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| --- |
| ToR STF 623 (Ref. Body EMTEL) |
| Version: 0.4 |
| Author: TC EMTEL – Date: 2021-06-02 |
| Last updated by: ETSI Secretariat – Date: 2021-11-26 |
| page 1 of 11 |

**Terms of Reference –Specialist Task Force Proposal**

**STF 623(TC EMTEL)**

**Update of Emergency Communications Network Resilience and Preparedness guidelines**

Summary information

|  |  |  |
| --- | --- | --- |
| Approval status | Approved by Ref. Body TC EMTEL (doc ref: EMTEL(21)000017r1)  | **YES** |
| Approved by Board#134a (15 November 2021) | **YES** |
| Reference Body | TC EMTEL |
| ETSI Funding | **Maximum budget : 65 600 EUR** |
| Minimum of 4 ETSI Members Support | **YES** |
| Time scale | **From** | 2022-02-07 |
| **To** | 2023-03-31 |
| Work Items  | RTR/EMTEL-0061 approved on 14 June 2021 |
| Board priority | [ETSI STF funding criteria](https://portal.etsi.org/STF/STFs/Funding/ETSIbudget.aspx)

|  |  |
| --- | --- |
| **Priority Criteria** | **X** |
| Maintenance of standards in mature domains |  |
| Innovation in mature domains | X |
| Emerging domains for ETSI |  |
| Horizontal activities (quality, security, etc.) |  |
| Societal good / environmental | X |

 |

Part I – STF Technical Proposal

# Rationale & Objectives

## Rationale

The unexpected events and disasters that occurred since the start of the 21st century demonstrated that being able to communicate in emergency situations allows to alleviate the number of injuries and fatalities brought by these events. Even in more normal situations, anyone may need calling an emergency number so asking for help remains crucial (see also articles 108, 109 and 110 of the European Electronic Communications Code [1]).

Emergency communications rely on fixed and wireless networks, systems architectures, etc. provided by network and voice / data communications service providers, whether they are dedicated to emergency communications or not. Their networks and services, when they target emergency communications, must be designed to resist the impact of unforeseen hazards and enable the system to return to a previous normal condition in case of failure. An example of network failure situation occurring under non-emergency situation was the event that prevented all emergency calls in France on June 2, 2021.

Dealing with this topic was the objective of the guidelines provided by ETSI TR 102 445 ("EMTEL; Overview of Emergency Communications Network Resilience and Preparedness"), linked to the TC EMTEL four main pillars when it was published in 2006. As stated in TC EMTEL Terms of Reference, these guidelines are closely related with the TC EMTEL four main pillars, which cover emergency communications:

* from individuals with public authorities/organisations,
* between authorities/organisations (including mission critical communications),
* from authorities/organisations to the individuals (including public warning),
* amongst individuals,

The published version of the Technical Report 102 445 presents network resilience concepts and considers their application within technological systems that enable emergency communications. The report in its baseline applies to all types of communication networks: mobile radio, but also to fixed lines and private networks. It provides guidelines for resilience and preparedness of emergency communication networks, as they existed in 2006, and requirements for specialized systems and capabilities, which are crucial for public safety.

A recent analysis, conducted by TC EMTEL, concluded that the communication technologies considered in this standard are mostly outdated. While many of the definitions and main concepts in the document are generic and still valid, communication means, architectures and technologies used by emergency services have strongly evolved in the past 15 years. An important point is that the scope of the report goes beyond mobile and radio networks and applies both to wireless and fixed connections. Even if 3GPP has partly addressed the topic regarding mobile networks and if 5G aims at building common resilient networks for public and professional markets, other network technologies may also be used by emergency services that need to be resilient and prepared as well. This would apply to other technologies~~,~~ as well: some SDOs and committees may have partially covered the topic, but it is not covered globally to support manufacturers and integrators designing networks for emergency services. A higher-level document covering all types of communication networks, as well as the next generation services and systems is still needed, as envisioned by EMTEL in 2006, and in line with the objectives of the Technical Committee. The document would also collect and leverage the experience and "lessons learnt" on preparedness and resilience from existing or early providers of these systems.

It is thus important to review the content of the standard to understand which are its core concepts and where outdated communication technologies should be replaced by more recent ones, analysing the different technologies used by emergency services that should be included in the report. The result of this work will enable keeping these guidelines up-to-date and usable as a reference by emergency services, as well as their network and service providers.

