Test of operating requirements for error handling</td>
</tr>
</tbody>
</table>

**Test Description:** eCall is ringing, then established, then interrupted, then established again within 120 second, but MSD not received

**Test steps:**
- In case the call is established and “ringing”, the OBU shall maintain the connection for at least 60 seconds to allow the PSAP to answer
- In case the established eCall is interrupted, the OBU attempts to re-establish the eCall for maximum period of time 120 seconds
- In case the data transmission fails, the OBU shall be able to attempt to establish E112 call

**Expected Result:** All the timing is observed and in case of data transmission error, the E112 call is established

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

29/01/2013
## TEST case area

<table>
<thead>
<tr>
<th>Functional test : IVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 012</td>
</tr>
<tr>
<td>Name: eCall termination test</td>
</tr>
</tbody>
</table>

### Test Description:
During established eCall a clear-down and/or proper signalization is received

### Test steps:
- OBU is able to terminate an eCall as soon as clear down is received
- OBU is able to terminate a call as soon as the appropriate signalization from GSM network is received

### Expected Result:
eCall is correctly finished

### Actual Result:
OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
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<tbody>
<tr>
<td>29/01/2013</td>
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</tbody>
</table>
Area: In-band modem functions

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Functional test : IVS In-band modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 013</td>
<td>Name: In-band modem basic functionality test</td>
</tr>
</tbody>
</table>

**Test Description:** OBU has received request for MSD and it synchronise in-band modems

**Test steps:**
- OBU is able to start in-band modem communication upon both “push” and “pull” request
- In-band modem is able to synchronise itself with PSAP modem
- OBU is able to automatically disconnect microphone and headset during an in-band modem communication and automatically connect microphone and headset during a voice communication

**Expected Result:** OBU in-band modem is able to communicate with PSAP in-band modem

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Test case area</td>
<td>Functional test : IVS In-band modem</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Test case ID:</td>
<td>014</td>
</tr>
<tr>
<td>Name:</td>
<td>Test of MSD sending</td>
</tr>
</tbody>
</table>

**Test Description:** OBU transmits MSD to PSAP

**Test steps:**
- In-band modem begins to send MSD as soon as it receives three consecutive START messages
- In-band modem stops sending of MSD as soon as it receives two consecutive AL-ACK messages
- As soon as the MSD reception is indicated, the OBU reconnects microphone and headset for the voice communication

**Expected Result:** MSD is correctly received

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Functional test : IVS In-band modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 015</td>
<td>Name: Test of maximum duration of in-band modem messages transmission</td>
</tr>
<tr>
<td>Test Description:</td>
<td>During in-band modem communication some of the messages are delayed</td>
</tr>
</tbody>
</table>

**Test steps:**

- After the INITIATION message is received and a START message is not delivered within 2 seconds, the in-band modem terminates the communication
- If an AL-ACK message is not received within 5 seconds from receipt of the LL-ACK, the in-band modem terminates the communication
- If the LL-ACK is not delivered within 20 second from the start of MSD transmission, the in-band modem terminates the communication
- If OBU does not receive a clear-down, it terminates the call when timer has reached 60 minutes

**Expected Result:** After a timing ends up, the E112 voice call is established

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

29/01/2013 32 Version 1.1
3.5 Test cases PSAP – call centre part

Testing of eCall HeERO PSAP call centre part is mainly focused on:

1. Functional tests of PSAP modem; TSID 101 – 108
2. Integration test PSAP modem – PSAP application (hosted in CCIVR); TSID 201 – 211
3. Integration test PBX – IVR – Genesys CTI; TSID 301 – 311

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : PSAP modem</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> 101</td>
<td><strong>Name:</strong> IVS calls 112 with correct MSD</td>
</tr>
</tbody>
</table>

**Test Description:**

IVS calls the PSAP and transmits the correct MSD

**Test steps:**

- PSAP is in communication with the IVS
- PSAP modem collects the MSD
- PSAP modem sends LL-ACK to the IVS with the positive status
- PSAP modem checks the validity of the MSD data by sending UDP request to the CCIVR
- PSAP modem sends HL-ACK to the IVS with the positive status
- PSAP modem transfers the call to the CCIVR application

**Expected Result:**

PSAP CCIVR connector has received the MSD results.

CCIVR application will receive the call to attach MSD data.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : PSAP modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 102</td>
<td>Name: Operator needs to update MSD</td>
</tr>
</tbody>
</table>

**Test Description:**
IVS is in communication with the operator and the operator transfers the call to the PSAP modem (CCIVR).

**Test steps:**
- PSAP modem initiates the communication with the IVS and requests for a new MSD collection
- PSAP modem collects the MSD
- PSAP modem sends LL-ACK to the IVS with the positive status
- PSAP modem checks the validity of the MSD data and sends the agent number by sending UDP request to the CCIVR
- PSAP modem sends HL-ACK to the IVS with the positive status
- PSAP modem transfers the call to the CCIVR application

**Expected Result:**
- PSAP CCIVR connector has received the MSD results.
- PSAP CCIVR connector has received the agent number.
- CCIVR application will receive the call to attach MSD data.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**  

**Tester:**
### TEST case area: Unit test: PSAP modem

<table>
<thead>
<tr>
<th>Test case ID: 103</th>
<th>Name: IVS calls 112 with invalid MSD</th>
</tr>
</thead>
</table>

**Test Description:**

IVS calls the PSAP and sends invalid MSD. Invalid MSD will be generated by IVS firmware.

**Test steps:**

- PSAP is in communication with the IVS
- PSAP modem collects the MSD
- PSAP modem sends LL-ACK to the IVS with the positive status
- PSAP modem checks the validity of the MSD data by sending UDP request to the CCIVR
- PSAP modem waits timeout T6
- PSAP modem transfers the call to the CCIVR application

**Expected Result:**

PSAP CCIVR connector has detected bad MSD results.

CCIVR application will receive the call to attach 'MSD_ERROR_INVALID_DATA'.

**Actual Result:**  OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** 29/01/2013  
**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : PSAP modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 104</td>
<td>Name: Update MSD with invalid MSD</td>
</tr>
</tbody>
</table>

**Test Description:**
IVS is in communication with the operator and the operator transfers the call to the PSAP.

**Test steps:**
- PSAP modem initiates the communication with the IVS and sends a request for a new MSD collection
- PSAP modem collects the MSD
- PSAP modem sends LL-ACK to the IVS with the positive status
- PSAP modem checks the validity of the MSD data and sends the agent number by sending UDP request to the CCIVR
- PSAP modem waits timeout T6
- PSAP modem transfers the call to the CCIVR application

**Expected Result:**
PSAP CCIVR connector has detected bad MSD results.
PSAP CCIVR connector has received the agent number.
CCIVR application will receive the call to attach 'MSD_ERROR_INVALID_DATA'.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
### TEST case area

<table>
<thead>
<tr>
<th>Test case ID: 105</th>
<th>Name: IVS calls 112 with invalid CRC</th>
</tr>
</thead>
</table>

### Test Description:

IVS calls the PSAP and sends a wrong CRC. Wrong CRC will be generated by IVS firmware.

### Test steps:

- PSAP is in communication with the IVS
- PSAP modem collects the MSD
- PSAP modem detects CRC errors and send to the CCIVR a 'MSD_ERROR_INVALID_CRC' message by UDP request
- PSAP modem waits timeout T8
- PSAP modem transfers the call to the CCIVR application

### Expected Result:

PSAP CCIVR connector has received 'MSD_ERROR_INVALID_CRC' message.

CCIVR application will receive the call to attach 'MSD_ERROR_INVALID_CRC'.

### Actual Result: OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
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<tbody>
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<td></td>
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</tr>
</tbody>
</table>
## TEST case area

| Test case ID: 106 | Name: Update MSD with invalid CRC |

## Test Description:
IVS is in communication with the operator and the operator transfers the call to the PSAP.

## Test steps:
- PSAP modem initiates the communication with the IVS and request for a new MSD collection
- PSAP modem collects the MSD
- PSAP modem detects CRC errors and send to the CCIVR a 'MSD_ERROR_INVALID_CRC' message by UDP request
- PSAP modem waits timeout T8
- PSAP modem transfers the call to the CCIVR application

## Expected Result:
- PSAP CCIVR connector has received 'MSD_ERROR_INVALID_CRC' message.
- PSAP CCIVR connector has received the agent number.
- CCIVR application will receive the call to attach 'MSD_ERROR_INVALID_CRC'.

## Actual Result: OK / NOK / POK

## Problem Severity:

## Problem Description:

## Problem Resolution:

## Notes:

| Date: | Tester: |
## TEST case area | Unit test : PSAP modem
---|---
### Test case ID: 107 | Name: PSAP callback

**Test Description:**
Operator is in communication with IVS and the operator transfer the call to the PSAP modem (CCIVR).

**Test steps:**
- PSAP modem initiates the communication with the IVS and request for an MSD collection
- PSAP modem collects the MSD
- PSAP modem sends LL-ACK to the IVS with the positive status
- PSAP modem checks the validity of the MSD data and send the agent number by sending UDP request to the CCIVR
- PSAP modem sends HL-ACK to the IVS with the positive status
- PSAP modem transfers the call to the CCIVR application

**Expected Result:**
PSAP CCIVR connector has received the MSD results.
PSAP CCIVR connector has received the agent number.
CCIVR application will receive the call to attach MSD data.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** | **Tester:**
### Test Case Area

<table>
<thead>
<tr>
<th>Test case ID: 108</th>
<th>Name: Initiation error</th>
</tr>
</thead>
</table>

### Test Description:

IVS calls the PSAP but the initiation step is not correctly received.

### Test Steps:

- PSAP is in communication with the IVS
- PSAP modem does not receive any INITATION message
- PSAP modem waits timeout T4
- PSAP modem transfers the call to the CCIVR application

### Expected Result:

PSAP CCIVR connector has received 'INITIATION_TIMEOUT' message.
CCIVR application will receive the call to attach 'INITIATION_TIMEOUT'.

### Actual Result:

OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

### Date: Tester:
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : PSAP modem – PSAP application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 201</td>
<td>Name: IVS call 112 with correct MSD</td>
</tr>
</tbody>
</table>

**Test Description:**

IVS calls the PSAP and sends correct MSD.

**Test PSAP modem steps:**

- PSAP modem was in communication with the IVS
- PSAP modem has collected MSD
- PSAP modem has sent MSD to the PSAP CCIVR connector
- PSAP modem has transferred the call to the CCIVR application

**Test PSAP application steps:**

- CCIVR application answers to the IVS call
- CCIVR application retrieves MSD information from the CCIVR PSAP connector
- CCIVR application attaches all information to the call
- CCIVR application routes the call to operator pilot

**Expected Result:**

The call has been routed to a CCD agent pilot.

TServer has all MSD data attached to the call.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** 29/01/2013

**Tester:**
## Test Description:

The IVS calls the PSAP and sends a test MSD.

### Test PSAP modem steps:

- PSAP was in communication with the IVS
- PSAP modem has collected the MSD
- PSAP modem has sent MSD to the PSAP CCIVR connector
- PSAP modem has transferred the call to the CCIVR application

### Test PSAP application steps:

- CCIVR application answers to the IVS call
- CCIVR application retrieves MSD information from the CCIVR PSAP connector
- CCIVR application attaches all information and 'TEST_ECALL_SCENARIO' to the call
- CCIVR application routes the call to a test CCD pilot

## Expected Result:

The call has been routed to a CCD test pilot.

TServer has all MSD data attached to the call.

The value of the KVP TEST_ECALL_SCENARIO is 1.

## Actual Result: OK / NOK / POK

## Problem Severity:

## Problem Description:

## Problem Resolution:

## Notes:

<p>| Date: | Tester: |</p>
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : PSAP modem – PSAP application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 203</td>
<td>Name: Operator need to update MSD</td>
</tr>
<tr>
<td><strong>Test Description:</strong></td>
<td></td>
</tr>
<tr>
<td>The IVS is in communication with the operator and the operator transfers the call to the PSAP.</td>
<td></td>
</tr>
<tr>
<td><strong>Test PSAP modem steps:</strong></td>
<td></td>
</tr>
<tr>
<td>• IVS was in communication with the operator</td>
<td></td>
</tr>
<tr>
<td>• operator has transfer the IVS call to the PSAP modem</td>
<td></td>
</tr>
<tr>
<td>• PSAP modem has collected MSD</td>
<td></td>
</tr>
<tr>
<td>• PSAP modem has sent MSD and the agent number to the PSAP CCIVR connector</td>
<td></td>
</tr>
<tr>
<td>• PSAP modem has transferred the call to the CCIVR application</td>
<td></td>
</tr>
<tr>
<td><strong>Test PSAP application steps:</strong></td>
<td></td>
</tr>
<tr>
<td>• CCIVR application answers to the IVS call</td>
<td></td>
</tr>
<tr>
<td>• CCIVR application retrieves MSD information from the CCIVR PSAP connector</td>
<td></td>
</tr>
<tr>
<td>• CCIVR application attaches all information to the call</td>
<td></td>
</tr>
<tr>
<td>• CCIVR application routes the call to the agent number</td>
<td></td>
</tr>
<tr>
<td><strong>Expected Result:</strong></td>
<td></td>
</tr>
<tr>
<td>The agent can take the call back.</td>
<td></td>
</tr>
<tr>
<td>TServer has all MSD data attached to the call.</td>
<td></td>
</tr>
<tr>
<td><strong>Actual Result:</strong></td>
<td>OK / NOK / POK</td>
</tr>
<tr>
<td><strong>Problem Severity:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Problem Description:</strong></td>
<td></td>
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<tr>
<td><strong>Problem Resolution:</strong></td>
<td></td>
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<tr>
<td><strong>Notes:</strong></td>
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<tr>
<td><strong>Date:</strong></td>
<td><strong>Tester:</strong></td>
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</tbody>
</table>
### TEST case area

<table>
<thead>
<tr>
<th>Integration test : PSAP modem – PSAP application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> 204</td>
</tr>
</tbody>
</table>

**Test Description:**

The IVS is in communication with the operator and the operator transfers the call to the PSAP but the agent is busy when the call is coming back.

**Test PSAP modem steps:**

- IVS was in communication with the operator
- Operator has transferred the IVS call to the PSAP modem
- PSAP modem has collected MSD
- PSAP modem has sent MSD and the agent number to the PSAP CCIVR connector
- PSAP modem has transferred the call to the CCIVR application

**Test PSAP application steps:**

- CCIVR application answers to the IVS call
- CCIVR application retrieves MSD information from the CCIVR PSAP connector
- CCIVR application attaches all information to the call
- CCIVR application routes the call to the agent number but he is busy
- CCIVR application routes the call to operator pilot

**Expected Result:**

The call has been routed to a CCD agent pilot.

TServer has all MSD data attached to the call.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>TEST case area</td>
<td>Integration test : PSAP modem – PSAP application</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Test case ID: 205</td>
<td>Name: IVS call 112 with invalid MSD</td>
</tr>
</tbody>
</table>

**Test Description:**

The IVS calls the PSAP and sends invalid MSD.

**Test PSAP modem steps:**

- IVS was in communication with the operator
- operator has transferred the IVS call to the PSAP modem
- PSAP modem has collected MSD
- PSAP modem has sent MSD to the PSAP CCIVR connector
- PSAP CCIVR connector has detected invalid data
- PSAP modem has waited for timeout T6
- PSAP modem has transferred the call to the CCIVR application

**Test PSAP application steps:**

- CCIVR application answers to the IVS call
- CCIVR application retrieves invalid data from the CCIVR PSAP connector
- CCIVR application attaches 'MSD_ERROR_INVALID_DATA' to the call
- CCIVR application routes the call to operator pilot

**Expected Result:**

The call has been routed to a CCD agent pilot.

TServer has a KVP 'MSD_ERROR_INVALID_DATA' set to 1.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

29/01/2013 45 Version 1.1
**TEST case area** | **Integration test : PSAP modem – PSAP application**
---|---
Test case ID: 206 | Name: Update MSD with invalid MSD

**Test Description:**
IVS is in communication with the operator and the operator transfers the call to the PSAP.

**Test PSAP modem steps:**
- IVS was in communication with the operator
- Operator has transfer the IVS call to the PSAP modem
- PSAP modem has collects MSD
- PSAP modem has sent MSD and the agent number to the PSAP CCIVR connector
- PSAP CCIVR connector has detect invalid data
- PSAP modem has wait for timeout T6
- PSAP modem has transfer the call to the CCIVR application

**Test PSAP application steps:**
- CCIVR application answer to the IVS call
- CCIVR application retrieves invalid data form the CCIVR PSAP connector
- CCIVR application attaches 'MSD_ERROR_INVALID_DATA' to the call
- CCIVR application routes the call to operator pilot

**Expected Result:**
The call has been routed to a CCD agent pilot.

TServer has a KVP 'MSD_ERROR_INVALID_DATA' sets to 1.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
### TEST case area

<table>
<thead>
<tr>
<th>Integration test : PSAP modem – PSAP application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> 207</td>
</tr>
</tbody>
</table>

### Test Description:

IVS calls the PSAP and sends a wrong CRC.

### Test PSAP modem steps:

- IVS was in communication with the operator
- PSAP modem has detected invalid CRC
- PSAP modem has sent ‘MSD_ERROR_INVALID_CRC’ to the PSAP CCIVR connector
- PSAP modem has waited for timeout T8
- PSAP modem has transferred the call to the CCIVR application

### Test PSAP application steps:

- CCIVR application answers to the IVS call
- CCIVR application retrieves invalid CRC form the CCIVR PSAP connector
- CCIVR application attaches ‘MSD_ERRORINVALID_CRC’ to the call
- CCIVR application routes the call to operator pilot

### Expected Result:

The call has been routed to a CCD agent pilot.

TServer has a KVP ‘MSD_ERRORINVALID_CRC’ sets to 1.

