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| ETSI_logo_Office_Colour_Small | ***ToR STF CD (SC EMTEL)*** |
| Version: 0.4 |
| Author: Sebastian Müller – Date: 12 Sep 2017 |
| Last updated by: ETSI Secretariat Date:19 Dec 2017 |
| page 1 of |

Terms of Reference - Specialist Task Force STF CD  
(SC EMTEL) “NG112 Conformance Test Specifications”

**Summary information**

|  |  |
| --- | --- |
| Approval status | To be approved by SC EMTEL & Board#115 |
| Funding | **Maximum budget: 57 000 € from ETSI FWP** |
| Time scale | April 2018 to Jun 2019 |
| Work Items | See §6.2 (deliverables to be produced) |
| Board priority | Standards enablers/facilitators (e.g. conformance test/interoperability/methodology)  Recommendations: use of TTCN and CTI supervision |

Part I – Reason for proposing the STF

# Rationale

ETSI, in partnership with EENA (the European Emergency Number Association), organized a first NG (Next Generation) Emergency Services Plugtests™ event in 2016 and a second Plugtests™ event in 2017. This second event was hosted by ETSI, from 6 to 10 March 2017 in Sophia Antipolis, France.

The aim of the event was to trial independently and jointly all components of the 112 communication chain based on Next Generation networks. Different topics were addressed, including Location Based Emergency Call Routing, Policy Based Emergency Call Routing, and Next Generation Media Types.

15 organizations from around the world, including Asia, Europe, and North America, had the opportunity to connect their equipment to the test infrastructure and validate the interoperability and conformity of their market solutions using different scenarios and test cases on-site from the ETSI headquarters in Sophia-Antipolis, France, as well as from their own labs. In fact, for the first time, specific remote-only testing sessions involving a US-based organization were carried out.

While the 2016 event edition focused on voice and geo-localization solutions, the 2017 scope was extended to content-rich emergency calling, such as video calling and TOTAL conversation. Participants put their products to the test, gaining valuable insights from experiencing a variety of scenarios. Tested technologies included Advanced Mobile Location as well as PEMEA (the Pan-European Mobile Emergency Application).

To complement the test activities in 2018/2019 and to provide a basis for future certification activates, this present document proposes the creation of a new STF in order to provide the necessary conformance test specifications.

# Objective

The objective of this present STF proposal is to:

* The following interfaces shall be covered
  + LIS interface via HELD or SIP
  + ECRF interface via LOST
  + PSAP interface via SIP
  + ESRP interface via SIP
* Systems Under Test (SUTs)
  + LIS
  + ECRF
  + ESRP
  + PSAP
* Collect Test requirements and define the Protocol Implementation Conformance Statement (PICS)
* Define Test Suite Structure and Test Purposes (TSS&TP)
* Develop Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT) and to compile on Titan, Elvior and Spirent test tools
* Develop a NG112 plugin for the ETSI Codec and Adapter Test Framework
* Validate the test suite before and during the next NG112 PlugtestsTM event

# Relation with ETSI strategy and priorities

The STF will contribute to the following ETSI Strategy:

* keep ETSI effective, efficient and recognised as such
* create high quality standards for global use and with low time-to-market
* establish leadership in key areas impacting members' future activities

This request is in following the priority category:

* Standards enablers/facilitators (conformance testing, interoperability, methodology)

# Context of the proposal

## ETSI Members support

The following members support this proposal:

|  |  |  |
| --- | --- | --- |
| **ETSI Member** | **Supporting delegate** | **Motivation** |
| NMHH | Balás Miklós Árpád | In the name of National Media and Infocommunications Authority of Hungary I inform you that our Authority supports the ToR and the 2 NWIs on NG112 conformance test specifications. The Hungarian governmental organizations wish to implement the results of NG112. We think it is important to have Europe-wide common solutions in this field, and the proposed work will be step towards this direction. |
| Swisscom | Beat Egger | From the experience on NG112 Plugtests™ we believe NG112 conformance testing mechanism will be really useful to guarantee a common view of the different interfaces.  The company Intersys has already developed a PoC (Proof of concept) of the standards ES 203 178 and TS 103 478 on behalf of Swisscom AG a year ago.  The developed test environment and interface components could be very useful and speed up the process.  Swisscom AG (ETSI member) in collaboration with Intersys supports the ToR and the 2 NWIs. |
| EENA | Cristina Lumbreras | Next generation 112 communications have been a priority for the European Emergency Number Association (EENA) in the last years. We have worked on the creation and promotion of NG112. We support the present ToR and the 2 work items as we think they are important next steps for testing NG112 products. |
| University of the Basque Country | Fidel Liberal Malaina | From the experience on NG112 Plugtests™ we believe NG112 conformance testing mechanism will be really useful to guarantee a common view of the different interfaces.  So, as University of the Basque Country (ETSI member) we support the included two NWIs with the attached ToR. |

## Market impact

Emergency Communication in Europe is very much linked to the European emergency number ‘112’. Calls to ‘112’ are widely known to reach out for help in case of an emergency by the telephone. Not only just since the number’s inception in 1991, citizens have been used to the telephone being the single communication channel available.

On the other hand, the world of communication has become a lot richer over the past two decades, with wide the adoption of mobile phones, of the internet, and last but not least with the combination of both in what we call ‘smartphone’, revolutionizing communication in everyday life since then, with no end becoming visible as of now.

In emergency communication the massive adoption of mobile phones led to a constantly growing challenge that was not visible in 1991: precise knowledge of the caller’s location is mandatory in order to dispatch response teams in time and effectively, and to route the calls to the right emergency response centre; and with probably an average of 70% of all emergency calls being mobile-originated the knowledge of the caller’s location turns out to be the most difficult part. Whilst citizens are able to use their smartphones for peer-to-peer communication and share their location with the precision of satellite navigation with their family, friends and for business purposes, public safety still widely is lacking access to precise location data.

However ‘location awareness’ is not only a challenge for mobile originated emergency calls. With the constant move from traditional telephone communication based on ISDN (which was the prevalent technology in 1991) to real time communication leveraging internet technology, the mechanisms used to locate a “fixed line calls” start to fall apart. Network operators have migrated their voice networks to Voice over IP with SIP signalling and are pushing this technology now to the last mile to connect fixed line phones and private business communication systems. Locating an emergency call originated from a “fixed line” phone is what operators as well as emergency response organisations have optimized their technologies and procedures for, but with the advent of SIP to connect phones and telephone systems the “location fixed” character disappears, the former fixed line phone becomes a roaming and highly mobile device.

New players in the arena of service providers have appeared, offering voice communication as well over the top of Internet data services. Adoption rates of these re-invented or new services within businesses as well as amongst the general citizens are significant. On the other hand, emergency calling through these services is still very limited, if not impossible. But still people consider these services are “phone services”. Especially ‘digital natives’ who live in an always-on and always-connected world very often do no longer differentiate what kind of phone service they use, as this could change as well shortly with a new ‘favourite app’ appearing on the market.

Besides “caller location”, the other main challenge for emergency services is on the use of access through other media than voice communication. Citizens use visual-oriented communication like text and video on a daily basis. Messaging services built into social media channels attract new users daily, and the service experience is close to real time. In addition, visual oriented services have the potential to offer equal access to emergency services for citizens with difficulties in hearing or speaking, being widely limited to fax as a channel to communicate with emergency services today.

Beyond that, visual communication channels would immediate allow to include information like a picture taken from the incident to increase situational awareness, leading to faster and better decision making.

Many emergency response organisations are aware of these challenges and started to add ‘out-of-protocol’ solutions to enhance their capabilities of managing incidents and situations, e.g. by using individual smartphones with applications like WhatsApp in order to determine the location of an emergency call. These approaches very often lead to unwanted side effects like the need to drop a 112 call and making a call to a private phone number, which is disconnected from any defined procedures and should be avoided under a service quality aspect.

Considering the significant challenges in current emergency communications, there is a strong need to translate the 112 and other emergency phone services into an adequate format with state-of-the-art capabilities. Standards are being created to solve these challenges, technologies are available and ready to be adopted. The emergency communication chain end-to-end has to be digitally transformed in order to meet the needs and the expectations.