[1] Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code.

## Objectives of the work to be executed

The objective of the work will be to revise the Technical Report TR 102 445 to apply the defined concepts of resilience and preparedness to more recent technologies used by emergency communications and services relevant with the TC EMTEL four main pillars as cited above in section 1.1, including packets switched networks.

The list below provides an example of such technologies. The full list of technologies to be covered by the guidelines in the revised Technical Report will be the outcome of the first technical task planned in the STF (see explanations below and section 7.1).

* wireless networks, for example cellular networks deployed in Europe, virtualization, Wi-Fi;
* enhanced transmissions due to a better usage of fibres in fixed wired networks;
* new communication means including through packet switched networks, for example VoIP, VoLTE, text over LTE (Real-Time Text, RTT), video over LTE (Total conversation), messaging, over the top apps for voice and data communication, video distribution, video conferencing, etc.;
* communications with IoT devices and platforms, as studied in TR 103 582;
* the Next Generation 112 (NG 112) architecture, emergency Apps, Advanced Mobile Location,
* etc …

Due to the substantial effort with required mix of skills needed and EMTEL delegates time availability, a small STF should be established to prepare this revision which would be useful in a short time frame, as providers are currently preparing their next generation systems.

In a first step, the STF will perform a technical analysis to build a catalogue of the technologies which are relevant for inclusion in the TR, based on its existing content and latest available standards. All types of managed as well unmanaged networks and technologies, as used by emergency services presently and in future will be considered in this analysis.

In a second step, the objective is to compile and consolidate a comprehensive set of up-to-date guidelines for emergency communications preparedness and resilience. While the initial version of the TR 102 445 standard, prepared in 2006, addressed mainly preparedness and resilience of networks, this updated version will have a broader scope to cover the communications involved in the support of all types of emergency situations listed in TC EMTEL four main pillars listed above in section 1.1. Where standards covering resiliency and preparedness are already available (for example at 3GPP), the STF will reference them rather than duplicate their work. This STF should be able to deliver its results in a time scale slightly longer than one year.

## Previous funded activities in the same domain

TC EMTEL did not receive STF support on this specific topic in the last 5 years. This Technical Report was published in October 2006.

## Market impact

The concept of the Technical Report is to provide a wide range of global guidelines for resilience and preparedness of emergency communications. The concepts and analysis in this Technical Report are expected to be very useful to emergency services authorities and decision-makers when setting-up or updating the communication networks and services. Being able to communicate in emergency situations (e.g. calling an emergency number and asking for help, disseminating information to affected individuals) allows to alleviate the number of injuries and fatalities brought by unexpected events. The application of this analysis to communication networks in the published version of the report TR 102 445 is largely outdated because the document is 15 years old (prepared in 2006). A revision of these guidelines will enable the different types of communication networks used by emergency services to increase their level of resilience and preparedness in case unexpected events affect their operation.

## Consequences if not agreed

If not agreed, TR 102 445 should be withdrawn and communication networks and service providers will have to use fragmented information provided by the different SDOs, when they exist, to ensure uninterrupted access to emergency services and uninterrupted transmission of public warnings, instead of finding all relevant guidelines in a single reference document.

# Relation with ETSI strategy and priorities

Relation with the objectives of the proposed activity and the Priority Criteria and provide a rationale [BOARD(19)123\_014]:

|  |  |
| --- | --- |
| **Priority Criteria** | **Rationale** |
| Maintenance of standards in mature domains |  |
| Innovation in mature domains | YesThe STF proposes to update this critical TR taking into account the innovations, new architecture and technologies that have emerged in the emergency communications domain in the past 15 years. |
| Emerging domains for ETSI |  |
| Horizontal activities (quality, security, etc.) |  |
| Societal good / environmental | YesThis STF brings the capability to ETSI to improve European citizens' safety and prevent injuries and fatalities. |

# ETSI Members Support

|  |  |  |
| --- | --- | --- |
| **#** | **ETSI Member** | **Supporting delegate** |
| 1 | FBConsulting S.A.R.L.  | Michelle Wetterwald |
| 2 | one2many  | Peter Sanders |
| 3 | Frequentis | Wolfgang Kampichler  |
| 4 | EENA  | Cristina Lumbreras |