### Actual Result: OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

### Date: | Tester:
<table>
<thead>
<tr>
<th>Test case area</th>
<th>Integration test : PSAP modem – PSAP application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 208</td>
<td>Name: Update MSD with invalid CRC</td>
</tr>
</tbody>
</table>

**Test Description:**

IVS is in communication with the operator and the operator transfers the call to the PSAP.

**Test PSAP modem steps:**

- IVS was in communication with the operator
- Operator has transferred the IVS call to the PSAP modem
- PSAP modem has detected invalid CRC
- PSAP modem has sent 'MSD_ERROR_INVALID_CRC' to the PSAP CCIVR connector
- PSAP modem has waited for timeout T8
- PSAP modem has transferred the call to the CCIVR application

**Test PSAP application steps:**

- CCIVR application answers to the IVS call
- CCIVR application retrieves invalid CRC form the CCIVR PSAP connector
- CCIVR application attaches 'MSD_ERROR_INVALID_CRC' to the call
- CCIVR application routes the call to the agent number but he is busy
- CCIVR application routes the call to operator pilot

**Expected Result:**

The call has been routed to a CCD agent pilot.

TServer has a KVP 'MSD_ERROR_INVALID_CRC' sets to 1.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
## TEST case area

<table>
<thead>
<tr>
<th>Integration test : PSAP modem – PSAP application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 209</td>
</tr>
</tbody>
</table>

### Test Description:
PSAP call back to IVS, operator requests MSD.

### Test PSAP modem steps:
- IVS was in communication with the operator
- Operator has transfer the IVS call to the PSAP modem
- PSAP modem has collected MSD
- PSAP modem has sent MSD and the agent number to the PSAP CCIVR connector
- PSAP modem has transferred the call to the CCIVR application

### Test PSAP application steps:
- CCIVR application answers to the IVS call
- CCIVR application retrieves MSD information from the CCIVR PSAP connector
- CCIVR application attaches all information to the call
- CCIVR application routes the call to operator pilot

### Expected Result:
The agent can take the call back.
TServer has all MSD data attached to the call.

### Actual Result:  OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

### Date: | Tester:
---------|---------

29/01/2013

49

Version 1.1
## TEST case area

<table>
<thead>
<tr>
<th>Integration test : PSAP modem – PSAP application</th>
</tr>
</thead>
</table>

| Test case ID: 210 | Name: PSAP callback – agent busy |

### Test Description:

PSAP callback but the agent is busy when the call is coming back.

### Test PSAP modem steps:

- IVS was in communication with the operator
- Operator has transferred the IVS call to the PSAP modem
- PSAP modem has collected MSD
- PSAP modem has sent MSD and the agent number to the PSAP CCIVR connector
- PSAP modem has transferred the call to the CCIVR application

### Test PSAP application steps:

- CCIVR application answers to the IVS call
- CCIVR application retrieves MSD information from the CCIVR PSAP connector
- CCIVR application attaches all information to the call
- CCIVR application routes the call to the agent number but he is busy
- CCIVR application routes the call to operator pilot

### Expected Result:

The call has been routed to a CCD agent pilot.

The TServer has all MSD data attached to the call.

### Actual Result:  OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

### Date:  

| Tester: |  

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29/01/2013  50  Version 1.1
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : PSAP modem – PSAP application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> 211</td>
<td><strong>Name:</strong> Initiation error</td>
</tr>
</tbody>
</table>

**Test Description:**
IVS calls the PSAP but the initiation step is not correctly received.

**Test PSAP modem steps:**
- The IVS was in communication with the operator
- The PSAP modem has sent 'INITIATION_TIMEOUT' to the PSAP CCIVR connector
- The PSAP modem has waited for timeout T4
- The PSAP modem has transferred the call to the CCIVR application

**Test PSAP application steps:**
- The CCIVR application answers to the IVS call
- The CCIVR application retrieves initiation timeout error from the CCIVR PSAP connector
- The CCIVR application attaches 'INITIATION_TIMEOUT' to the call
- The CCIVR application routes the call to operator pilot

**Expected Result:**
The call has been routed to a CCD agent pilot.
TServer has a KVP 'INITIATION_TIMEOUT' sets to 1.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** [Date]  **Tester:** [Tester]
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : PBX - IVR - Genesys CTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 301</td>
<td>Name: IVS calls the PSAP and sends correct complete MSD</td>
</tr>
</tbody>
</table>

**Test Description:**

To verify that the eCall equipped PSAP application layer has the capability to receive an MSD, decode it, check that it is error free and verify its conformity, the PSAP application layer has the capability to present it to the ASW client.

**Test steps:**

- eCall is received on PBX and routed to PSAP modem and CCIVR (PSAP application)
- PSAP application receives MSD
- MSD is attached as KVPs
- eCall is routed to operator

**Expected Result:**

PSAP application is in communication with the IVS.
There are KVPs on Genesys EventRinging.
Operator is in communication with the vehicle occupants.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : PBX - IVR - Genesys CTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 302</td>
<td>Name: IVS calls the PSAP and send correct mandatory MSD</td>
</tr>
</tbody>
</table>

**Test Description:**

To verify that the eCall equipped PSAP application layer has the capability to receive an MSD, decode it, check its error free and verify its conformity, the PSAP application layer has the capability to present it to the ASW client.

**Test steps:**

- eCall is received on PBX and routed to PSAP modem and CCIVR (PSAP application)
- PSAP application receives MSD
- MSD is attached as KVPs
- eCall is routed to operator

**Expected Result:**

PSAP application is in communication with the IVS.

There are Mandatory KVPs on Genesys EventRinging.

The operator is in communication with the vehicle occupants.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : PBX - IVR - Genesys CTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 303</td>
<td>Name: Operator requests to update MSD</td>
</tr>
</tbody>
</table>

**Test Description:**
Test that at any time during an eCall session PSAP operator can request an MSD resend to its application layer.

**Test steps:**
- ASW client requests to transfer a call to PSAP modem
- call is routed to PSAP modem
- PSAP application receives MSD
- MSD is attached as KVPs
- eCall is routed back from CCIVR to original operator

**Expected Result:**
eCall is transferred to PSAP modem, Operator is in "withdrawal" state.
PSAP modem picks up the eCall.
PSAP application is in communication with the IVS.
There are KVPs on Genesys EventRinging.
The original operator is again in communication with the vehicle occupants.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : PBX - IVR - Genesys CTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 304</td>
<td>Name: Operator requests a call clear-down</td>
</tr>
</tbody>
</table>

**Test Description:**
Test that at any time, PSAP operator has the capability to request a call clear-down to the IVS.

**Test steps:**
- Operator requests to hang up the call
- The call is clear-down

**Expected Result:**
ASW sends clear-down request to Genesys Tserver.
The communication with vehicle occupants is finished.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
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</table>

29/01/2013 55 Version 1.1
**Test Description:**
Test that during a period of nn minutes (as determined in EN 16072) PSAP operator can issue a call-back request to its application layer.

**Test steps:**
- Operator requests a callback to IVS ID number
- IVS answers the call
- Operator/ASW client requests to transfer a call to CCIVR
- call is routed to PSAP modem
- PSAP application receives MSD
- MSD is attached as KVPs
- eCall is routed back from CCIVR to original operator

**Expected Result:**
ASW client requests Genesys Tserver to dial IVS ID number.
The operator is in communication with the vehicle occupants.
eCall is transferred to PSAP modem, operator is in "withdrawal" state.
PSAP modem picks up the eCall.
PSAP application is in communication with the IVS.
There are KVPs on Genesys EventRinging.
The original operator is again in communication with the vehicle occupants.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Tester</th>
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<tbody>
<tr>
<td>29/01/2013</td>
<td></td>
</tr>
</tbody>
</table>
**TEST case area** | **Integration test : PBX - IVR - Genesys CTI**
---|---
Test case ID: 306 | Name: IVS calls the PSAP with invalid CRC

**Test Description:**
Test that if a MSD message is not properly received (invalid CRC or T8 run out), the eCall is directly connected to the PSAP operator without responding to the link layer.

**Test steps:**
- eCall is received on PBX and routed to PSAP modem and CCIVR (PSAP application)
- T8 run out (CRC checking failed)
- CCIVR routes eCall to operator

**Expected Result:**
PSAP application is in communication with the IVS.
There are KVPs on Genesys EventRinging - MSD_ERROR_INVALID_CRC, MSD_TIMEOUT.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** 29/01/2013  |  **Tester:**
## TEST case area

<table>
<thead>
<tr>
<th>Integration test : PBX - IVR - Genesys CTI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID: 307</strong></td>
</tr>
</tbody>
</table>

### Test Description:

Test that if the PSAP application layer receives a "MSD failure" and directly establish a voice liaison between the PSAP operator and the vehicle occupants.

### Test steps:

- eCall is received on PBX and routed to PSAP modem and CCIVR (PSAP application)
- MSD checking failed - T6 runout
- CCIVR routes eCall to operator

### Expected Result:

PSAP application is in communication with the IVS.

There is KVP on Genesys EventRinging - MSD_ERROR_INVALID_DATA.

### Actual Result: OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

### Date: Tester:
### Integration test: PBX - IVR - Genesys CTI

<table>
<thead>
<tr>
<th>Test case ID: 308</th>
<th>Name: IVS call the PSAP with initiation timeout</th>
</tr>
</thead>
</table>

#### Test Description:
Test that if an initiation timeout runs out, the eCall is directly connected to the PSAP operator without responding to the link layer.

#### Test steps:
- eCall is received on PBX and routed to PSAP modem and CCIVR (PSAP application)
- Initiation timeout runout - T4
- CCIVR routes eCall to operator

#### Expected Result:
PSAP application is in communication with the IVS.
There is KVP on Genesys EventRinging - INITIATION_TIMEOUT.

#### Actual Result: OK / NOK / POK

#### Problem Severity:

#### Problem Description:

#### Problem Resolution:

#### Notes:

#### Date: | Tester:
# System test cases and verification report

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : PBX - IVR - Genesys CTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 309</td>
<td>Name: IVS calls PSAP with invalid CRC, operator requests MSD update</td>
</tr>
</tbody>
</table>

## Test Description:

Test that if a MSD message is not properly received (invalid CRC or T8 runout), the eCall is directly connected to the PSAP operator without responding to the link layer. Then PSAP has the capability to issue to its link layer a resend MSD request.

## Test steps:

- eCall is received on PBX and routed to PSAP modem and CCIVR (PSAP application)
- T8 run out (CRC checking failed)
- CCIVR routes eCall to operator
- ASW client requests to transfer a call to CCIVR
- call is routed to PSAP modem
- PSAP application receives MSD
- MSD is attached as KVPs
- eCall is routed back from CCIVR to original operator

## Expected Result:

PSAP application is in communication with the IVS.

There are KVPs on Genesys EventRinging - MSD_ERROR_INVALID_CRC, MSD_TIMEOUT.

eCall is transferred to PSAP modem, Operator is in "withdrawal" state.

PSAP modem picks up the eCall.

PSAP application is in communication with the IVS.

There are KVPs on Genesys EventRinging (Complete MSD). The original operator is again in communication with the vehicle occupants.

## Actual Result:  OK / NOK / POK

## Problem Severity:

## Problem Description:

## Problem Resolution:

## Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

29/01/2013
**TEST case area** | **Integration test : PBX - IVR - Genesys CTI**
--- | ---
Test case ID: 310 | Name: IVS calls PSAP with invalid MSD, operator requests MSD update

**Test Description:**
Test that if the PSAP application layer receives a “MSD failure” and directly establishes a voice liaison between the PSAP operator and the vehicle occupants, then PSAP has the capability to issue to its link layer a resend MSD request.

**Test steps:**
- eCall is received on PBX and routed to PSAP modem and CCIVR (PSAP application)
- MSD checking failed - T6 runout
- CCIVR routes eCall to operator
- ASW client request to transfer a call to CCIVR
- call is routed to PSAP modem
- PSAP application receives MSD
- MSD is attached as KVPs
- eCall is routed back from CCIVR to original operator

**Expected Result:**
PSAP application is in communication with the IVS.
There is KVP on Genesys EventRinging - MSD_ERROR_INVALID_DATA.
eCall is transferred to PSAP modem, operator is in "withdrawal" state.
PSAP modem picks up the eCall.
PSAP application is in communication with the IVS.
There are KVPs on Genesys EventRinging (complete MSD).
The original operator is again in communication with the vehicle occupants.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** | **Tester:**
--- | ---

29/01/2013 | 61 | Version 1.1
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : PBX - IVR - Genesys CTI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID: 311</strong></td>
<td><strong>Name:</strong> IVS calls PSAP with initiation timeout, operator requests MSD update</td>
</tr>
</tbody>
</table>

**Test Description:**
Test that if a initiation timeout run out, the eCall is directly connect to the PSAP operator without responding to the link layer, then PSAP has the capability to issue to its link layer a resend MSD request.

**Test steps:**
- eCall is received on PBX and routed to PSAP modem and CCIVR (PSAP application)
- Initiation timeout run out - T4
- CCIVR routes eCall to operator
- ASW client requests to transfer a call to CCIVR
- call is routed to PSAP modem
- PSAP application receives MSD
- MSD is attached as KVPs
- eCall is routed back from CCIVR to original operator

**Expected Result:**
PSAP application is in communication with the IVS.
There is KVP on Genesys EventRinging - INITIATION_TIMEOUT.
eCall is transferred to PSAP modem, operator is in "withdrawal" state.
PSAP modem picks up the eCall.
PSAP application is in communication with the IVS.
There are KVPs on Genesys EventRinging (complete MSD).
The original operator is again in communication with the vehicle occupants.

**Actual Result:** OK / NOK / POK

**Problem Severity:**
**Problem Description:**
**Problem Resolution:**
**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
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<tbody>
<tr>
<td>29/01/2013</td>
<td>62</td>
</tr>
</tbody>
</table>
3.6 PSAP – Call Taker SW part

Testing of eCall HeERO PSAP call taker SW part consists of the following areas:

1. Functional tests (TSID 401 – 408) – MSD simulator is used instead of IVS
2. Integration test (TSID 501 – 505)
   • test with PSAP call centre part (eCall reception, new MSD request, callback,...)
   • test with VIN decoder
   • test with ECC systems
   • test with TMC system
3. Robustness tests
4. Load tests
## Test Case Area

### Unit Test: PSAP Application Part – MSD Simulator

<table>
<thead>
<tr>
<th>Test case ID: 401</th>
<th>Name: MSD simulator activation</th>
</tr>
</thead>
</table>

### Test Description:

Test data input and eCall simulation activation

### Test Steps:

Testing call taker workplace:

- start of System Administrator application
- selection of task: Telephones – Telephony simulation
- test data input via test form (inserted data could be changed by SQL Loader)
- set up activation for any record to value “YES”

Testing application server:

- change of register key for CTICallAgent (Call_Simulation_eCall) service - value 1
- restart of CTICallAgent service

### Expected Result:

Initiation of System Administrator service.
Initiation of telephony simulation task.
Change or data insert via task form.
After the restart in the application log – info about turned on simulation and first row of simulation data download.
After the call to testing number a voice connection is set up and active record data appears in SW phone.

### Actual Result:  OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

29/01/2013
### TEST case area

<table>
<thead>
<tr>
<th>Test case ID: 402</th>
<th>Functional test : PSAP – call taker application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name: Emergency call reception – part 1</td>
</tr>
</tbody>
</table>

#### Test Description:
Visualisation of simulated eCall in call taker application - SW phone.

#### Test steps:
Following test case 401 – usage of MSD simulator:
- checking of SW simulation setting (see test case 401), value of selected record, activation set up on value “YES”, visual and acoustic signalling
- checking of call taker status for eCall reception (active)
- dial test number 152

Usage of IVS simulator or IVS:
- Check /set up call taker status for eCall reception
- Activate eCall initiation on IVS

#### Expected Result:
Calling line identification is displayed in the SW phone of call taker application.
Call is indicated as eCall:
- Visually by special eCall icon and different colour in SW phone; list of basic eCall data (type, way of activation, trusted location) and other information in application log window
- Acoustically (special beep)

Active icons in the SW phone: “Receive call” and “Off Hook”
Inactive icons: “Dial”, “Redial” and “Reconnect”
In case of active Autoanswer, the call is automatically answered.

#### Actual Result:  OK / NOK / POK

#### Problem Severity:

#### Problem Description:

#### Problem Resolution:

#### Notes:

#### Date: 29/01/2013  Tester:
## TEST case area

<table>
<thead>
<tr>
<th>Functional test: PSAP – call taker application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> 403</td>
</tr>
<tr>
<td><strong>Name:</strong> Emergency call reception – part 2</td>
</tr>
</tbody>
</table>

### Test Description:

Reception of eCall.

### Test steps:

Following test case 402:

- click on icon “New event”
- check detail of answered call
- check new event creation in the list of “Received events”
- check the data from VIN decoder

### Expected Result:

Detail for “New event” is displayed.
Active icons: “Reconnect” and “Off Hook”.
Inactive icons: “Dial”, “Redial” and “Answer”.
In call detail sub-form are displayed:

- Call information
- MSD
- Vehicle information from VIN

Switching over between “Group by attribute name” and “Group by message” view is functional.
User is informed about data reception in the application protocol.

### Actual Result:

OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
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</table>

29/01/2013
## TEST case area

<table>
<thead>
<tr>
<th>Functional test: PSAP – call taker application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 404</td>
</tr>
<tr>
<td>Name: Emergency call reception – part 3</td>
</tr>
</tbody>
</table>

### Test Description:

Additional information to the eCall – call detail, what happened, remark

### Test steps:

Following test case 403:

- Fill in caller name to the item “Calling” (optional)
- Select communication level with vehicle occupants from the menu (optional)
- Fill in alternative telephone number for communication with vehicle occupants in the item “contact” (optional)
- Tick off “witness” item (optional)
- Fill in what happened (mandatory)
- Fill in remark field (optional)

### Expected Result:

- Item Caller is active and contains manually filled in name of caller.
- Item Contact is active and displays selected item.
- Item Callback is active and contains caller phone number.
- Item Witness is ticked off.
- Item What happened is active and contains manually filled in information.
- Item Remark is active and contains manually filled in information.