Providing test specifications to support this technology change is essential.

## Tasks for which the STF support is necessary

Experience with the development of other standards has shown that involvement of experts on conformance and interoperability testing of protocols requires highly specialised knowledge in testing methodology. The generation of test specifications requires significant concentrated effort that can only be done by service contractors’ experts on a funded basis. Hence, the involvement of testing experts is needed in order to assure timely completion and high quality deliverables. The service contractors’ experts will use dedicated software tools available at ETSI. Test adapter development and test suite validation are expert tasks, which cannot be provided by a TB.

## Related voluntary activities in the TB

* Delegates within the TB will review the deliverables

## Outcome from previous funded activities in the same domain

N/A

## Consequences if not agreed

NG112 equipment is currently being deployed in experimental trials with the progression towards fully operational deployment. Thorough conformance testing will increase the level of confidence that equipment from various suppliers will interoperate. This in turn will reduce implementation and rollout times. Not providing timely validated and reliable test specifications, would ultimately delay the deployment of NG112 services.

Part II - Execution of the work

# Technical Bodies and other stakeholders

## Reference TB

SC EMTEL

## Other interested ETSI Technical Bodies

N/A

## Other stakeholders

The European Emergency Number Association (EENA) is a non-governmental organisation based in Brussels, Belgium, with the mission to contribute to improving the functioning of emergency services for citizens.

EENA published in 2013 the Next Generation 112 long term definition (‘NG112 LTD’). To ensure global interoperability, EENA cooperated strongly with organisations all over the world. Together with ETSI, EENA co-organised the NG112 Communications Plugtests™ Events and has been working on the development and dissemination of NG112.

Test specification for this technology would suppose a crucial next step to ensure standardised and interoperable emergency services technologies.

The European Industry that provides solutions for public safety answering points and NG112 Plugtests™ will benefit from the available conformance tests. This will allow future certification which is an important element to deployment.

# Base documents and deliverables

## Base documents

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* ETSI FORGE  
  <http://www.ttcn-3.org/index.php/development/devlibraries/devlib-libims>
* ETSI ES 203 283 Protocol specifications for Emergency Service Caller Location determination and transport
* ETSI ES 203 178 Functional architecture to support European requirements on emergency caller location determination and transport
* ETSI TR 103 480 Interoperability testing of core elements for network independent access to emergency services
* ETSI TS 103 479 Core elements for network independent access to emergency services

## Deliverables to be produced

|  |  |  |
| --- | --- | --- |
| **Deliv.** | **Work Item code**  **Standard numb.** | **Working title**  **Scope** |
| D1 | DTS/EMTEL-0042 | Emergency Communications (EMTEL); Testing; - Conformance test specifications for **NG112**; Part 1: Protocol Implementation Conformance Statement (PICS) pro forma and Test Suite Structure and Test Purposes (TSS&TP) |
| D2 | DTS/EMTEL-0043 | Emergency Communications (EMTEL); Testing; - Conformance test specifications for **NG112**; Part 2: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT) |

## Deliverables schedule:

* Start of work Apr-2018
* ToC and scope May-2018
* Early draft Jun-2018, EMTEL#42
* Stable draft Oct-2018, EMTEL#43
* Final draft May 2019
* TB approval May 2019, RC
* Publication Jun-2019

# Work plan, time scale and resources

## Task description

Task T1: Project Management (ETSI/CTI)

* Attending Technical Body and WG meetings
* Coordination, communication, reporting and leading of activities
* The STF Leader will prepare the Final Report.

Task T2: PICS and TSS&TP development

Extraction of testable requirements. Production of the PICS and TSS&TP document. PICS and TSS&TP will be delivered in a single document. This task can be executed remotely, however at least a kick-off meeting at ETSI HQ is preferred.

Task T3: Test Suite Development

Development of the test suite in TTCN-3. The test scripts shall be able to be compiled with Elvior, Titan and Spirent tools. This task shall review the deliverables of Task T2. This task shall be executed in work sessions at ETSI HQ.