# Deliverables

## Base documents

|  |  |  |
| --- | --- | --- |
| **Document** | **Title** | **Status** |
| ETSI TS 102 181 | EMTEL; Requirements for communications between authorities/organizations during emergencies | Published |
| ETSI TS 102 182 | Requirements for communications from authorities/organizations to individuals, groups or the general public during emergencies | Published |
| ETSI TR 103 582 | EMTEL; Study of use cases and communications involving IoT devices in provision of emergency situations. | Published |
| ETSI TS 103 479 | EMTEL; Core elements for network independent access to emergency services. | Published |
| ETSI TS 103 755 | EMTEL; PEMEA ESInet Shared Services | Published |
| ETSI TS 103 625 | EMTEL; Transporting Handset Location to PSAPs for Emergency Calls - Advanced Mobile Location | Published |
| ETSI TS 122 179 | LTE; Mission Critical Push to Talk (MCPTT) over LTE; Stage 1 (3GPP TS 22.179). | Published |
| ETSI TS 122 280 | LTE; Mission Critical Services Common Requirements (3GPP TS 22.280) | Published |
| ETSI  | (3GPP) 5G SON, reconfigurability, virtualization, MEC | Published |
| EECC | Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code. | Published |

## New deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **Deliv.** | **Work Item code****Standard number** | **Working title****Scope** | **Expected date for publication** |
| D1 | RTR/EMTEL-0061 TR 102 445 | Working title: Emergency Communications (EMTEL); Overview of Emergency Communications Network Resilience and PreparednessScope: Revise the technical report to apply the defined concepts of resilience and preparedness to more recent communication network technologies used by emergency services | 20/02/2023 |

# Maximum budget

## Task summary/Manpower Budget

The proposed budget is correlated with the expected size of the team, where a broad range of technical skills are needed (see section 6.2).

|  |  |
| --- | --- |
| **Task short description** | Budget (EUR) |
|
| Task 1: Project management | 8 000,00 |
| Task 2: Technical analysis of more recent technologies to consider | 29 000,00 |
| Task 3: Preparation and consolidation of up-to-date guidelines | 25 000,00 |
| **TOTAL** | **62 000,00** |

## Travel budget

|  |  |
| --- | --- |
| **Expected travels** | **Cost estimate** |
| Reference TB meetings (4 travels) | 2 400 € |
| Other ETSI TB / stakeholders’ meetings (2 travels) | 1 200 € |
| **Total cost** | **3 600 €** |

## Other budget line

Not applicable

Part II – Details on STF Technical Proposal

# Tasks, Technical Bodies and other stakeholders

## Organization of the work

The technical work will be developed in 2 technical tasks covering

* Technical analysis of more recent technologies to consider,
* Preparation and consolidation of up-to-date guidelines.

These two activities will start sequentially with partial overlap as described in the STF time plan.

It is anticipated that the majority of the work will be performed as drafting work remotely and electronically. Virtual meetings will be organized periodically for project management. Furthermore, a few additional face-to-face working sessions will be organized (Covid-19 permits), especially for clarification purposes with regard to the alignment of the various information sources and coordination of the technical results. It is planned to have around two face-to-face working sessions in total.

This STF should be performed under the guidance of TC EMTEL. Other ETSI Technical bodies and external stakeholders (listed in sections 6.3 and 6.4) will be informed and consulted on the progress of the work through liaison letters.

The STF will take benefit of a Steering Committee composed by the TC EMTEL delegates and will meet with the committee during the regular TC EMTEL meetings (3 per year).

Travel cost for working sessions will be included in the contract compensation (manpower cost). Presentation of results to TC EMTEL and other TBs will be reimbursed as real cost from the travel budget in case of face-to-face sessions.

## Tasks for which the STF support is necessary

ETSI needs specific technical expertise that is not currently present or has sufficient resources within TC EMTEL. The revision will require a substantial effort with a mix of skills in mobile and wireless networks, mobile broadband, fixed transmission networks, communications with machines over wide and short-range networks, new emergency communication architectures, location update mechanisms, etc. to collect all necessary information and introduce them in a single guidelines document.

Therefore, under this proposed action, ETSI will perform the work described above with the support of an ETSI Specialist Task Force (STF).