### Actual Result: OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

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<tr>
<th>Date:</th>
<th>Tester:</th>
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<tr>
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<tr>
<td>TEST case area</td>
<td>Functional test: PSAP – call taker application</td>
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<td>----------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Test case ID: 405</td>
<td>Name: Emergency call reception – part 4</td>
</tr>
</tbody>
</table>

**Test Description:**
Event position localisation.

**Test steps:**
Following test case 404:

- Check localisation in case of automatic identification takeover (PositionCanBeTrusted attribute active and inactive TestCall in MSD)
- Accomplish localization by taking over identification after the pushing button of "Takeover identification" in other cases
- Accomplish localisation manually by filling address via Topography from the menu state, region, district, town, part of town, street, house number based on information from vehicle occupants
- Accomplish localisation manually by filling location in Line topography by entering of road number and km based on information from vehicle occupants
- Accomplish localisation by usage of Topography helper based on information from vehicle occupants

**Expected Result:**
In case of manual/automatic takeover of location identification – localisation is found according to the location obtained from MSD. Event position localisation is correctly viewed in GIS map.

In other cases (manual searching in Topography) localisation is based on data chosen either from offered value in Topography or taken over from the offer of Topography Helper. Event position localisation is correctly viewed in GIS map.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** |

**Tester:**
TEST case area | Functional test: PSAP – call taker application
---|---
Test case ID: 406 | Name: Emergency call reception – part 5

**Test Description:**
Selection of rescue unit co-operation, regionalisation and event classification completion.

**Test steps:**
Following test case 405:
In case of automatic regionalization and classification check and/or correct (MSD value: real/testing call, automatic/manual, trusted position)
- check of rescue unit (Fire Rescue, Police, Ambulance)
- rescue unit regionalization according to event location
- event classification
In other cases manually:
- select rescue unit (Fire Rescue, Police, Ambulance)
- check/correct rescue unit regionalization according to event location
- enter event classification

**Expected Result:**
In case of automatic regionalization and classification – Fire Rescue, Police and Ambulance are primarily chosen; dispatching centres with regionalization according to event location and classification: traffic collision
In other cases rescue units are chosen, regionalisation is done automatically based on event location and respective classification.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** | **Tester:**
## TEST case area

<table>
<thead>
<tr>
<th>Functional test: PSAP – call taker application</th>
</tr>
</thead>
</table>

### Test case ID: 407

**Name:** Emergency call reception – part 6

### Test Description:

Event saving, call off hook and event closure.

### Test steps:

Following test case 406:

- check mandatory field “What happened”
- check rescue unit and its regionalisation
- close Event by clicking on Saving (all changes done) icon in the panel of main substitutes
- push the Off hook button in the SW phone if the call has not been already terminated
- check Call taker status in SW phone and in the Call taker list
- click on Closure current form icon in the main panel

### Expected Result:

New data entry is finished and data are stored in database.

Call taker status is “Talks” if the call is not terminated or reconnected

Call taker status is “Occupied” in case that event is not closed and the call is terminated / reconnected.

After event detail is closed it disappears from the screen. If the event is not closed by icon, it disappears automatically after 60 s.

### Actual Result:

OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
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<tr>
<th>Date:</th>
<th>Tester:</th>
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<tr>
<td></td>
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</tbody>
</table>
## Test case area

<table>
<thead>
<tr>
<th>Test case ID: 408</th>
<th>Functional test: PSAP – call taker application</th>
</tr>
</thead>
</table>

**Test Description:**

Call binding with one event.

**Test steps:**

Following test case 407:

- Receive other eCall
- Check eCall view in GIS including direction
- Via “Last call” fold bind received eCall with already created event
- Receive emergency call from mobile phone
- Check mobile phone view in GIS
- Via “Last call” fold bind received emergency call with already created event

Continue Test case ID 407

**Expected Result:**

eCall is correctly received in SW phone
eCall is correctly viewed including direction
eCall is correctly bound with actual event
emergency call is correctly received in SW phone
Mobile phone is correctly viewed in GIS
Emergency call is correctly bound with actual event

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Integration test : IVS - PSAP modem - call taker application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 501</td>
<td>Name: MSD update – part 1</td>
</tr>
</tbody>
</table>

**Test Description:**

MSD request during the voice call with vehicle occupants.

**Test steps:**

Receive eCall (test case ID 402, 403, 404)

- check recommendation in the text field above “Send MSD button” (Edit box)
- inform vehicle occupants about short interruption of the voice communication
- push the button „Request MSD“
- check the process and the result of the operation in Edit box
- check new MSD received in Event detail
- check new VIN decoding

Continue test case ID 507, 405 – 407 or terminate the call.

**Expected Result:**

Display of icon in the Request MSD button and text description of proceeding action in the text field above the button (Edit box)

Voice communication with the caller is interrupted.

Result is displayed in the text field above „Request MSD“ button (edit box) and icon informing that operation was closed is displayed.

Voice communication with the caller is restored.

New MSD appears in Event detail including new VIN decoding and result information is displayed in the application protocol.

Positions from MSD are viewed in GIS.

**Actual Result:**  OK / NOK / POK

Problem Severity:

Problem Description:

Problem Resolution:

Notes:

Date:  
Tester:
## TEST case area

<table>
<thead>
<tr>
<th>Integration test : IVS - PSAP modem - call taker application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 502</td>
</tr>
<tr>
<td>Name: MSD update – part 2</td>
</tr>
</tbody>
</table>

### Test Description:

MSD request during callback.

### Test steps:

- Receive eCall (test case ID 402, 403, 404)
  - do Off hook of ecall
  - choose Call back in the context menu above call detail
  - check the voice communication with vehicle occupants
  - after the voice call is established warn vehicle occupants about short voice connection interruption and its reason
  - push the button Request MSD
  - check the result of the operation
  - check the voice communication restoration
  - check new MSD received
  - check new VIN decoding
  - change view in phone detail via button “Group by messages”
  - switch over among obtained MSD

Terminate the call and close event detail.

### Expected Result:

- IVS number is displayed in SW phone after the Callback menu selection.
- New voice call is established and automatically is bind with the Event – new item in the list of bound calls.
- After the Request MSD button is pushed - display of icon in the Request MSD button and text description of proceeding action in the text field above the button.
- After the voice communication restoration result is displayed in the text field above „Request MSD“ button and icon informing that operation was closed is displayed.
- New MSD including new VIN decoding appears in call detail and result information is displayed in the application protocol.
- Respective positions are viewed in GIS.

### Actual Result:  OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:
<table>
<thead>
<tr>
<th>Notes:</th>
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<tbody>
<tr>
<td>Date:</td>
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</table>

29/01/2013
## TEST case area

<table>
<thead>
<tr>
<th>Test case ID: 503</th>
<th>Name: VIN decoding</th>
</tr>
</thead>
</table>

### Test Description:

Sending query to the VIN decoder and reception of decoded content.

### Test steps:

Tests run for simulated calls which contain predefined VIN codes. Tests are done via SW simulator – entered records with VIN data are step by step activated.

- enter selected VIN data to the SW simulator
- activate SW simulator
- check response time and correctness of decoded VIN in call detail
- interrupt VIN decoder connection (stop web service)

Continue test case 407.

### Expected Result:

VIN value and decoded content corresponds with settings.
VIN and decoded content is properly visualised in the “Call detail” sub-form.
Error visualisation in application log corresponds with settings and test data quality.
After the VIN decoder service interruption Call taker application behaves properly.

### Actual Result:  OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
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</thead>
</table>
## TEST case area

<table>
<thead>
<tr>
<th>Integration test : Call taker application – ECC interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 504</td>
</tr>
<tr>
<td>Name: ECC interface</td>
</tr>
</tbody>
</table>

### Test Description:

Dispatch data to the Emergence Control Centre systems. Creation of simulated ECCs.

### Test steps:

**Preparation task - in the testing application server:**

- start ComTrafo services configured for communication with respective rescue units
- start TCTV Responder application configured respectively for required rescue units
- verify availability of simulated dispatching centres in Call taker application – available dispatch centres are marked by green icon

**Receive eCall (test case ID 402 - 406)**

- select respective emergence control centre of rescue units
- save and send Event
- check the delivery and Event processing in the ECC
- display the content of sent data by the help of choice List of Data records

Terminate the call and close event detail.

### Expected Result:

Required rescue units are selected and their accessibility is indicated by green icon.

Status of the Event solution is signalized in the list and event detail by the icon and text description.

Displayed Data record includes eCall element containing MSD and VIN data.

### Actual Result: OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test case ID: 505</strong></td>
<td><strong>Name:</strong> TMS data dispatch to the Traffic Management Centre</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Test Description:</strong></td>
<td>Dispatching data about solved event with traffic collision classification to the Traffic Management Centre.</td>
</tr>
</tbody>
</table>
| **Test steps:** | Receive eCall (test case ID 402, 403, 404, 405)  
- Tick off choice „Inform TMC“   
- Check the data delivery to TMC.  
Continue test case ID 407. |
| **Expected Result:** | Selection is ticked off.  
Event data reception on TMC confirmed. |
| **Actual Result:** | OK / NOK / POK |
| **Problem Severity:** | |
| **Problem Description:** | |
| **Problem Resolution:** | |
| **Notes:** | |
| **Date:** | **Tester:** |
4 Literature

1. The referenced ETSI specifications may be downloaded from:

2. The referenced 3GPP specifications may be downloaded from:
ftp://ftp.3gpp.org/Specs/archive/

3. The referenced CEN specifications (Published versions) may be purchased from national standards organisations, including BSI and NEN.

4. Copies of CEN draft specifications are normally only made available to CEN Working Group members.
5 Annex A: Member states related sets of tests

5.1 Romania

5.1.1 Testing Environment Overview

These chapter describes the special Romanian testing requirements that differ from the other Member states.

![Test platform for the eCall Modem and MSD Decoder](image)

Figure 1: Test platform for the eCall Modem and MSD Decoder

5.1.2 Test Cases

<table>
<thead>
<tr>
<th>Test No.: 1</th>
<th>Test name: Receiving MSD_inject messages from PSAP modem</th>
</tr>
</thead>
</table>

**General description:** The test aims to verify the ability of MSD decoder to receive the MSD inject messages from PSAP modem and to respond adequately. More specific the test will verify if MSD decoder accepts:

- MSD_inject: this message is sent by PSAP modem to MSD decoder. It’s used for cases when PSAP modem successfully retrieved a MSD from IVS.

Also the test will verify if MSD decoder sends as response the acknowledgment
message:
- MSD_inject_ACK

Initial conditions (enter conditions): PSAP modem and MSD decoder are able to communicate (e.g. via TCP protocol). There is an IVS connected or other tool able to generate MSD messages and to communicate with PSAP modem.

Test data: valid and invalid MSD_inject messages

Test flow:
1. PSAP modem sends MSD inject messages to MSD decoder that conforms to specifications
2. PSAP modem sends MSD inject messages to MSD decoder that does not conform to specifications

Expected result:
1. MSD decoder responds with MSD_inject_ACK containing no errors
2. MSD decoder responds with MSD_inject_ACK containing errors (invalid message)

For all cases MSD decoder save the messages in the database and data regarding transmission into log files

Actual result: Complies

Note: MSD decoder acts as expected

Date: 07.11.2011
Signature:

Test No.: 2 | Test name: Decoding MSD messages

General description: The test aims to verify the ability of MSD decoder to decode MSD messages – read the binary format and transform the message in XML format as specified in standard EN 15722.

Initial conditions (enter conditions): There is a tool or PSAP modem able to send MSD_inject messages that contains valid and invalid MSDs

Test data:
Valid MSD Inject with **valid** MSD:

```
INJECT eCall/1.0
TimeStamp:2011.11.03/15:19:39
CallID:2c918489
IVSNumber:555,noa_subscr
ModemID:Bucuresti
ModemIP:10.21.4.101
MSDContent:
015C0681D54970D65C3597CA0420C41464583ADE68AC52E9BB8413F149C07414FB414
F601018013E82181823230000000000000000000000000000000000000000000000

Valid MSD inject with **invalid** MSD

```

```
INJECT eCall/1.0
TimeStamp:2011.11.03/15:28:16
CallID:03916e0e
IVSNumber:555,noa_subscr
ModemID:Bucuresti
ModemIP:10.21.4.101
MSDContent:
A0CBB22C0CC3304DD3348EE338CFF300BA57A04C80E3450BA029D90200000000000

```

**Test flow:**

1. A valid MSD inject with valid MSD message is sent to MSD decoder
2. A valid MSD inject with invalid MSD message is sent to MSD decoder

**Expected result:**

1. MSD decoder responds with MSD_ inject_ ACK containing no errors, for test data it should be something like:

```
eCall/1.0 200 MSD Inject OK
TimeStamp:2011.11.03/15:24:40
CallID:2c918489
ModemID:Bucuresti
ModemIP:10.21.4.101
Also MSD decoder saves the decoded MSD into database. For test data it has to be:
```

```
<?xml version="1.0" ?>
<MsdcDecoded xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<Msdid>1</Msdid>
<Callid>2c918489</Callid>
<Modemid>Bucuresti</Modemid>
```
2. MSD decoder responds with MSD_inject_ACK containing errors (invalid message). For test data it has to be like:

eCall/1.0 400 MSD Inject Error
For all cases MSD decoder save the messages in the database and data regarding transmission into log files

**Actual result:** Complies

**Note:** MSD decoder acts as expected

<table>
<thead>
<tr>
<th>Test No.: 3</th>
<th>Test name: Receiving MSD_unretrievable messages from PSAP modem</th>
</tr>
</thead>
</table>

**General description:** The test aims to verify the ability of MSD decoder to receive the MSD_unretrievable messages from PSAP modem and to respond adequately. More specific the test will verify if MSD decoder accepts:

- MSD_unretrievable: this message is sent by PSAP modem to MSD decoder. It’s used for cases when PSAP modem didn’t succeed in retrieving a MSD from IVS.

Also the test will verify if MSD decoder sends as response the acknowledgment message:

- MSD_unretrievable_ACK

**Initial conditions (enter conditions):** PSAP modem and MSD decoder are able to communicate via TCP protocol. There is an IVS connected or other tool able to generate MSD messages and to communicate with PSAP modem.

**Test data:** valid and invalid MSD_unretrievable messages

**Test flow:**

1. PSAP modem sends MSD unretrievable messages to MSD decoder that conforms to specifications
2. PSAP modem sends MSD unretrievable to MSD decoder that does not conform to specifications
### Expected result:

1. MSD decoder responds with MSD_unretrievable_ACK containing no errors
2. MSD decoder responds with MSD_unretrievable_ACK containing errors (invalid message)

For all cases MSD decoder save the messages in the database and data regarding transmission into log files

### Actual result: Complies

### Note: MSD decoder acts as expected

### Date: 07.11.2011

---

<table>
<thead>
<tr>
<th>Test No.: 4</th>
<th>Test name: Measuring decoding performance of MSD decoder</th>
</tr>
</thead>
</table>

### General description:
The test aims to measure the decoding time for a situation when one MSD inject with valid MSD message is sent to MSD decoder within 5 seconds. So there is one/5 seconds.

### Initial conditions (enter conditions):
PSAP modem or other tool is able to generate and send one valid MSD inject with valid MSD inside with a frequency of 5 seconds.

### Test data: valid MSD_inject messages

### Test flow:

1. PSAP modem or other tool sends one valid MSD inject with valid MSD inside with a frequency of 5 seconds for 5 minutes (60 messages).

### Expected result:

1. MSD decoder responds with MSD_inject_ACK containing no errors for each message. MSD decoder successfully decodes all messages. Each message is decoded in less than 1 second

For all cases MSD decoder save the messages in the database and data regarding transmission into log files
### Actual result: Complies

**Note:** MSD decoder acts as expected. The average decoding time was far less than 1 second (about 0.015 seconds) after sending 5 messages – so the test was stopped. None of the message exceeded 0.025 seconds for decoding. The hardware used for tests was a regular PC, in fact a laptop (Processor 2.5 GHz, Intel core2, RAM 3 GB, HDD 5400 RPM)

<table>
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<tr>
<th>Date: 07.11.2011</th>
<th>Signature:</th>
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<tr>
<th><strong>Test No.: 5</strong></th>
<th><strong>Test name:</strong> Measuring the number of “parallel” decoding without performance degradation</th>
</tr>
</thead>
</table>

**General description:** The test aims to measure the decoding time for a situation when many MSD inject with valid MSD messages are sent to MSD decoder equally distributed within 5 seconds. So there is one/5 seconds, 2/5 seconds… 30/5 seconds.

The test tries to find the number of parallel decoded messages with a performance degradation less than 20% comparing with 1 message /5 seconds

**Initial conditions (enter conditions):** PSAP modem or other tool is able to generate and send many valid MSD inject with valid MSD inside with a frequency of 5 seconds (equally distributed – meaning that 5 messages /5 seconds is, in fact 1/second).

**Test data:** valid MSD_inject messages

**Test flow:**

1. PSAP modem or other tool ends MSD sends one valid MSD inject with valid MSD inside with a frequency of 5 seconds for 5 minutes (60 messages).

2. PSAP modem increase the number of messages sent within 5 seconds to 2, 5, 10, 20, 30, 100 etc until the average decoding time is 20% greater than the one for 1 message /5 seconds

**Expected result:**

1. MSD decoder responds with MSD_inject_ACK containing no errors for each message. MSD decoder successfully decodes all messages. At least 30 messages are decoded “in parallel” when received with a frequency of 1/0.033 seconds.
For all cases MSD decoder save the messages in the database and data regarding transmission into log files

**Actual result:** Complies

**Note:** MSD decoder acts as expected. When reached 5 messages/5 seconds the performance increased in fact – the test was stopped because is obvious that degradation for 30 messages won’t be significant – about 2%. The hardware used for tests was a regular PC, in fact a laptop (Processor 2,5 GHz, Intel core2, RAM 3 GB, HDD 5400 RPM).