**Task T4: Codec and TA plugin development**

The Codec and TA software shall be delivered as source code including all source code modules needed for the compilation into an executable version of the software. All software shall be accessible from <https://forge.etsi.org> . This task shall be executed in work sessions at ETSI HQ.

**Task T5: Test Suite Validation**

The following SUTs shall be validated: LIS, ECRF, ESRP and PSAP. In case a NG112 Plugtests™ event is held during the present STF is active then part of the Test Suite Validation shall be performed at the event. The Plugtests™ event is planned to be held at ETSI HQ.

Task T6: Provide support to the SC EMTEL approval process

**T6.1 – Review of stable drafts**

Before reaching the status of stable draft, the STF will submit the draft deliverables to editHelp for clean-up. The STF will then present the stable drafts to SC EMTEL for comments and to the ETSI Secretariat for pre-processing.

T6.2 - Inclusion of comments from stable draft review

The STF will include the comments received from the stable draft review (technical as well as editHelp! clean-up) and produce the final drafts of the deliverables for SC EMTEL approval.

## Task summary & Milestones

|  |  |  |  |
| --- | --- | --- | --- |
| **N** | **Task / Milestone / Deliverable** | Target date | Estimated cost |
| M0 | Start of work | Apr 2018 |  |
| T1 | Project management, reporting, meeting attendance | 18 Apr 2018 – Jun 2019 |  |
| T2 | PICS and TSS&TP development | 18 Apr – 24 Oct 2018 | 21 000 |
| T3 | Test Suite Development | 14 May – 24 Oct 2018 | 18 000 |
| M1 | Early draft of PICS, TSS&TP and TTCN,  Progress report approved (SC EMTEL#42) | 21-Jun-2018 |  |
| M2 | Stable draft of PICS and TSS&TP and TTCN, Progress report approved (SC EMTEL#43) | 24 Oct 2018 |  |
| T4 | Codec and TA plugin development | 14 May – 24 Oct 2018 | 6 000 |
| M3 | Codec and TA plugin available on <https://forge.etsi.org> and accepted by the ETSI Secretariat/CTI | 24 Oct 2018 |  |
| T5 | Test Suite validation | Oct 2018 - Mar 2019 | 12 000 |
| M4 | Test Suite validated and accepted by the ETSI Secretariat/CTI | Mar 2019 |  |
| M5 | Deliverables and STF Final Report approved by SC EMTEL | May 2019 |  |
| M6 | Deliverables accepted by the ETSI Secretariat (ready for publication) | Jun 2019 |  |
| **Total** | | | **57 000** |

# Expertise required

Two to three contractors to ensure the following mix of skills:

* expert knowledge of all base standards mentioned above in clause 6.1; especially HELD, LoST, SIP Emergency Calls
* expert knowledge of TTCN-3 (ES 201 873);
* expert knowledge in conformance testing;
* expert knowledge in codec and adaptation layer development in C++/Java.

Part III: Financial conditions

# Maximum budget

## Contractors cost

Maximum budget **57 000 €**

## Travel Costs

N/A. Any required travel to present the progress or results of the work will be covered by ETSI/CTI.

## Other Costs

N/A

# Part IV: STF performance evaluation criteria

# Key Performance Indicators

* Quality of deliverables
  + Approval of deliverables from the Reference TB according to schedule
  + Deliverables approved by SC EMTEL accepted by the ETSI Secretariat for publication
  + Respect of time scale, with reference to start/end dates in the approved ToR

In the course of the activity, the STF Leader will collect the relevant information, as necessary to measure the performance indicators. The result will be presented in the Final Report.

# Document history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.1 | 12-Sep-2017 | Sebastian Müller | First draft |  |
| 0.2 | 20-Sep-2017 | Sebastian Müller | Second draft | Member support added |
| 0.3 | 06-Oct-2017 | ETSI Secretariat | Third draft | For OCG/Board |
| 0.4 | 19-Dec-2017 | ETSI Secretariat | Board#115 approved | Revision before CL Publication |