The work of this STF will be essential to aid the drafting and preparation of the revised technical report as rapidly as possible in order to maximise the resulting benefits and to publish an effective version of the standard in a short time scale of around one year.

## Other interested ETSI Technical Bodies

This work would be interesting for other TCs involved in communication networks, such as TC ATTM, TC INT, TC SmartM2M (as well as oneM2M), ISG ENI and 3GPP SA1 and SA6. These committees will be informed of the progress of the work through liaison letters.

## Other stakeholders

Liaising with EENA for consultation would help to complement the ETSI view.

Part III: Execution of Work

# Work plan, time scale and resources

## Task description

|  |  |
| --- | --- |
| **Task #1** | ***Project Management and coordination with other organizations*** |
| **Objectives** | Provide appropriate development of the work in term of quality and timely delivery to ETSI TC EMTEL |
| **Input** | ETSI secretariat for STF management,TC EMTEL to steer, review and approve the technical work, other organizations inside / outside of ETSI, as described in section 6. |
| **Output** | STF progress reports, reports to TC EMTEL (which is also the Steering Group), management of the STF activities and priorities, quality review. |
| **Interactions** | ETSI secretariat, TC EMTEL, other groups as indicated in section 6, other relevant groups that may be identified during the development of the work. |
| **Resources required** | One expert with* STF management skills;
* Technical management skills and expertise in STF;
 |

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| **Task #2** | **Technical analysis of more recent technologies to consider** |
| **Objectives** | The objective of this task is to identify the technologies used by emergency services that need to be involved in the revision of the Technical Report. |
| **Input** | This task will take into account the standardization work already done at EMTEL and emergency communication activities in other technical bodies. It will review the documents referenced in Section 4.1 and, when possible, further input documents. It will analyse the current version of TR 102 445 as well as the most recent emergency communication network architecture. It will identify the parts which are outdated and provide a detailed list of the technologies used by emergency services, together with their main features, that need to be involved in the revision of the Technical Report.  |
| **Output** | An early draft of the TR documenting the results of the analysis of emergency network technologies  |
| **Interactions** | Steering Committee, ETSI TC EMTEL In addition, other stakeholders listed in sections 6.3 and 6.4 may be consulted to potentially receive suggestions and comments. |
| **Resources required** | Around 4 experts with a good mix of:* Skills in mobile and wireless networks, mobile broadband, fixed transmission networks
* Knowledge of emergency communication architectures and requirements
* Knowledge of communications with machines over wide and short-range networks
* Knowledge of existing specifications for emergency communications
* Experience in drafting ETSI Standards
* Experience of working in an international distributed environment.
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| **Task #3** | **Preparation and consolidation of up-to-date guidelines** |
| **Objectives** | The objective of this task is to develop the updated guidelines and recommendations for the preparedness and resilience of emergency communications networks.  |
| **Input** | Result of the technical analysis performed in Task 2. |
| **Output** | Based on the outcome of Task 2, this task will develop a holistic set of guidelines and recommendations to replace the outdated content in TR 102 445. This content will be based on the defined main concepts of resilience and preparedness already described in the current version of the TR. |
| **Interactions** | Steering Committee, ETSI TC EMTEL In addition, other stakeholders listed in sections 6.3 and 6.4 may be consulted to potentially receive suggestions and comments. |
| **Resources required** | Around 4 experts with a good mix of:* Skills in mobile and wireless networks, mobile broadband, fixed transmission networks
* Knowledge of emergency communication architectures and requirements
* Knowledge of communications with machines over wide and short-range networks
* Knowledge of existing specifications for emergency communications
* Experience in drafting ETSI Standards
* Experience of working in an international distributed environment.
 |

## Milestones

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **A** | Early draft of D1 (RTR/EMTEL-0061) with “early” content from Task 2 results and progress report approved by TC EMTEL | 2022-04-29 |
| TC EMTEL Deliverable | Early draft of D1 (RTR/EMTEL-0061) with “early” content from Task 2 results accepted by TC EMTEL |
| ETSI Deliverable | Progress Report#1 approved by TC EMTEL |