**Date:** 07.11.2011

---

**Test No.: 6**

**Test name:** Sending MSD_decoded messages to MSD processing layer

**General description:** The test aims to verify the ability of MSD decoder to send the MSD decoded messages to MSD processing layer.

**Initial conditions (enter conditions):** MSD decoder and MSD processing layer are able to communicate (e.g. via HTTP protocol).

**Test data:** valid MSD_decoded messages

**Test flow:**

1. MSD decoder sends MSD_decoded messages to MSD processing layer

**Expected result:**

1. MSD processing layer responds with MSD_decoded_ACK containing no errors.

   In case there is no answer MSD decoder tries again after a specific period of time (depends on configuration parameters)

For all cases MSD decoder save the messages in the database and data regarding transmission into log files

**Actual result:**
### Test No.: 7

**Test name:** Querying EUCARIS after receiving a MSD_inject message

**General description:** The test aims to verify the ability of MSD decoder to query EUCARIS platform after receiving a valid MSD_inject with a valid MSD inside by using the VIN information.

**Initial conditions (enter conditions):** PSAP modem and MSD decoder are able to communicate via TCP protocol. There is an IVS connected or other tool able to generate MSD messages and to communicate with PSAP modem.

There is access to EUCARIS test environment: VIN processing module is able to access the web services exposed by EUCARIS

VIN processing module is able to communicate via HTTP with MSD processing layer

**Test data:** valid MSD messages with valid VINs (VINs are registered in EUCARIS test environment)

**Test flow:**

1. PSAP modem sends valid MSD_inject with valid MSD inside to MSD_decoder

**Expected result:**

1. MSD decoder decodes the MSD and call VIN processing module using the VIN as parameter
2. VIN processing module query EUCARIS and obtains EUCARIS data
3. VIN processing module save the data into database
4. VIN processing module prepares EUCARIS_Response and sends it to MSD processing layer

2. MSD processing layer responds with Eucaris_response_ACK containing no errors.

   In case there is no answer VIN processing module tries again after a specific period of time (depends on configuration parameters)
<table>
<thead>
<tr>
<th>Test No.: 8</th>
<th>Test name: Querying EUCARIS after receiving a EUCARIS_Request message</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General description:</strong></td>
<td>The test aims to verify the ability of MSD processing module to query EUCARIS platform after receiving a valid Eucaris_request from MSD processing layer</td>
</tr>
<tr>
<td><strong>Initial conditions (enter conditions):</strong></td>
<td>VIN processing module is able to communicate via HTTP with MSD processing layer. There is access to EUCARIS test environment: VIN processing module is able to access the web services exposed by EUCARIS</td>
</tr>
<tr>
<td><strong>Test data:</strong></td>
<td>valid EUCARIS_request messages with valid VINs or plate numbers (VINs and plate numbers are registered in EUCARIS test environment)</td>
</tr>
<tr>
<td><strong>Test flow:</strong></td>
<td>1. MSD processing layer sends valid Eucaris_request to VIN processing module</td>
</tr>
</tbody>
</table>
| **Expected result:** | 1. VIN processing module responds with EUCARIS_request_ACK  
2. VIN processing module query EUCARIS and obtains EUCARIS data  
3. VIN processing module save the data into database  
4. VIN processing module prepares EUCARIS_Response and sends it to MSD processing layer  
5. MSD processing layer responds with Eucaris_response_ACK containing no errors. In case there is no answer VIN processing module tries again after a specific
period of time (depends on configuration parameters).

| Actual result: |
| Note: |
| Date: | Signature: |

5.2 Germany

5.2.1 Testing Environment Overview

Germany starts testing with two PSAPs in Braunschweig and Oldenburg and 10 IVS systems. In the first part of the test no MNO is involved, so the tests will use long numbers to call the PSAP.

All eCall enabled cars belong to the Flughafentransfer Hannover, a company that operates a shuttle service from or to the Hanover Airport. The cars are usually driving around Hanover and a region that covers about 200 by 200 km. eCall systems are connected to the CAN BUS, but currently are not connected to safety critical systems like the Airbag. eCalls are processed automatically by timer, but can also be processed manually by pressing a button. This allows about 10 eCalls per hour to be received without disturbing the standard shuttle service.

On the PSAP side, the test starts with Braunschweig due to PSAP Oldenburg currently under construction. This means all IVS calls using the same long number during the first test phase. The PSAP in Braunschweig is equipped with an additional work place only for eCalls. Usually this eCall work place answers incoming eCalls automatically. During the special field test days an operator will answer the calls manually. The Braunschweig PSAP work place consists of a ISDN line PBX with an ISDN telephone, an eCall Inband Modem Server and a PSAP GUI to receive eCalls. It is currently limited to eCalls only.

In Oldenburg, the eCall service will be integrated to all work places. However, to avoid interference with real emergency calls, only one work place at a time will receive incoming eCalls. Oldenburg consists of a multiline ISDN PBX, an eCall Inband-Modem server a PSAP GUI extension to the existing PSAP application.
5.2.2 Test Cases

These test cases describe the special German testing requirements that differ from the other Member states. However, all standard test cases (as currently described in Chapter 3) will be processed before these test cases are performed.

In Germany, a special PSAP upgrade scenario will be tested called the “eCall switch”. This scenario is shown in the figure below and requires some modified test cases.

![Figure 2: German Upgrade Scenario: eCall switch Box](image)

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : eCall Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID:  D001</td>
<td>Name: eCall Center activation</td>
</tr>
<tr>
<td>Test Description: The eCall Center is activated, launch self-test and indicates status</td>
<td></td>
</tr>
</tbody>
</table>

**Test steps:**

- eCall Center is powered down (if necessary)
- eCall Center is launched for initial testing during activation
- eCall Center indicates activation status
- eCall Center indicates limited functionality in case an error occurred during initial testing
- eCall Center is available through configured port (and Username/Password combination) over the Internet – this can be verified by using the German Test Center client from a public Internet connection

**Expected Result:** activation – initial testing – status indication – status check from client software
### Test Case Area

**Unit Test**: PSAP

#### Test Case ID: D002  Name: eCall switch enabling

**Test Description**: The PSAP eCall switch is activated, launch self-test and indicates status

**Test Steps**:
- eCall switch is powered down (if necessary)
- eCall switch is launched for initial testing during activation
- eCall switch indicates activation status. This includes hardware status and connection status to the eCall Center.
- eCall switch indicates limited functionality in case an error occurred during initial testing

**Expected Result**: activation – initial testing – status indication

**Actual Result**: OK / NOK / POK

**Problem Severity**:

**Problem Description**:

**Problem Resolution**:

**Notes**:

**Date**:  

**Tester**:  

---

#### Test Case Area

**Unit Test**: PSAP

#### Test Case ID: D003  Name: work place connecting to eCall Switch Box

**Test Description**: The operator’s telephone is connected to the eCall switch and receives
voice calls

Test steps:
- call PSAP long number via mobile phone to establish a voice connection
- operator’s telephone rings
- operator receives voice call
- operator hangs up - call is finished
- alternative: mobile phone hangs up – call is finished

Expected Result: calling – receiving voice call – hanging up

Actual Result: OK / NOK / POK

Problem Severity:

Problem Description:

Problem Resolution:

Notes:

Date: 

Tester:

---

TEST case area

<table>
<thead>
<tr>
<th>Unit test : PSAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: D004</td>
</tr>
</tbody>
</table>

Test Description: Incoming IVS call is separated into MSD and voice call

Hint: This test overrides the standard IVS / PSAP eCall transmission. If an eCall switch is installed, the MSD is always sent to an eCall Center, while the voice call stays at the PSAP.

Test steps:
- IVS calls PSAP
- PSAP receives and accepts call
- MSD is separated and sent to the eCall Center (binary and undecoded)
- eCall Center receives MSD. Check is done by a byte-to-byte comparison.
- operator receives voice call
- operator hangs up - call is finished

Expected Result: IVS calling – receiving eCall – hanging up. eCall is received correctly at the eCall Center (binary and undecoded).

Actual Result: OK / NOK / POK

Problem Severity:
Problem Description:

Problem Resolution:

Notes:

Date:  
Tester:

TEST case area  Unit test : eCall Center

Test case ID: D005  Name: MSD processing and decoding

Test Description: Incoming binary MSD call is decoded and processed

Hint: This test overrides the standard IVS / PSAP eCall transmission. If an eCall switch is installed, the MSD is always sent to an eCall Center, while the voice call stays at the PSAP.

Test steps:

- Test D004
- After eCall Center receives MSD, the MSD is decoded and stored in the local database.

Expected Result: IVS calling – receiving eCall – hanging up. MSD is decoded correctly at the eCall Center. MSD data is stored at the eCall Center database.

Actual Result: OK / NOK / POK

Problem Severity:

Problem Description:

Problem Resolution:

Notes:

Date:  
Tester:

TEST case area  Unit test : PSAP

Test case ID: D006  Name: PSAP MSD reception

Test Description: The operator at the PSAP receives the decoded MSD from the eCall Center.
**Hint:** This test overrides the standard IVS / PSAP eCall transmission. If an eCall switch is installed, the MSD is always sent to an eCall Center, while the voice call stays at the PSAP.

**Test steps:**
- Test D004
- After eCall Center has decoded the MSD, the PSAP receives a Push information with the decoded MSD data.
- MSD is displayed correctly at the operator’s screen

**Expected Result:** IVS calling – receiving eCall – hanging up. MSD is displayed correctly at the PSAP. Transmission should be finished instantly after sending the MSD to the eCall Center.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

---

**5.3 Finland**

**5.3.1 eCall testing**

ECall testing during the pilot will be accomplished as illustrated in the following figure:
In addition to the eCall client simulator (described in Section 4.1) several other eCall clients may be used during the pilot. They may include both eCall client simulators and/or in-vehicle clients (if available).

The clients used should include functionality for generating and sending standard eCall MSD (Minimum Set of Data) messages via the standardized in-band modem solution to the test number configured to the PSAP simulator (eCall testbed).

During the tests, the Web user interface for managing the operation of the testbed (Section 4.3) will be used. It will provide configurations for the test users, possibility to register the eCall clients (e.g. client phone numbers) used in the tests. Also, the pilot system operation can be managed via the user interface. It will also provide views to result logs.

The log facility of the testbed will provide information about received messages (e.g. call time, modem session, duration, MSD information, warnings) and error cases. In particular, it will be used to validate the operation of the system as well as eCall clients.

The eCall pilot system can be directly used in cross borders activities that are planned to take place with one or two consortium partners.

In practice, tests may be accomplished so that Finnish eCall Testbed is used as an eCall receiver (PSAP) and/or the eCall client simulator (part of Finnish eCall pilot) used as a eCall sender (in vehicle).
Figure 4: Cross borders tests using the Finnish pilot system eCall sender and receiver parts.

5.3.2 Test cases

The Finland fully follows the standard set of tests, which are listed in chapter 3.

5.4 Czech Republic

5.4.1 Testing Environment Overview

Figure 5: Testing environment of Czech Republic
PSAP call centre part consist of PBX, IVR equipped with PSAP modem and PSAP application and Server Genesys.

PSAP Call Taker SW part consist of SW phone, Event Detail module with new function of MSD and VIN data visualisation, Topography Helper, GIS, VIN decoder interface (new SW module), ECC interface and TMS interface (new SW module).

5.4.2 Test cases

The Czech Republic follows the standard set of tests, beside these it will be provided following:

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : IVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 1001</td>
<td>Name: Test of GPRS functionality</td>
</tr>
<tr>
<td>Test Description: The IVS sends and receives data over GPRS</td>
<td></td>
</tr>
<tr>
<td>Test steps:</td>
<td></td>
</tr>
<tr>
<td>- OBU has correct GPRS set up</td>
<td></td>
</tr>
<tr>
<td>- OBU can send claimed data over GPRS</td>
<td></td>
</tr>
<tr>
<td>- OBU can receive and process commands over GPRS</td>
<td></td>
</tr>
<tr>
<td>Expected Result: All data are delivered and confirmed</td>
<td></td>
</tr>
<tr>
<td>Actual Result: OK / NOK / POK</td>
<td></td>
</tr>
<tr>
<td>Problem Severity:</td>
<td></td>
</tr>
<tr>
<td>Problem Description:</td>
<td></td>
</tr>
<tr>
<td>Problem Resolution:</td>
<td></td>
</tr>
<tr>
<td>Notes:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td>Tester:</td>
</tr>
</tbody>
</table>
## Test Description

OBU is measured for power consumption and ability to operate for a defined period of time when vehicle power is cut off.

### Test Steps

- OBU power consumption in active mode is within the defined interval
- OBU power consumption in passive mode is within the defined interval
- OBU cut off the vehicle power has enough backup power to operate for the defined period of time
- OBU is able to indicate insufficient power for operation

### Expected Result

OBU cut-off the vehicle power is operable for the defined period of time

### Actual Result

OK / NOK / POK

### Problem Severity

- [ ] High
- [ ] Medium
- [ ] Low

### Problem Description


### Problem Resolution


### Notes


### Date

29/01/2013

### Tester


### TEST case area: Unit test : IVS

<table>
<thead>
<tr>
<th>Test case ID:</th>
<th>1003</th>
<th>Name: Vehicle communication bus connection test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Description:</td>
<td>OBU can read the data from vehicle communication bus</td>
<td></td>
</tr>
</tbody>
</table>

**Test steps:**
- OBU is able to read the defined data from CAN bus
- OBU is able to read the defined data from FMS bus

**Expected Result:** All requested data are delivered and confirmed

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

---

### TEST case area: Unit test : IVS

<table>
<thead>
<tr>
<th>Test case ID:</th>
<th>1004</th>
<th>Name: OBU configuration test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Description:</td>
<td>OBU receives a new configuration data, then reset itself and load default configuration</td>
<td></td>
</tr>
</tbody>
</table>

**Test steps:**
- OBU is able to re-load the actual configuration
- OBU is able to reset itself
- OBU is able to load the default configuration

**Expected Result:** OBU finishes with default configuration

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

---
Problem Resolution:

Notes:

<table>
<thead>
<tr>
<th>Date</th>
<th>Tester</th>
</tr>
</thead>
</table>

**TEST case area** | **Unit test : PSAP modem**

Test case ID: 1005  Name: Test call

**Test Description:**

IVS calls the PSAP with a test message in the MSD.

**Test steps:**

- PSAP is in communication with the IVS
- PSAP modem collects the MSD
- PSAP modem sends LL-ACK to the IVS with the positive status
- PSAP modem checks the validity of the MSD data
- PSAP modem sends HL-ACK to the IVS with the positive status
- PSAP modem transfers the call to the CCIVR application

**Expected Result:**

PSAP CCIVR connector has received the MSD results.
CCIVR application will receive the call to attach data and 'TEST_ECALL_SCENARIO'.

**Actual Result:**  OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

Notes:

<table>
<thead>
<tr>
<th>Date</th>
<th>Tester</th>
</tr>
</thead>
</table>

29/01/2013  100  Version 1.1
5.5 Italy

5.5.1 Testing Environment Overview

HeERO Italian pilot project will test IVS from three vendors installed in three FIAT car provided by CRF and IVS from MM installed in 10 or more cars of volunteer ACI members involved in the pilot. Transmitting eCall through Telecom Italia Mobile (TIM), modified to accept the eCall Flag functionality, and through Telecom Italia fixed network that will deliver the eCall to a real EU 112 first level PSAP in Varese. Varese’s PSAP is the first installation in Italy of the 112 unified number services and is run by AREU. The area covered by this operation room serves more than 1.100.000 citizens and the testbed will be a portion of this area that will include urban and suburban environments. The Varese PSAP is structured with a 1st level infrastructure and a 2nd level, including police, emergency units, firefighters and Carabinieri. The architecture will be modified to be able to include the new data from the MSD both in the classification of the event in 1st level PSAP and into the dispatch to 2nd level.

Italy starts testing with a preliminary PSAP version installed in the TLab laboratory and three IVS (2 provided by CRF and 1 provided by Marelli). In the first part of the test the eCall discriminator is not yet managed, so the tests will use long numbers to call the PSAP.

5.5.2 Test Cases

The Italian Pilot will process the standard test cases listed in the following. The Italian test site will focus on the eCall chain management.

The tests related to devices (GPS, GPRS, and OTA) are out of scope of Italian test site.
Considering the architecture indicated in D2.3 for the Italian pilot project, where MEB indicates the MSD Extractor Box and where the voice call will be established as soon as the operator answers the phone (MSD demodulation occurs in parallel), the Italian test activity is divided into three main phases.

### 5.5.2.1 Internal tests

Every single main part of the infrastructure: IVS, MSD Extractor Box (MEB) with PBX and the PSAP software part, which includes MSD management and presentation of information, is tested for its own specific functionalities.

**IVS internal test** cases include the following tests from standard set of tests:

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>003</td>
<td>Test of GPRS functionality</td>
</tr>
<tr>
<td>004</td>
<td>Test of power consumption (Note: function tested only with MM OBU)</td>
</tr>
<tr>
<td>007</td>
<td>GSM module test</td>
</tr>
<tr>
<td>012</td>
<td>eCall triggering test</td>
</tr>
<tr>
<td>013</td>
<td>eCall triggering test II</td>
</tr>
<tr>
<td>015</td>
<td>Test of operating requirements for error handling</td>
</tr>
<tr>
<td>016</td>
<td>eCall termination test</td>
</tr>
</tbody>
</table>
### TEST case area

| Test case ID: 004 | Name: Test of power consumption |

**Test Description:** OBU is measured for power consumption and ability to operate for defined period of time when vehicle power is cut off

**Test steps:**
- OBU power consumption in active mode is within the defined interval
- OBU power consumption in passive mode is within the defined interval
- OBU cut off the vehicle power has enough backup power to operate for the defined period of time

**Expected Result:** OBU cut-off the vehicle power is operable for the defined period of time

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:** function tested only with MM OBU

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>TEST case area</td>
<td>Unit test : IVS</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Test case ID: 007</td>
<td>Name: GSM module test</td>
</tr>
<tr>
<td><strong>Test Description:</strong> OBU attempts to establish an emergency call over GSM</td>
<td></td>
</tr>
<tr>
<td><strong>Test steps:</strong></td>
<td></td>
</tr>
<tr>
<td>• OBU is able to connect to home GSM network</td>
<td></td>
</tr>
<tr>
<td>• OBU is able to send emergency setup message</td>
<td></td>
</tr>
<tr>
<td>• OBU is able to send the correct eCall flag in setup message</td>
<td></td>
</tr>
<tr>
<td>• OBU is able to indicate unavailability of the home network</td>
<td></td>
</tr>
<tr>
<td><strong>Expected Result:</strong> OBU is able to ask for an emergency call establishment</td>
<td></td>
</tr>
<tr>
<td><strong>Actual Result:</strong> OK / NOK / POK</td>
<td></td>
</tr>
<tr>
<td><strong>Problem Severity:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Problem Description:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Problem Resolution:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td></td>
</tr>
<tr>
<td>The indication of the missing home network will be stored in log file coming from the IVS</td>
<td></td>
</tr>
<tr>
<td><strong>Date:</strong></td>
<td><strong>Tester:</strong></td>
</tr>
<tr>
<td>TEST case area</td>
<td>Functional test : IVS - PSAP</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Test case ID:</td>
<td>Name: Test for incoming PSAP call-back request</td>
</tr>
<tr>
<td>010</td>
<td></td>
</tr>
</tbody>
</table>

**Test Description:** OBU is called by PSAP and it answers the call

**Test steps:**

OBU is able to connect microphone and headset in case of callback

- OBU is able automatically pick up the incoming call from PSAP

**Expected Result:** OBU answers the PSAP call-back and driver and PSAP operator are able to speak each other

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:** Ok for the callback, but callback is accepted only if it arrives from the same number called for eCall (112) or bCall

**Date:**

**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Functional test : IVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 012</td>
<td>Name: eCall triggering test</td>
</tr>
<tr>
<td>Test Description: eCall is manually and automatically initiated</td>
<td></td>
</tr>
</tbody>
</table>

**Test steps:**
- The pressed panic button for the defined period of time causes the manual eCall triggering
- eCall triggering is indicated to driver

**Expected Result:** eCall is only launched upon the request of the defined criteria

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
### TEST case area

<table>
<thead>
<tr>
<th>Test case ID: 013</th>
<th>Name: eCall triggering test II</th>
</tr>
</thead>
</table>

**Test Description:** eCall is triggered manually and automatically

#### Test steps:
- Manual triggering of eCall will be activated pushing button
- eCall triggering is indicated to driver

**Expected Result:** eCall is activated by pushing button

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:** manual activation and/or automatic activation in according to the board used for the test

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

29/01/2013 107  Version 1.1
### TEST case area

<table>
<thead>
<tr>
<th>Functional test : IVS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> 015</td>
</tr>
</tbody>
</table>

**Test Description:** eCall is ringing, then established, then interrupted, then established again within 120 second, but MSD not received

**Test steps:**
- In case the call is established and “ringing”, the OBU shall maintain the connection for at least 30 seconds to allow the PSAP to answer

**Expected Result:** All the timing is observed and in case of data transmission error, the E112 call is established

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

29/01/2013 108 Version 1.1
### Test Description
During established eCall a clear-down and/or proper signalization is received.

### Test steps:
- OBU is able to terminate a call as soon as the appropriate signalization from GSM network is received.

### Expected Result
eCall is correctly finished.

### Actual Result
OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
<thead>
<tr>
<th>Date</th>
<th>Tester</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Functional test : IVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: 016</td>
<td>Name: eCall termination test</td>
</tr>
</tbody>
</table>

---

**D2.4 System test cases and verification report**

---

**29/01/2013 109 Version 1.1**
**MEB internal testing** includes the following tests:

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Internal test : MEB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: MEB01</td>
<td>Name: MEB get the call &amp; extract correct MSD</td>
</tr>
</tbody>
</table>

**Test Description:** A call is generated towards the MEB that get it and decode a correct MSD

**Test steps:**
- A call is generated by a simulated IVS
- MEB gets the call
- The MEB collects the MSD
- The MEB sends LL-ACK to the simulated IVS with the positive status
- The MEB checks the validity of the MSD data
- The MEB sends HL-ACK to the simulated IVS with the positive status
- The MEB returns the MSD to the application

**Expected Result:**

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

---

**MSD managing software,** besides being tested with standard procedures as depicted in previous paragraphs, such as Annex A, is tested as follows:

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Internal test : MSD manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: SW01</td>
<td>Name: Information decoding and storing</td>
</tr>
</tbody>
</table>

**Test description:** MSD data decryption out of the PER format and storage into the local database.

**Test steps:**
- MSD arrives from the MEB with a correct CRC;
- MSD manager decrypts the string and extracts data;
- Data is inserted in the database, including eCall parameters and VIN;
- Data is displayed on the operator screen, in the event form.

**Expected Result:**

Decryption operation is correct;
Database is filled correctly with eCall data;
The operator can see details related to the eCall.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

Date: 
Tester:
### TEST case area

**Internal test : MSD manager**

<table>
<thead>
<tr>
<th>Test case ID: SW02</th>
<th>Name: VIN forwarding</th>
</tr>
</thead>
</table>

**Test description:** Once the VIN is extracted from the MSD string, it is forwarded to the national vehicle database or EUCARIS.

**Test steps:**
- MSD arrives from the MEB with a correct CRC;
- MSD manager decrypts the string and extracts data;
- VIN is present and recognized;
- A message containing VIN is forwarded to the national car database and/or EUCARIS.
- Remote database responds with information related to the presented VIN.

**Expected Result:**
Decryption operation is correct; Database is filled correctly with eCall data and VIN is correctly sent.
VIN is processed remotely and information is sent and correctly received.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

---

<table>
<thead>
<tr>
<th>Test case ID: SW03</th>
<th>Name: Collision information forwarding to ACI</th>
</tr>
</thead>
</table>

**Test description:** In case of relevant collision information, operator can forward information to ACI.

**Test steps:**
- MSD arrives from the MEB with a correct CRC;
- MSD manager decrypts the string and extracts data;
- Operator forwards information to ACI;
- Information is correctly forwarded to ACI remote database.

**Expected Result:**
Decryption operation is correct; Database is filled correctly with eCall data; The operator uses the function to forward collision information to ACI.
Information is correctly sent and ACK is received.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

---
5.5.2.2 Integration tests

A second phase of these tests will see the integration of the different modules, in subsequent steps:

IVS delivery of information (MSD + voice) to the MEB, through PBX interface, including the following tests from standard set of tests:

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>IVS calls 112 with correct MSD</td>
</tr>
<tr>
<td>102</td>
<td>Operator needs to update MSD</td>
</tr>
</tbody>
</table>

**TEST case area**

**Functional test**: IVS – PSAP modem

<table>
<thead>
<tr>
<th>Test case ID: Int03</th>
<th>Name: Test for incoming PSAP call-back request</th>
</tr>
</thead>
</table>

**Test Description**: IVS is called by PSAP and it answers the call

**Test steps**:
- IVS is able to connect microphone and headset in case of callback
- IVS is able automatically pick up the incoming call from PSAP

**Expected Result**: IVS answers the PSAP call-back and driver and PSAP operator are able to speak each other

**Actual Result**: OK / NOK / POK

**Problem Severity**:

**Problem Description**:

**Problem Resolution**:

**Notes**: Ok for the callback, but callback is accepted only if it arrives from the same number called for eCall (112) or bCall

**Date**: Tester:

MSD transmission between MEB and PSAP manager software, to include all cases to handle the different behaviour of the MSD transmissions. In addition to the tests included in paragraph 3.6.3, the session includes the following tests:

**TEST case area**

**Functional test**: MEB + MSD manager

<table>
<thead>
<tr>
<th>Test case ID: Int04</th>
<th>Name: MSD + voice communication OK.</th>
</tr>
</thead>
</table>

**Test description**: MSD + voice ok from automatic call; operator answers before the end of MSD decoding.

**Test steps**:
- An eCall with automatic flag is generated;
- MEB demodulates the MSD and calls the PSAP operator through the CTI;
- Operator answers the call before the demodulation and is put on hold;
- Demodulation ends, CTI receives the MSD string;
- MSD manager decodes the string and fills the event form.
# Test Case Area

## Functional Test: MEB + MSD Manager

### Test Case ID: Int05

**Name:** MSD + voice communication OK.

**Test Description:** MSD + voice ok from automatic call; operator answers after the end of MSD decoding.

**Test Steps:**
- An eCall with automatic flag is generated;
- MEB demodulates the MSD and calls the PSAP operator through the CTI;
- Demodulation ends, CTI receives the MSD string;
- MSD manager decodes the string and fills the event form;
- Operator answers the call after the demodulation and is put on conversation.

**Expected Result:** MSD is correctly demodulated and decoded; Event form is correctly filled; Call is correctly established, operator is put on conversation.

**Actual Result:** OK / NOK / POK

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

### Test Case ID: Int06

**Name:** MSD + voice communication OK.

**Test Description:** MSD + voice ok from manual call; operator answers before the end of MSD decoding.

**Test Steps:**
- An eCall with manual flag is generated;
- MEB demodulates the MSD and calls the PSAP operator through the CTI;
- Operator answers the call before the demodulation and is put on hold;
- Demodulation ends, CTI receives the MSD string;
- MSD manager decodes the string and fills the event form.

**Expected Result:** MSD is correctly demodulated and decoded; Event form is correctly filled; Call is correctly established, operator is put on conversation.

**Actual Result:** OK / NOK / POK

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>
### Expected Result:
Call is correctly established, operator is put on hold; MSD is correctly demodulated and decoded; Event form is correctly filled.

### Actual Result:
OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

---

**TEST case area**  
**Functional test :** MEB + MSD manager

<table>
<thead>
<tr>
<th>Test case ID</th>
<th>Name:</th>
<th>Test description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int07</td>
<td>MSD + voice communication OK.</td>
<td>MSD + voice ok from manual call; operator answers after the end of MSD decoding.</td>
</tr>
</tbody>
</table>

**Test steps:**
- An eCall with manual flag is generated;
- MEB demodulates the MSD and calls the PSAP operator through the CTI;
- Demodulation ends, CTI receives the MSD string;
- MSD manager decodes the string and fills the event form;
- Operator answers the call after the demodulation and is put on conversation.

**Expected Result:**
MSD is correctly demodulated and decoded; Event form is correctly filled; Call is correctly established, operator is put on conversation.

**Actual Result:**
OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

---

**TEST case area**  
**Functional test :** MEB + MSD manager

<table>
<thead>
<tr>
<th>Test case ID</th>
<th>Name:</th>
<th>Test description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int08</td>
<td>MSD KO, voice communication OK.</td>
<td>MSD with invalid CRC, voice call established anyway with indication of wrong CRC.</td>
</tr>
</tbody>
</table>

**Test steps:**
- An eCall with automatic flag is generated;
- MEB demodulates the MSD and calls the PSAP operator through the CTI;
- Demodulation ends but a CRC error is found, CTI doesn’t receive the MSD string;
- Operator answers the call and is put on conversation, but the form isn’t filled.

**Expected Result:**
MSD is not correctly demodulated and a CRC error is reported; Event form is not filled; Call is correctly established, operator is put on conversation.

**Actual Result:**
OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case area</td>
<td>Functional test : MEB + MSD manager</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Test case ID:</td>
<td>Int09</td>
</tr>
<tr>
<td>Test description:</td>
<td>Invalid MSD, voice call established anyway with indication of invalid MSD.</td>
</tr>
<tr>
<td>Test steps:</td>
<td>An eCall with automatic flag is generated; MEB demodulates the MSD and calls the PSAP operator through the CTI; Demodulation ends, CTI receives the MSD string, but invalid data is found; Operator answers the call and is put on conversation, but the form isn’t filled.</td>
</tr>
<tr>
<td>Expected Result:</td>
<td>MSD contains invalid data; Event form is not filled; Call is correctly established, operator is put on conversation.</td>
</tr>
<tr>
<td>Actual Result:</td>
<td>OK / NOK / POK</td>
</tr>
<tr>
<td>Problem Severity:</td>
<td></td>
</tr>
<tr>
<td>Problem Description:</td>
<td></td>
</tr>
<tr>
<td>Problem Resolution:</td>
<td></td>
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<tr>
<td>Notes:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td>Tester:</td>
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<table>
<thead>
<tr>
<th>Test case area</th>
<th>Functional test : MEB + MSD manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID:</td>
<td>Int10</td>
</tr>
<tr>
<td>Test description:</td>
<td>MSD initiation timeout, voice call established anyway.</td>
</tr>
<tr>
<td>Test steps:</td>
<td>Test steps:</td>
</tr>
<tr>
<td></td>
<td>An eCall with automatic flag is generated; MEB awaits for the MSD transmission and calls the PSAP operator through the CTI; Timeout for the MSD awaiting occurs, nothing is transferred to the CTI; Operator answers the call and is put on hold until the timeout occurs, then he is put in conversation, but the form isn’t filled.</td>
</tr>
<tr>
<td>Expected Result:</td>
<td>MSD never arrives; Event form is not filled; Call is correctly established, operator is put on conversation.</td>
</tr>
<tr>
<td>Actual Result:</td>
<td>OK / NOK / POK</td>
</tr>
<tr>
<td>Problem Severity:</td>
<td></td>
</tr>
<tr>
<td>Problem Description:</td>
<td></td>
</tr>
</tbody>
</table>
### TEST case area | Functional test : MEB + MSD manager
---|---
Test case ID: Int11 | Name: MSD advanced delivery.

#### Test description: MSD re-request from operator.

#### Test steps:
- An eCall with automatic flag is generated;
- MSD needs to be retransmitted, as a consequence of the previous Int08, Int09 or Int10;
- Operator commands the MEB to re-ask for the MSD;
- MEB asks again for the sending of the MSD, which is correctly delivered.

#### Expected Result:
Operator manually asks for a resending of the MSD;
MEB is engaged by the commands coming from the CTI and asks again for the MSD;
Operator is put on hold during the new demodulation phase, after which, operator is put on conversation again.

#### Actual Result: OK / NOK / POK

#### Problem Severity:

---

### TEST case area | Functional test : MEB + MSD manager
---|---
Test case ID: Int012 | Name: MSD advanced delivery.

#### Test description: Operator calls the IVS (for example, after a call interruption).

#### Test steps:
- An eCall with automatic flag is generated;
- Operations proceed as per test Int04;
- The call is interrupted, after the operator sees the event form filled;
- The operator issues a call towards the IVS, through the PBX, involving the MEB for a MSD retransmission;
- MEB receives the MSD and demodulates it, while the operator is on hold. CTI decrypts the MSD and fills the event form;
- Operator is put on conversation after the end of the demodulation.

#### Expected Result:
Operator calls back the IVS;
MEB is engaged by the commands coming from the CTI and makes the actual call, asking again for the MSD;
Operator is put on hold during the new demodulation phase, after which, operator is put on conversation again.

#### Actual Result: OK / NOK / POK

#### Problem Severity:
5.5.2.3 **Final installation tests**
This last phase will see the test of all the process, end-to-end, involving real vehicles circulating in the area covered by the PSAP pilot project, with a full delivery of the content, from the IVS to the PSAP operator and to external agencies.

The tests executed in this phase, will be a summary, taken from the previous steps, and applied to the whole system.

5.6 **Greece**

5.6.1 **Laboratory test set-up**

The eCall verification tests in Greece will be conducted using the actual hardware and software components in the laboratory, before their actual implementation in the vehicles and the PSAP centre, as follows. Logged vehicle data will be used to extract GPS positions to be transmitted via the MSD. Test software will be employed to simulate the manual and automatic activation of the eCall. This software will visualise the MSD content transmitted, it will store logs for evaluation of system performance and for comparison with the logs of the PSAP node and it will enable the visualisation of such log files.

The equipment to be used for the laboratory testing is shown below.
5.6.2 Test procedure

The laboratory tests will be conducted with the participation of one person, the test user, who will operate the test user interface on the part of the in-vehicle system and another person, the test responsible, who will operate the user interface of the PSAP side.

The test user will be able via the test user interface to manually initiate an eCall, to program the automatic initiation of eCalls and to monitor in general the behavior of the in-vehicle system in relation to the setup of the eCall. More precisely, the test user will be able to test the MSD transfer, the MSD transfer when conversation is ongoing, the behaviour of the in-vehicle system in relation to audio mute/un-mute and voice link establishment to PSAP operator, the behaviour of the in-vehicle system when eCall is dropped, in relation to eCall cleardown and in relation to manual eCall termination.

The tester will be able to test the reception of the eCall, the reception of the MSD, the voice link establishment to vehicle occupants, the eCall cleardown affected by the PSAP, the request and reception of a new MSD after call cleardown and the call back to the vehicle occupants after call cleardown.

Log files will be maintained regarding the actions performed by the test user, the test responsible and the systems both at the in-vehicle system side and at the PSAP side.
Comparative analysis of these log files will assist the evaluation of the performance of the complete system and the analysis of conformance to requirements.

### 5.6.3 Test cases

**TEST case area** | **Unit test : IVS**
--- | ---

**Test case ID:** G001  
**Name:** Manual initiation of eCall

**Test Description:** The test user manually initiates an eCall.

**Test steps:**
- IVS is launched and indicates status.
- The test user presses the “manual” button.
- eCall is received by the eCall call- centre.
- Log data are stored.

**Expected Result:** activation - status indication – call reception

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**

---

**TEST case area** | **Unit test : IVS**
--- | ---

**Test case ID:** G002  
**Name:** Automatic initiation of eCall

**Test Description:** The test user programs an automatic initiation of an eCall.

**Test steps:**
- IVS is launched and indicates status.
- The test user sets a time for the automatic initiation of an eCall.
- At this time point, an eCall is initiated by the IVS by receiving a signal simulating the airbag activation.
- eCall is received by the eCall call- centre.
- Log data are stored.

**Expected Result:** activation - status indication – call reception

**Actual Result:** OK / NOK / POK
Problem Severity:

Problem Description:

Problem Resolution:

Notes:

Date:  
Tester:  

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : IVS – PSAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: G003</td>
<td>Name: Correctness of transmitted MSD</td>
</tr>
</tbody>
</table>

Test Description: The test user programs the data required for the MSD, the MSD is stored locally and assessed for correctness.

Test steps:

- IVS is launched and indicates status.
- The test user programs the data required for the MSD in the test user interface.
- The test user presses the “manual” button.
- eCall is initiated by the IVS.
- eCall is received by the eCall call-centre.
- MSD is decoded in the PSAP server.
- Log data are stored.
- The MSD content in the IVS and in the PSAP are compared.

Expected Result: Complete and correct MSD at the PSAP node, with same content as that programme by the test user.

Actual Result: OK / NOK / POK

Problem Severity:

Problem Description:

Problem Resolution:

Notes:

Date:  
Tester:  

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : IVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: G004</td>
<td>Name: Audio mute / unmute and voice link establishment</td>
</tr>
</tbody>
</table>

Test Description: The tester evaluates the audio mute / unmute by the IVS and the
Test steps:
- IVS is launched and indicates status.
- The test user programs the data required for the MSD in the test user interface.
- The test user presses the “manual” button.
- eCall is initiated by the IVS.
- eCall is received by the eCall call centre.
- IVS disconnects microphone and speakers and sends MSD.
- After MSD transmission, IVS connects microphone and speakers.
- Log data are stored.

**Expected Result:** Audio devices disconnected by the IVS after eCall reception and re-connection after MSD transfer. Successful voice link establishment.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Functional test : IVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID:</td>
<td>G005</td>
</tr>
<tr>
<td>Name:</td>
<td>eCall termination</td>
</tr>
</tbody>
</table>

**Test Description:** After an eCall has been established, it is correctly terminated.

**Test steps:**
- The tester terminates the eCall or sends a clear-down via the software.
- The IVS terminates the eCall.

**Expected Result:** eCall is correctly terminated

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**
# System test cases and verification report

<table>
<thead>
<tr>
<th>Notes:</th>
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<tr>
<td>Date:</td>
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<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : PSAP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> G006</td>
<td><strong>Name:</strong> VIN query results</td>
</tr>
</tbody>
</table>

**Test Description:** The data relevant to the VIN in the MSD are queried in the VIN database and shown on the test responsible’s screen.

**Test steps:**
- After the MSD is decoded, the VIN database is queried.
- The query results are shown on the test responsible’s screen.

**Expected Result:** Correct data for the VIN encoded in the MSD are shown on the test responsible’s screen.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

<table>
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<th>Notes:</th>
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<tr>
<td>Date:</td>
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</table>

## 5.7 Sweden

### 5.7.1 Testing Environment Overview

Two different OBU:s will be tested:
- ACTIA Embedded IVS
- Ericsson Test IVS

Two different PSAP equipment’s will be tested
- Ericsson CoordCom (same equipment that is used at SOS Alarm, the Swedish PSAP)
- Ericsson Test IVS
Two PLMN will be tested:

- TeliaSonera
- Telenor

Also Ericsson will test the network in Aachen, this will allow to test the OBU eCall flag “Service Category” setting before going into a live network.

The equipment has been developed independently, this is important as this will minimise the risk for an OK result due to carry over of implementation from one equipment to another (if same mistake in for example ASN1 decoder/encoder is made in the OBU and PSAP the result might be OK).

5.7.2 Test cases - IVS

The tests are focused on the OBU as the complete IVS not is tested for example the ability of the Airbag Control Unit to detect a crash and send an Automatic eCall trigger to the OBU will not be tested.

The focus is on the OBU – PSAP communication path. The Swedish Pilot Site follows some tests which depart from the standard set of tests.

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>017</td>
<td>In-band modem basic functionality test</td>
</tr>
<tr>
<td>018</td>
<td>Test of MSD sending</td>
</tr>
<tr>
<td>019</td>
<td>Test of maximum duration of in-band modem messages transmission</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Functional test: OBU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: S001</td>
<td>Name: Power-up OBU configured for eCall only</td>
</tr>
<tr>
<td>Test Description: OBU shall not make registration on a PLMN</td>
<td></td>
</tr>
<tr>
<td>Test steps:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Power up the OBU and verify that the OBU not register on a PLMN</td>
</tr>
<tr>
<td></td>
<td>• Activate a eCall an verify that the OBU register on a PLMN</td>
</tr>
<tr>
<td>Expected Result:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The OBU dies not register on a PLMN at Power-up</td>
</tr>
<tr>
<td></td>
<td>• The OBU register on a PLMN when eCall is initiated</td>
</tr>
<tr>
<td>Actual Result:</td>
<td>OK / NOK / POK</td>
</tr>
<tr>
<td>Problem Severity:</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
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</tr>
<tr>
<td>Problem Description:</td>
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<td>Problem Resolution:</td>
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<td>Notes:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td>Tester:</td>
</tr>
<tr>
<td>TEST case area</td>
<td>Functional test: OBU</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Test case ID: S002</td>
<td>Name: Power-up OBU not configured for eCall only (commercial services)</td>
</tr>
</tbody>
</table>

**Test Description:** OBU shall make registration on a PLMN

**Test steps:**
- Power up the OBU and verify that the OBU register on a PLMN

**Expected Result:**
- The OBU register on a PLMN at Power-up

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** | **Tester:**
---|---

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### TEST case area

<table>
<thead>
<tr>
<th>Functional test: OBU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: S003</td>
</tr>
<tr>
<td>Name: MSD Generation and ASN1 decoding</td>
</tr>
</tbody>
</table>

#### Test Description:

MSD data is collected and decoded

#### Test steps:

- OBU is able to generate a correct MSD format
- OBU is able to ASN1 decode the generated MSD

#### Expected Result: MSD is correct composed and decoded (EN_15722)

#### Actual Result: OK / NOK / POK

#### Problem Severity:

#### Problem Description:

#### Problem Resolution:

#### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
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</table>
### Test Case Area: Functional: OBU

<table>
<thead>
<tr>
<th>Test Case ID: S004</th>
<th>Name: eCall flag</th>
</tr>
</thead>
</table>

#### Test Description:

OBU NAD sets the eCall flag (service category)

#### Test Steps:

- Activate a manual eCall and verify that the “service category” is correctly set
- Activate an automatic eCall and verify that the “service category” is correctly set

This test can be tested in network where the MSC is able to handle eCall flag in the call set-up message

#### Expected Result:

The correct bit field shall be set

- bit 1  Police
- bit 2  Ambulance
- bit 3  Fire Brigade
- bit 4  Marine Guard
- bit 5  Mountain Rescue
- bit 6  Manually initiated eCall
- bit 7  Automatically initiated eCall
- bit 8  Is spare and set to "0"

#### Actual Result:

OK / NOK / POK

#### Problem Severity:

#### Problem Description:

#### Problem Resolution:

#### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST case area</td>
<td>Functional test: OBU</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Test case ID: S005</td>
<td>Name: PSAP- OBU Pull-REQ</td>
</tr>
</tbody>
</table>

**Test Description:**
The PSAP operator shall be able to require the latest MSD during the conversation with the vehicle occupants.

**Test steps:**
- OBU receives a PULL-REQ
- OBU disconnect microphone and speaker for the voice communication
- OBU sends MSD
- OBU receive HL-ACK (positive)
- OBU reconnect microphone and speaker for the voice communication

**Expected Result:** Latest MSD is sent to the PSAP

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
## TEST case area

<table>
<thead>
<tr>
<th>Functional test : OBU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> S006</td>
</tr>
</tbody>
</table>

### Test Description:
OBU is called by PSAP and it answers the call

### Test steps:
- OBU is able automatically pick up the incoming call from PSAP
- OBU is able to connect microphone and headset in case of call-back

### Expected Result:
OBU answers the PSAP call-back and driver and PSAP operator are able to speak each other

### Actual Result:
OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

### Date: 
**Tester:**
### TEST case area

<table>
<thead>
<tr>
<th>Test case ID: S007</th>
<th>Name: PSAP - OBU Clear-down / Hang-up</th>
</tr>
</thead>
</table>

#### Test Description:

After the OBU has received the LL-ACK or T5 – OBU wait for SEND MSD period or T7 – IVS MSD maximum transmission time ends, the OBU shall recognise a normal hang-up from the network → the OBU shall clear down the call.

After the PSAP has sent the LL-ACK or T4 – PSAP wait for INITIATION signal period or T8 - PSAP MSD maximum reception time ends and the OBU receives a AL-ACK with status = “clear down” → The OBU shall clear down the call.

Description of timers T5 – T7 can be found in D2.1 State of the art analysis, operational and functional requirements - Table 1: Timings.

#### Test steps:

- The OBU recognize a normal hang-up from the network
- The PSAP send HL-ACK with status “clear down” to the OBU

#### Expected Result: The OBU clear down the call

#### Actual Result: OK / NOK / POK

#### Problem Severity:

#### Problem Description:

#### Problem Resolution:

#### Notes:

<p>| Date: | Tester: |</p>
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Functional test: OBU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> S008</td>
<td><strong>Name:</strong> Lost communication with PSAP</td>
</tr>
</tbody>
</table>

**Test Description:**
OBU behaviour if communication with PSAP is dropped (lost) during on-going eCall session (caused by for example bad coverage)

**Test steps:**
- OBU has received HL-ACK (positive)
- Call is dropped
- OBU shall perform an automatic redial

**Expected Result:** OBU shall perform an automatic redial

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
## Test cases - PLMN

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : PLMN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID:</td>
<td>S101</td>
</tr>
<tr>
<td>Name:</td>
<td>eCall flag “Service category” handling in MSC</td>
</tr>
</tbody>
</table>

### Test Description:

Verify that MSC handles eCall flag correctly, a 112 call with the “service category” bit according to the table below is initiated → the call shall be forwarded to the destination number associated with the corresponding service category in the in MSC router table.

- bit 1: Police
- bit 2: Ambulance
- bit 3: Fire Brigade
- bit 4: Marine Guard
- bit 5: mountain Rescue
- bit 6: Manually initiated eCall
- bit 7: automatically initiated eCall
- bit 8: is spare and set to "0"

### Test steps:

- Initiate 112 call with service category bit 1
- Initiate 112 call with service category bit 2
- Initiate 112 call with service category bit 3
- Initiate 112 call with service category bit 4
- Initiate 112 call with service category bit 5
- Initiate 112 call with service category bit 6
- Initiate 112 call with service category bit 7
- Initiate 112 call with service category bit 8

### Expected Result:
The 112 Call is forwarded correct destination number.

### Actual Result:
OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
<tbody>
<tr>
<td>29/01/2013</td>
<td></td>
</tr>
</tbody>
</table>
5.7.3 Test cases PSAP – call centre part

<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : PSAP modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID:</td>
<td>S201</td>
</tr>
<tr>
<td>Name:</td>
<td>IVS calls 112 with correct MSD</td>
</tr>
</tbody>
</table>

**Test Description:**
The IVS calls the PSAP and sends correct MSD

**Test steps:**
- Automatically: the call from the IVS is answered
- Automatically: the PSAP is in communication with the IVS
- Automatically: A case is created in the CoordCom system and distributed to relevant operators.
- Automatically: the PSAP modem collects the MSD
- Manually: one of the CoordCom operators accepts the case.
- Automatically: the PSAP modem checks the validity of the MSD data
- Automatically: the PSAP modem sends HL-ACK to the IVS with the positive status
- Automatically: the phone calls voice becomes available for the CoordCom operator which has accepted the case.

**Expected Result:**
The answering operator is made aware that the case handles an eCall.
The answering operator is made aware that the voice call is not connected to the operator initially.
MSD results are made available for the CoordCom operator in the User interface.
The answering operator is made aware that the voice call is connected to the operator.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : PSAP modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: S202</td>
<td>Name: IVS calls 112 with invalid MSD</td>
</tr>
</tbody>
</table>

**Test Description:**

IVS calls 112 with invalid MSD.
The MSD will say 255 passengers.

**Test steps:**

- Manually: Set up an eCall as described in S201.
- Manually: the CoordCom operator notices the improbable value of 255 passengers and asks the caller for confirmation.
- Manually: the Caller informs the CoordCom operator that there are 3 people in the vehicle
- Manually: the CoordCom operator updates the case with correct information.

**Expected Result:**

Initially the case is listed with 255 people in the vehicle.
After update it is changed to 3.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
</table>

29/01/2013 134 Version 1.1
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : PSAP modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID: S203</td>
<td>Name: IVS calls 112 with invalid CRC first attempt</td>
</tr>
</tbody>
</table>

**Test Description:**
The IVS calls the PSAP and sends an incorrect CRC first attempt.

**Test steps:**
- Automatically: the call from the IVS is answered
- Automatically: the PSAP is in communication with the IVS
- Automatically: A case is created in the CoordCom system and distributed to relevant operators.
- Automatically: the PSAP modem collects the MSD (faulty CCR)
- Manually: one of the CoordCom operators accepts the case.
- Automatically: the PSAP modem sends LL-ACK to the IVS with the negative status
- Automatically: the IVS makes a new attempt to send MSD
- Automatically: the PSAP modem collects the MSD (correct CCR)
- Automatically: the PSAP modem sends HL-ACK to the IVS with the positive status
- Automatically: the phone calls voice becomes available for the CoordCom operator which has accepted the case.

**Expected Result:**
It takes longer than normal to receive MSD and connect the voice to the CoordCom Operator, but else there is no difference.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
## Test case area

<table>
<thead>
<tr>
<th>Test case area</th>
<th>Unit test: PSAP modem</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test case ID:</strong> S204</td>
<td><strong>Name:</strong> IVS calls 112 with invalid CRC whole session</td>
</tr>
</tbody>
</table>

### Test Description:

The IVS calls the PSAP and sends a wrong CRC whole session.

### Test steps:

- Automatically: the call from the IVS is answered
- Automatically: the PSAP is in communication with the IVS
- Automatically: A case is created in the CoordCom system and distributed to relevant operators.
- Automatically: the PSAP modem collects the MSD (faulty CCR)
- Manually: one of the CoordCom operators accepts the case.
- Automatically: the PSAP modem sends LL-ACK to the IVS with the negative status
- Automatically: the IVS makes a new attempt to send MSD
- Automatically: the PSAP modem collects the MSD (faulty CCR)
- Automatically: This repeats until the session times out
- Automatically: the phone calls voice becomes available for the CoordCom operator which has accepted the case.
- Automatically: the MSD fields are still uninitialized

### Expected Result:

The call is eventually connected to the CoordCom operator who will not get any support from an MSD.

### Actual Result:

OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

### Date: 29/01/2013  
### Tester:
### TEST case ID: S205

**Name:** Call from a non-IVS reaches PSAP on designated eCall number

**Test Description:**

Call from a non-IVS reaches PSAP on designated eCall number

When the IVS call makes an eCall it calls 112 with the eCall flag set. The PLMN identifies it as an eCall and decides which phone number it should be forwarded to for the eCall to reach the correct PSAP. Possibly that number can be reached by a normal phone which dials the wrong number.

**Test steps:**

- Automatically: the call from the phone is answered
- Automatically: the PSAP tries to communicate with the supposed IVS
- Automatically: A case is created in the CoordCom system and distributed to relevant operators.
- Automatically: the PSAP modem fails to get an MSD from the phone
- Automatically: This repeats until the session times out
- Automatically: the phone calls voice becomes available for the CoordCom operator which has accepted the case.
- Automatically: the MSD fields are still uninitialized

**Expected Result:**

The call is eventually connected to the CoordCom operator who will not get any support from an MSD.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**

**Tester:**
**TEST case area**  |  **Unit test : PSAP modem**
---|---
**Test case ID:** S206  |  **Name:** Call disconnected by network.

**Test Description:**
For different reasons a call may be disconnected by the network, if so the IVS should call the PSAP again.

**Test steps:**
- Manually: Set up an eCall as described in S201.
- Manually: The CoordCom operator and the caller communicates
- Manually: The IVS is put in a Faraday cage
- Automatically: the phone call is disconnected by the network
- Manually: The IVS is taken out of the Faraday cage
- Automatically: the IVS calls again
- Automatically: the call from the IVS is answered
- Automatically: the PSAP is in communication with the IVS
- Automatically: A case is created in the CoordCom system and distributed to relevant operators.
- Automatically: the PSAP modem collects the MSD
- Manually: one of the CoordCom operators accepts the case.
- Automatically: the PSAP modem checks the validity of the MSD data
- Automatically: the PSAP modem sends HL-ACK to the IVS with the positive status
- Automatically: the phone calls voice becomes available for the CoordCom operator which has accepted the case.
- Automatically: The CoordCom operator sees a related Case in the list
- Manually: The CoordCom operator associates the two cases.
- Manually: The CoordCom operator and the caller continue the communication.

**Expected Result:**
Even though an eCall is disconnected the call will be automatically reconnected and no information gathered should be lost.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:**  |  **Tester:**
---|---
29/01/2013  |  

Version 1.1
<table>
<thead>
<tr>
<th>TEST case area</th>
<th>Unit test : PSAP modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test case ID:</td>
<td>S207</td>
</tr>
<tr>
<td>Name:</td>
<td>Call termination from PSAP</td>
</tr>
</tbody>
</table>

**Test Description:**
When the CoordCom Operator terminates the call, the call shall not be automatically reconnected, as when network terminates the call.

**Test steps:**
- Manually: Set up an eCall as described in S201.
- Manually: the CoordCom Operator says goodbye and hangs up.
- Manually: The CoordCom operator and the caller continue the communication communicates.

**Expected Result:**
When PSAP disconnects the call it stays disconnected.

**Actual Result:**  OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Tester:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**TEST case area** | **Unit test : PSAP modem**
--- | ---
**Test case ID:** S208 | **Name:** PSAP call-back

**Test Description:**
The CoordCom Operator wants to be able to easily call back to the IVS to the caller if the CoordCom operator gets more information.

**Test steps:**
- Manually: Set up and disconnect an eCall as described in S207.
- Manually: From the CoordCom case call back to the IVS.
- Automatically: the IVS answers the call.

**Expected Result:**
An IVS automatically answers when PSAP calls back within a given time frame.

**Actual Result:** OK / NOK / POK

**Problem Severity:**

**Problem Description:**

**Problem Resolution:**

**Notes:**

**Date:** | **Tester:**
### TEST case area

| Test case ID: S209 | Name: Operator needs to update MSD |

### Test Description:
The Operator needs updated information from IVS.

### Test steps:
- Manually: Set up an eCall as described in S201.
- Manually: The CoordCom operator requests an MSD
- Automatically: the voice path of the call is disconnected from the CoordCom Operator and instead connected to the PSAP modem
- Automatically: the PSAP is in communication with the IVS
- Automatically: the PSAP modem collects the MSD
- Automatically: the PSAP modem checks the validity of the MSD data
- Automatically: the PSAP modem sends HL-ACK to the IVS with the positive status
- Automatically: the phone calls voice becomes available for the CoordCom operator again.
- Automatically: the case is populated with the updated MSD information.
- Automatically: the previous MSD information is still available

### Expected Result:
When an operator requests a new MSD, the voice path will be temporarily disconnected and then reestablished and the new MSD information will be used in the case.

### Actual Result:  OK / NOK / POK

### Problem Severity:

### Problem Description:

### Problem Resolution:

### Notes:

### Date:  Tester:
## TEST case area

<table>
<thead>
<tr>
<th>Test case ID: S210</th>
<th>Name: Update MSD with invalid MSD</th>
</tr>
</thead>
</table>

## Test Description:
The IVS sends in an invalid MSD when the CoordCom operator requests an updated MSD. The MSD will say 255 passengers.

## Test steps:
- Manually: Set up an eCall as described in S201.
- Manually: The CoordCom operator requests an MSD
- Automatically: the voice path of the call is disconnected from the CoordCom Operator and instead connected to the PSAP modem
- Automatically: the PSAP is in communication with the IVS
- Automatically: the PSAP modem collects the MSD
- Automatically: the PSAP modem checks the validity of the MSD data
- Automatically: the PSAP modem sends HL-ACK to the IVS with the positive status
- Automatically: the phone calls voice becomes available for the CoordCom operator again.
- Automatically: the case is populated with the updated MSD information.
- Automatically: the previous MSD information is still available
- Manually: the CoordCom operator notices the improbable value of 255 passengers and asks the caller for confirmation.
- Manually: the caller informs the CoordCom operator that there are 3 people in the vehicle
- Manually: the CoordCom operator updates the case with correct information.

## Expected Result:
Initially the case is listed with 255 people in the vehicle, after update it is changed to 3.

## Actual Result:  OK / NOK / POK

## Problem Severity:

## Problem Description:

## Problem Resolution:

## Notes:

## Date:  |  Tester:
---------|----------
5.8 Croatia

5.8.1 Croatian eCall test site

The components of the Croatian eCall Pilot Architecture are presented on Fig HR-1.

Croatian eCall Pilot Architecture comprises the following components: IVS units (both the IVS simulator and commercial-grade units), Mobile network, PSAP. These are to be implemented at the Croatian test site.

**eCall (IVS)**

The eCall IVS units (both IVS simulator and commercial-grade units) are to be deployed as the Croatian eCall test bed components. The IVS units comprise features for setting up the eCall according to the most recent 3GPP and CEN eCall standards. The IVS will be configured to dial either 112 call with eCall discriminator, or to dial directly the PSAP number.

**MNO**

Both laboratory and real-network eCall test-beds will be deployed for the Croatian eCall Pilot activities. The eCall laboratory MNO component consists of fully functional mobile network, including the Radio Access Network (RAN) and the Mobile Switching Centre (MSC). The MSC is connected to the PSAP over standardised telecom infrastructure (which means what?). The MSC software release is eCall discriminator-enabled, which allows for proper routing of the eCalls to eCall-enabled PSAP.

**PSAP**

The PSAP component is fully eCall-enabled. After the eCall is received, an on-screen message is presented to the PSAP operator, and the PSAP operator is able to answer the
eCall voice communication according to the eCall-related standards. An PSAP event logger is deployed, thus allowing for log maintenance and log transfer for further analysis.

5.8.2 Croatia test plans

The Croatian eCall Pilot examines the IVS in the eCall laboratory that emulates end-to-end eCall service chain (i.e. the eCall-enabled mobile network appropriately connected with eCall-enabled PSAP).

1. Set up test cases which will verify the proper installation and configuration of IVS, MNO and PSAP.

2. A set of Key Performance Indicators (KPIs) is to be monitored and the KPIs’ values collected during the eCall service chain. of KPIs is given below.
   a. eCall success rate
   b. MSD success rate
   c. Time for voice channel establishment
   d. Time for MSD transmission
   e. Duration of voice channel blocking

3. The eCall laboratory examination comprises the set of testing scenarios, as depicted on Fig 1. IVS unit is examined for interoperability by utilisation of the roaming SIM vehicled. The eCall initiation is either automatic (A), or manual (M). The IVS is also tested for performance under repeated initiations. Examinations (tests) will be conducted in series, with 2 min sampling intervals.

<table>
<thead>
<tr>
<th>Code</th>
<th>No of IVS units involved</th>
<th>No of IVS units in roaming</th>
<th>eCall initiation</th>
<th>No of repeated initiations</th>
<th>No of tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>1</td>
<td>0</td>
<td>A</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>L2</td>
<td>1</td>
<td>1</td>
<td>A</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>L3</td>
<td>1</td>
<td>0</td>
<td>M</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>L4</td>
<td>1</td>
<td>1</td>
<td>M</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>L5</td>
<td>1</td>
<td>0</td>
<td>M</td>
<td>3</td>
<td>300</td>
</tr>
<tr>
<td>L6</td>
<td>1</td>
<td>1</td>
<td>M</td>
<td>3</td>
<td>300</td>
</tr>
<tr>
<td>L7</td>
<td>1</td>
<td>0</td>
<td>A</td>
<td>3</td>
<td>300</td>
</tr>
</tbody>
</table>

Figure 9: The eCall IVS laboratory testing scenarios
4. Position estimation testing

Position estimation for eCall testing are to be tested by performing independent tests of GPS vs. GPS/GLONASS vs. GPS/EGNOS where position samples are to be taken continuously every 2 sec in one hour periods.

5.8.3 Test Cases

The Croatia follows some tests from standard set of tests, which are listed in Annex A:

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Test of OBU activation</td>
</tr>
<tr>
<td>002</td>
<td>Test of OBU activation II</td>
</tr>
<tr>
<td>003</td>
<td>Test of GPRS functionality</td>
</tr>
<tr>
<td>004</td>
<td>Test of power consumption</td>
</tr>
<tr>
<td>005</td>
<td>Vehicle communication bus connection test</td>
</tr>
<tr>
<td>006</td>
<td>GNSS module test</td>
</tr>
<tr>
<td>007</td>
<td>GSM module test</td>
</tr>
<tr>
<td>008</td>
<td>OBU reflashing test</td>
</tr>
<tr>
<td>009</td>
<td>OBU configuration test</td>
</tr>
<tr>
<td>010</td>
<td>Test for incoming PSAP call-back request</td>
</tr>
<tr>
<td>011</td>
<td>Actual MSD gathering test</td>
</tr>
<tr>
<td>012</td>
<td>eCall triggering test</td>
</tr>
<tr>
<td>013</td>
<td>eCall triggering test II</td>
</tr>
<tr>
<td>014</td>
<td>Test of non-interruption of the established eCall</td>
</tr>
<tr>
<td>015</td>
<td>Test of operating requirements for error handling</td>
</tr>
<tr>
<td>016</td>
<td>eCall termination test</td>
</tr>
<tr>
<td>017</td>
<td>In-band modem basic functionality test</td>
</tr>
<tr>
<td>018</td>
<td>Test of MSD sending</td>
</tr>
<tr>
<td>019</td>
<td>Test of maximum duration of in-band modem messages transmission</td>
</tr>
<tr>
<td>101</td>
<td>IVS calls 112 with correct MSD</td>
</tr>
<tr>
<td>102</td>
<td>Operator needs to update MSD</td>
</tr>
</tbody>
</table>
5.9 Netherlands

5.9.1 Introduction

Following a decision of the European Parliament, and a request by the European Commission to ETSI, ETSI TC MSG and CEN were tasked with managing the technical specification and creation of open standards for the Pan-European eCall emergency service.

An eCall is an emergency voice call, initiated manually or automatically from a vehicle to a Public Safety Answering Point (PSAP), supplemented by up to 140 bytes of incident related data. The Minimum Set of Data (MSD) has been defined by CEN Technical Committee 278 and includes the GNSS derived location and direction of travel of the vehicle, the Vehicle Identification Number (VIN) and other information to enable the emergency response teams
to quickly locate and provide medical and other life saving assistance to the collision victims.

eCall has been designed to operate over any PLMN that supports emergency voice calls, specifically TeleService 12. Should the MSD not be transmitted or received for any reason, or if the PSAP is not equipped with the necessary eCall equipment (eCall modem / server), the collision victims and PSAP operator may still converse using the In-Vehicle System (IVS) audio equipment.

The 3rd Generation Partnership Project (3GPP) has specified the eCall service requirements, data transmission protocols and network signaling aspects for Release 8. The in-band modem used to transfer the MSD from the vehicle to the PSAP, following the establishment of a TS12 emergency voice call, has been specified by 3GPP TSG SA WG 4.

Once an eCall is invoked, initiated manually by the vehicle occupants or automatically as the result of a collision, the eCall call set-up and clear-down procedures (RR, CC, and MM) are automatically controlled by the eCall in-vehicle system (IVS) and its associated network access device (NAD). Once initiated the system requires no MMI intervention and does not permit the user to intervene at any stage during call management. It is important, therefore, that the eCall system works autonomously and reliably when faced with a wide range of probable network access events.

5.9.1.1 ETSI / 3GPP specifications and applicable releases
Care should be taken to ensure that the latest published version of the relevant ETSI / 3GPP specification is used. Although some eCall service requirements and the eCall in-band modem used to transfer the MSD from the vehicle to the PSAP were specified in earlier releases, as a general principle, only Release 8.6.0, Release 9.3.0 or Release 10 specifications, or later versions, should be used. This is because some essential corrections were made to the in-band modem specifications in Release 8.6.0 that are not backward compatible with earlier versions. ETSI / 3GPP have given an undertaking that any future changes that may be needed will be backward compatible with Release 8.6.0 and later versions of the 3GPP eCall in-band modem specifications.

5.9.1.2 General aspects of eCall conformance testing
The eCall service is based on the pan-Europian harmonised 112 emergency service supplemented by collision related data. An eCall is initiated automatically when a collision of sufficient severity occurs, or manually by the vehicle occupants. Once initiated the eCall proceeds automatically without the need for any user intervention. As a life saving
emergency service the correct operation and reliability of the autonomous eCall system needs to be ensured through conformance testing.

5.9.1.3  **eCall device and eCall system end-to-end conformance testing**

eCall device and system conformance requirements and conformance tests can be divided into 3 main areas:

- Radio access network protocol conformance tests (device tests) (ETSI / 3GPP)
- eCall in-band modem conformance tests (device tests) (ETSI / 3GPP)
- eCall system (IVS, Mobile Network, PSAP conformance tests (End-to-End) (CEN)

The Radio Access Network conformance tests will normally be performed in an accredited laboratory as part of the wireless module (GCF) certification process. The in-band modem conformance tests also require specialist test equipment to verify the bit exact ANSI-C reference code and modem signalling. End-to-End Conformance tests, as specified by CEN, are then to be used to verify correct operation and interworking between the IVS and PSAP. This includes verification of the MSD and High Level Application Protocol timings and procedures.

A with any electronic device, before being CE marked and placed on the market, a declaration of conformance to the R&TTE Directive is required. Compliance may be demonstrated using the applicable ETSI harmonised standards.

5.9.1.4  **Types of eCall IVS – Unrestricted and Restricted**

In order to avoid the generation of large volumes of unnecessary mobility management (MM) signaling, when not engaged in an eCall, test or reconfiguration call, additional network access restrictions apply to certain ‘eCall only’ devices in accordance with TS 122 101.

eCall capable UEs are divided into two types, unrestricted and restricted. Unrestricted eCall UEs are those that have the capability and are configured to also access other non-emergency subscription services. Restricted eCall UEs are those that either do not support the capability to access other non-emergency services, or are normally unrestricted eCall UEs that have been configured to make only eCalls. In the later case the restricted eCall capable UE is referred to as an ‘eCall only’ UE.

All eCall capable UEs may make calls to a network operator designated non-emergency numbers for the purpose of making test eCalls, and to request reconfiguration of the UE allowing access to commercial services.
5.9.1.5 Establishment of eCalls by the UE under test
A Manually Initiated eCall (MleC) or an Automatically Initiated eCall (AleC) is initiated in accordance with the information provided by the manufacturer in the Implementation Conformance Statement (ICS) proforma.

The eCall capable UE is expected to provide a call set-up MMI that enables the user to manually establish an eCall e.g. an SOS button. Additionally, an eCall capable UE is expected to support an interface that allows an associated eCall in-vehicle system (IVS) to automatically initiate an eCall. The emergency call set-up message sent to the network includes, in the Service Category information element, an indication that the present call is either a Manually Initiated eCall (MleC) or an Automatically Initiated eCall (AleC).

5.9.1.6 Establishment of eCall test and reconfiguration calls
An eCall test or reconfiguration call is initiated in accordance with the information provided by the manufacturer in the Implementation Conformance Statement (ICS) proforma.

The purpose of the eCall test and reconfiguration calls is to ensure that the UE under test, when configured for ‘eCall only’, is capable of establishing a call to each of the non-emergency fixed dialling numbers stored on the USIM in EF_{FDN}. It is also verified that, following call clear-down, an ‘eCall only’ UE deregisters from the network and returns to the MM IDLE eCall INACTIVE state when timer T3242 or T3243 expires (as specified in ETSI TS 124 008).

The eCall capable UE provides a call set-up MMI that enables test and reconfiguration calls to be established using the dialled numbers stored on the USIM in EF_{FDN} or, in the case of an unrestricted eCall capable UE, in EF_{SDN}.

5.9.2 eCall IVS conformance testing – Radio Access (General)
There are many general radio access requirements and conformance tests specified by ETSI/3GPP for mobile phones and wireless modules, variously referred to as User Equipment (UE), or Mobile Station (MS), or as Network Access Devices (NAD). These tests are performed to ensure that the mobile device connects correctly and does not cause harm to the mobile network. There are however specific tests for eCall IVS NADs (UE, MS).

5.9.2.1 eCall IVS conformance testing – Radio Access (eCall specific)
There are a total of 6 GSM and 6 UMTS radio access conformance tests specified for eCall IVS Network Access Devices (NAD). These are specified in ETSI TS 102 936 Parts 1 & 2, and the detailed tests can be found in ETSI TS 134 123 (UMTS) and ETSI 151 010 (GSM) specifications.
The purpose of the tests is to ensure that when an eCall is initiated either manually or automatically:

- the eCall identifier (flag) is set correctly in the call set-up message sent to the mobile network, in accordance with ETSI TS 124 008;
- an IVS that is designed / configured for eCall 'only' does not attempt to register on a network except when an eCall or test call (to a pre-programmed number) has been initiated;
- an IVS that is designed / configured for eCall 'only' de-registers from the network within 12 hours, following call clear down.

A summary of the eCall NAD radio access conformance tests for both 2G (GSM) and 3G (UMTS) networks are shown in tables 1 and 2 respectively.

<table>
<thead>
<tr>
<th>Clause</th>
<th>Title</th>
<th>Release</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.9.6a</td>
<td>Structured Calls / eCall</td>
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<td>26.9.6a.1</td>
<td>eCall with USIM</td>
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<tr>
<td>26.9.6a.1.2</td>
<td>Test call using eCall capable MS with 'eCall only' subscription on USIM</td>
<td>Rel-8</td>
<td>MS supporting 'eCall only' subscription and capable of triggering a test eCall</td>
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<tr>
<td>26.9.6a.1.3</td>
<td>Manually initiated eCall using eCall capable MS with 'eCall only' subscription on USIM</td>
<td>Rel-8</td>
<td>MS supporting 'eCall only' subscription and capable of initiating manual eCall</td>
</tr>
<tr>
<td>26.9.6a.1.4</td>
<td>Manually initiated eCall using eCall capable MS with eCall capable USIM</td>
<td>Rel-8</td>
<td>MS supporting emergency speech call and eCall subscription and capable of initiating manual eCall</td>
</tr>
<tr>
<td>26.9.6a.1.5</td>
<td>eCall Inactivity State after T3242 expires</td>
<td>Rel-8</td>
<td>MS supporting 'eCall only' subscription and capable of initiating manual eCall</td>
</tr>
<tr>
<td>26.9.6a.1.6</td>
<td>Automatically initiated eCall</td>
<td>Rel-8</td>
<td>MS supporting emergency speech and 'eCall only' subscription and capable of initiating automatic eCall</td>
</tr>
<tr>
<td>26.9.6a.1.7</td>
<td>Reconfiguration call using eCall capable MS with 'eCall only' subscription on USIM</td>
<td>Rel-8</td>
<td>MS supporting 'eCall only' subscription and capable of triggering a reconfiguration call</td>
</tr>
</tbody>
</table>

Table 2: GSM radio network access network applicability tests (TS 151 010)
Table 3: UMTS radio network access network applicability tests (TS 134 123)

5.9.3  eCall In-Band Modem conformance tests

Conformance testing of the ETSI / 3GPP specified eCall In-Band Modem, described in ETSI TS 126 267, is specified in ETSI TS 126 269. The latest version of this specification should be downloaded from either the ETSI or 3GPP (TS26.69) web sites; the zipped files contain a software application to facilitate conformance testing. The in-band modem transmitter and receiver ANSI-C reference code are bit exact, as specified in ETSI TS 126 268, and can be downloaded, including the modem code, from either the ETSI or 3GPP (TS26.268) websites. Optionally the modem receiver may be implemented a non-bit exact but must conform to the requirements specified in ETSI TS 126 268 and ETSI TS 126 269.

A useful guide to the expected performance of the in-band modem, when accessing both 2G and 3G networks and when using different speech codec, under different radio (C/I) conditions can be found in ETSI TR 126 969 “Characterisation report”.

Note that the ETSI / 3GPP in-band modem conformance tests do not test the necessary High Level Application Protocol aspects. HLAP and other eCall operational requirements, including the transferred MSD to the PSAP, are verified during the CEN specified End-to-End testing described in the next section.

5.9.4  eCall IVS, MNO, PSAP End-to-End conformance tests

It is expected that each of the major parts of the eCall service chain, IVS, Mobile Network and PSAP, will have been designed and conform to the applicable ETSI / 3GPP specifications with respect to the radio access requirements (described in section 3), the in-
band modem requirements (described in section “eCall In-Band Modem conformance tests”) and the R&TTE Directive (unwanted emissions and susceptibility).

5.9.4.1 eCall Service and Operational Requirements
The eCall service and operation requirements are specified in the following published ETSI / 3GPP Technical Specifications (TSs) and CEN European Normes (ENs):

eCall Service Requirements - ETSI specifications

ETSI TS 122 101: "Service aspects; service principles".

ETSI TS 124 008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3"

eCall Operating Requirements - CEN specifications

EN 16072 “Intelligent transport systems - eSafety - Pan European eCall - Operating requirements”

EN 16062 “Intelligent Transport Systems - eCall - High Level Application Protocols”

EN 15722 “Road transport and traffic telematics - eSafety - eCall Minimum Set of Data”

eCall Service End-to-End Conformance tests

The purpose of the CEN specified End-to-End conformance tests are to verify:

- correct operation of each individual part of the eCall service chain;
- interoperability between the major parts (IVS, MNO, PSAP) of the chain;
- reliable end-to-end eCall communication (speech and data) between the IVS and PSAP.

5.9.4.2 eCall Service End-to-End specification (CEN draft TS/EN)
The CEN TC 278 WG 15 Project Team is currently drafting the required EN to be cited in EC eCall Implementation Regulations (scheduled to come into force in 2015). Conformance to the CEN EN (draft) may be verified by testing, in accordance with the detailed tests, or by declaration that the IVS, mobile network, PSAP is in conformance with the applicable requirements.

The CEN (draft) Technical Specification is nearing completion and is expected to be sent for national comments and balloting early next year (2012), prior to being upgraded to prEN and EN status.
5.9.4.3 **IVS end-to-end conformance testing - eCall set-up**

A Manually Initiated eCall (MleC) or an Automatically Initiated eCall (AleC) is initiated in accordance with the information provided by the manufacturer.

The eCall IVS is expected to provide a call set-up MMI that enables the user to manually establish an eCall e.g. an SOS button. Additionally, an eCall IVS NAD is expected to support an interface that allows an associated eCall in-vehicle system (IVS) to automatically initiate an eCall. The emergency call set-up message sent to the network includes, in the Service Category information element, an indication that the present call is either a Manually Initiated eCall (MleC) or an Automatically Initiated eCall (AleC).

Please note: It is essential that the IVS NAD sets the eCall ‘flag’ correctly, and that the mobile network recognises and routes the eCall correctly to the designated PSAP (modem server), so as ensure that eCalls don’t fail due to e.g. recorded messages or being routed to a PSAP that is not equipped to handle eCalls.

Because an eCall IVS must operate autonomously, if the vehicle occupants are incapacitated for any reason, it is also essential that the IVS is capable of making repeat dialling attempts should the initial call set-up attempt fail for any reason e.g. due to busy or congestion tones / messages, or call answer time out.

5.9.4.4 **CEN eCall End-to-end conformance tests (provisional) – eCall IVS (system under test)**

Reference: CEN EN WD 0278316: 2011 - Intelligent transport systems – eSafety - eCall end to end conformance testing

The following flow diagrams and information is derived from the CEN draft specification. This is just for information and the, yet to be published, CEN specification must only be used for system conformance testing.

**eCall service (IVS transition states) diagram – eCall ‘only’ configured IVS**

Next figure shows the state changes when an eCall or test call is initiated from an eCall ‘only’ (restricted) configured IVS. The CTP numbers shown in the circles are references to the applicable Conformance Test Procedures in the draft ‘end to end’ test specification for an eCall IVS configured for eCall ‘only’.
Figure 10: eCall service (IVS transition states) – Pan-European eCall ‘only’ configured IVS

eCall service (IVS transition state) diagram – eCall + services configured IVS

Next figure shows the state changes when an eCall or test call is initiated from an eCall + services (unrestricted) configured IVS. The Conformance Test Procedures (CTP) numbers

29/01/2013 154 Version 1.1
shown in the circles are references to the applicable Conformance Test Procedures in the draft 'end to end' test specification for an eCall IVS configured for eCall + other services.

Figure 11: eCall service (IVS transition states) – Pan-European eCall + services configured IVS
**IVS Conformance Test Procedures (CTP) for eCall ‘only’ and eCall + services**

End-to-end Conformance Test Procedures for both eCall ‘only’ (restricted) and eCall + services (unrestricted) IVS systems under test are shown in next table. The CTP references shown in the left hand column refer to the original (draft) CEN specification and are reproduced here for information only. Please note that this information may change before the final CEN specification is published.

<table>
<thead>
<tr>
<th>CTP</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.0.1</td>
<td>Conformance to ETSI TS 102 936-1 and ETSI TS 102 936-2</td>
</tr>
<tr>
<td>1.1.0.2</td>
<td>Test for conformance to valid SIM/USIM – PE eCall</td>
</tr>
<tr>
<td>1.1.0.3</td>
<td>Automatic eCall triggering does not occur when ignition OFF</td>
</tr>
<tr>
<td>1.1.1.1</td>
<td>Power on and self test</td>
</tr>
<tr>
<td>1.1.2.1</td>
<td>eCall automatically activated</td>
</tr>
<tr>
<td>1.1.2.2</td>
<td>Automatically triggered eCall in progress is not disconnected upon a new eCall trigger</td>
</tr>
<tr>
<td>1.1.3.1</td>
<td>eCall manually activated</td>
</tr>
<tr>
<td>1.1.3.2</td>
<td>Manually triggered eCall in progress is not disconnected upon a new eCall trigger</td>
</tr>
<tr>
<td>1.1.3.3</td>
<td>Manually triggered eCall in progress is not disconnected upon automatic eCall trigger</td>
</tr>
<tr>
<td>1.1.4.1</td>
<td>Test eCall activated</td>
</tr>
<tr>
<td>1.1.5.1</td>
<td>Network registration</td>
</tr>
<tr>
<td>1.1.5.2</td>
<td>Manual termination of eCall by vehicle occupants not allowed (automatically triggered eCall)</td>
</tr>
<tr>
<td>1.1.5.3</td>
<td>Manual termination of eCall by vehicle occupants not allowed (manually triggered eCall)</td>
</tr>
<tr>
<td>1.1.5.4</td>
<td>Automatically triggered eCall in progress is not disconnected when ignition is switched to OFF</td>
</tr>
<tr>
<td>1.1.5.5</td>
<td>Manually triggered eCall in progress is not disconnected when ignition is switched to OFF</td>
</tr>
<tr>
<td>1.1.5.6</td>
<td>Network registration is re-tried when network registration attempt is not successful</td>
</tr>
<tr>
<td>1.1.6.1</td>
<td>Mute IVS and vehicle audio</td>
</tr>
<tr>
<td>1.1.7.1</td>
<td>Set-up TS12 call with eCall identifier (flag) set to ‘automatic’</td>
</tr>
<tr>
<td>1.1.8.1</td>
<td>Set-up TS12 call with eCall identifier (flag) set to ‘manual’</td>
</tr>
<tr>
<td>1.1.9.1</td>
<td>Set-up TS11 call to test number</td>
</tr>
<tr>
<td>1.1.10.1</td>
<td>eCall is attempted when no networks are available (limited service condition)</td>
</tr>
<tr>
<td>1.1.10.2</td>
<td>Re-dial attempt completed within 2 minutes after eCall is dropped</td>
</tr>
<tr>
<td>1.1.10.3</td>
<td>Duration of eCall Initiation signal</td>
</tr>
<tr>
<td>1.1.11.1</td>
<td>Send MSD with indicator set to ‘Automatically Initiated eCall’ (AleC)</td>
</tr>
<tr>
<td>CTP 1.1.12.1</td>
<td>Send MSD with indicator set to ‘Manually Initiated eCall’ (MleC)</td>
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<tr>
<td>CTP 1.1.13.1</td>
<td>Send MSD with indicator set to ‘Test Call’</td>
</tr>
<tr>
<td>CTP 1.1.14.1</td>
<td>Verify MSD transfer</td>
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<tr>
<td>CTP 1.1.14.2</td>
<td>Un-mute IVS audio when AL-ACK received</td>
</tr>
<tr>
<td>CTP 1.1.15.1</td>
<td>Establish voice link to PSAP</td>
</tr>
<tr>
<td>CTP 1.1.15.2</td>
<td>MSD transfer request while eCall conversation in progress</td>
</tr>
<tr>
<td>CTP 1.1.15.3</td>
<td>TS12 call continuation when SEND MSD request not received (T5 expired)</td>
</tr>
<tr>
<td>CTP 1.1.15.4</td>
<td>TS12 call continuation when AL-ACK not received (T6 expired)</td>
</tr>
<tr>
<td>CTP 1.1.15.5</td>
<td>MSD is transferred continuously until T7 expires and IVS reconnects loudspeaker and microphone on its expiry</td>
</tr>
<tr>
<td>CTP 1.1.16.1</td>
<td>Clear down call automatically</td>
</tr>
<tr>
<td>CTP 1.1.16.2</td>
<td>IVS clears down the eCall upon T2 expiry</td>
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<tr>
<td>CTP 1.1.16.3</td>
<td>IVS registers recent eCalls</td>
</tr>
<tr>
<td>CTP 1.1.17.1</td>
<td>Call-back allowed by IVS</td>
</tr>
<tr>
<td>CTP 1.1.17.2</td>
<td>Call-back answered by IVS</td>
</tr>
<tr>
<td>CTP 1.1.17.3</td>
<td>MSD transfer occurs upon PSAP request during call-back</td>
</tr>
<tr>
<td>CTP 1.1.17.4</td>
<td>Remain registered for ≥1 hr</td>
</tr>
</tbody>
</table>

**Table 4: Conformance tests for both eCall ‘only’ and eCall + services configured IVS**

**Additional IVS Conformance Test Procedures (CTP) for eCall ‘only’ service**

Additional End-to-end Conformance Test Procedures for eCall ‘only’ (restricted) IVS systems under test are shown in table 2. The CTP references shown in the left hand column refer to the original (draft) CEN specification and are reproduced here as a guide.

| CTP 1.1.1.2 | IVS does not perform registration after power-up – PE eCall only IVS |
| CTP 1.1.1.3 | IVS periodically scans and maintains a list of available PLMNs – PE eCall only |
| CTP 1.1.1.4 | IVS NAD rejects request for outgoing call – PE eCall only IVS |
| CTP1.1.10.4 | Verify that PLMN registration procedure is executed upon initiating an eCall – PE eCall only IVS |
| CTP 1.1.17.1 | Remain registered for ≥1 hr ≤12 hr – PE eCall only IVS |

**Table 5: Additional conformance tests for eCall ‘only’ configured IVS**
# 6 Annex B: Summary of eCall emergency service specifications

## B.1 Summary of ETSI / 3GPP eCall service referenced specifications

<table>
<thead>
<tr>
<th>eCall Service Requirements</th>
<th>3GPP TS 22.101</th>
<th>ETSI TS 122 101</th>
<th>Technical Specification Group Services and System Aspects Service aspects; Service principles (Release 9)</th>
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<tr>
<td>eCall Identifier (flag)</td>
<td>3GPP TS 24.008</td>
<td>ETSI TS 124 008</td>
<td>Technical Specification Group Core Network and Terminals; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 (Release 8)</td>
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<td>eCall Data Transfer – In band modem General Description</td>
<td>3GPP TS 26.267</td>
<td>ETSI TS 126 267</td>
<td>Technical Specification Group Services and System Aspects; eCall Data Transfer; In-band modem solution; General description (Release 8)</td>
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<td>eCall Data Transfer – In band modem ANSI-C Reference Code</td>
<td>3GPP TS 26.268</td>
<td>ETSI TS 126 268</td>
<td>Technical Specification Group Services and System Aspects; eCall Data Transfer; In-band modem solution; ANSI-C reference code (Release 8)</td>
</tr>
<tr>
<td>eCall Data Transfer – In band modem Conformance Testing</td>
<td>3GPP TS 26.269</td>
<td>ETSI TS 126 269</td>
<td>Technical Specification Group Services and System Aspects; eCall Data Transfer; In-band modem solution; Conformance testing (Release 8)</td>
</tr>
<tr>
<td>eCall Data Transfer – In band modem Characterisation Report</td>
<td>3GPP TS 26.969</td>
<td>ETSI TS 126 969</td>
<td>Technical Specification Group Services and System Aspects; eCall Data Transfer; In-band modem solution; Characterisation Report (Release 8)</td>
</tr>
<tr>
<td>eCall Network Access</td>
<td>ETSI TS 102 936-1</td>
<td>eCall Network Access Device (NAD)</td>
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<tr>
<td>Device (NAD); Protocol test specification - Part 1 Protocol test specification</td>
<td>conformance specification; Part 1: Protocol test specification</td>
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<td>---</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>eCall Network Access Device (NAD); Protocol test specification - Part 2 Test Suites</td>
<td>ETSI TS 102 936-2 eCall Network Access Device (NAD) conformance specification; Part 2: Test Suites</td>
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<tr>
<td>Guidelines on applicability of GSM and UMTS mobile station harmonised standards to eCall Network Access Device (NAD)</td>
<td>Guidelines on applicability of GSM and UMTS mobile station harmonised standards to eCall Network Access Device</td>
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<tr>
<td>Detailed Radio Access Conformance tests – including specific tests for eCall (UMTS)</td>
<td>ETSI TR 102 937 User Equipment (UE) conformance specification; Part 1: Protocol conformance specification</td>
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<tr>
<td>Detailed Radio Access Conformance tests – including specific tests for eCall (GSM)</td>
<td>3GPP TS 34.123-1 ETSI TS 134 123 User Equipment (UE) conformance specification; Part 1: Protocol conformance specification</td>
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<tr>
<td>Harmonised standard (EN) that specifies the essential UMTS (3G) requirements of the R&amp;TTE Directive for User Equipment (eCall NAD)</td>
<td>ETSI EN 301 908-1 Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 1: Harmonized EN for IMT-2000, introduction and common requirements, covering the essential requirements of article 3.2 of the R&amp;TTE Directive</td>
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<tr>
<td>Harmonised standard (EN) that specifies the essential GSM (2G) requirements of the R&amp;TTE Directive for User Equipment (eCall NAD)</td>
<td>ETSI EN 301 511 Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&amp;TTE directive (1999/5/EC)</td>
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</table>
Characteristics of the Universal Subscriber Identity Module (USIM) application - (Emergency call short codes and service category settings that can be used for eCall (emergency call) set-up)  | 3GPP TS31.102 ETSI TS 131 102  | Characteristics of the Universal Subscriber Identity Module (USIM) application

AT command set for User Equipment (UE) – (Contains optional AT+CECALL commands that may be used to initiate eCall and test call set-up)  | 3GPP TS 27.007 ETSI TS 127 007  | AT command set for User Equipment (UE)

B.2 Summary of CEN eCall service referenced specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Reference</th>
<th>Description</th>
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<tr>
<td>eCall End-to-end Conformance Test Procedures (CTP)</td>
<td>CEN (draft) EN WD 0278316: 2011</td>
<td>Intelligent transport systems - eSafety - eCall end to end conformance testing</td>
</tr>
<tr>
<td>eCall Minimum Set of Data (MSD)</td>
<td>CEN EN 15722</td>
<td>Road transport and traffic telematics - eSafety - eCall Minimum Set of Data</td>
</tr>
<tr>
<td>Pan European eCall Operating Requirements</td>
<td>CEN EN 16072</td>
<td>Intelligent transport systems - eSafety - Pan European eCall - Operating requirements</td>
</tr>
<tr>
<td>High Level Application Protocols</td>
<td>CEN EN 16062</td>
<td>Intelligent Transport Systems - eCall - High Level Application Protocols</td>
</tr>
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