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| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **B** | Early draft of D1 (RTR/EMTEL-0061) with stable content from Task 2 results and progress report approved by TC EMTEL | 2022-07-29 |
| TC EMTEL Deliverable | Early draft of D1 (RTR/EMTEL-0061) with stable content from Task 2 results accepted by TC EMTEL |
| ETSI Deliverable | Progress Report approved by TC EMTEL |

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| **Milestone** | **Description** | **Cut-Off Date** |
| **C** | Stable draft of D1 (RTR/EMTEL-0061) with final content from Task 2 results and stable content from Task 3 results, and progress report approved by TC EMTEL | 2022-11-30 |
| TC EMTEL Deliverable | Stable draft of D1 (RTR/EMTEL-0061) with final content from Task 2 results and stable content from Task 3 results accepted by TC EMTEL |
| ETSI Deliverable | Progress Report approved by TC EMTEL |

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| **Milestone** | Description | Cut-Off Date |
| **D** | Final draft of D1 (RTR/EMTEL-0061) and final report approved by TC EMTEL. | 2023-02-28 |
| TC EMTEL Deliverable | Final draft of D1 (RTR/EMTEL-0061) approved by TC EMTEL |
| ETSI Deliverable | Final Report approved by TC EMTEL |

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| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **E** | Deliverables published, STF closed | 2023-03-31 |
| TC EMTEL Deliverable | Deliverable D1 (RTR/EMTEL-0061) published. |
| ETSI Deliverable | STF closed |

## Task summary

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | **Task / Milestone**  | Target Date | Estimated Cost (EUR) |
| From | To |
|  | Start of work | 07/02/22 |  |  |
| T1 | Project management | 07/02/22 | 31/03/23 | 8 000,00 |
| T2 | Technical analysis of more recent technologies to consider | 07/02/22 | 30/11/22 | 29 000,00 |
| Milestone A | Early draft of D1 (RTR/EMTEL-0061) with early content from task 2 result.Progress report#1 approved by TC EMTEL |  | 29/04/2022 |  |
| Milestone B | Early draft of D1 (RTR/EMTEL-0061) with stable content from task 2 result.Progress report#2 approved by TC EMTEL |  | 29/07/22 |  |
| T3 | Preparation and consolidation of up-to-date guidelines | 01/08/22 | 31/03/23 | 25 000,00 |
| Milestone C | Stable draft of D1 (RTR/EMTEL-0061) with final content from Task 2 results and stable content from Task 3 results.Progress report#3 approved by TC EMTEL |  | 30/11/22 |  |
| Milestone D | Final draft of D1 (RTR/EMTEL-0061) and final report approved by TC EMTEL. |  | 28/02/23 |  |
| MilestoneE | Deliverables published, STF closed |  | 31/03/23 |  |
|  | **62 000,00** |

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| **Task/ Mil.** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** |
| T1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MA |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |
| MB |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |
| MC |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |
| MD |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |
| ME |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |

# Expertise required

## Team structure

The STF will consist of experts, which must be prepared to work in close cooperation to share the tasks under the guidance of the Steering Committee (which is composed by the TC EMTEL delegates).

One of the providers will act as STF Leader and will be responsible for the consolidation of the documentation, coordination of the STF activities and the provision of the required progress reports to TC EMTEL that is also the Steering Committee of this STF.

The STF Leader as well as other providers must be able to perform the specific tasks defined in Section 7.1.

The participation of (up to) 4 providers is envisaged to ensure the necessary mix of competences:

|  |  |
| --- | --- |
| **Priority** | **Qualifications and competences** |
| High | Skills in mobile and wireless networks, mobile broadband, fixed transmission networks |
| High | Knowledge of emergency communication architectures and requirements |
| High | Knowledge of communications with machines over wide and short-range networks |
| Medium | Knowledge of existing specifications for emergency communications |
| High | Experience in drafting ETSI Standards |
| Medium | Experience of working in an international distributed environment |
| Medium | Organizational skills, strong writing and reporting skills, creativity and capacity to work in a team, and commitment to deliver |

Part IV: STF performance evaluation criteria

# Performance Indicators

|  |
| --- |
| **Select relevant Performance indicators applicable for these ToR (X)** |
| **Contribution from ETSI Members to STF work** |
| Direct financial contribution (co-funding) |  |
| Support to the STF work (e.g., provision of test–beds, organization of workshops, events) |  |
| Steering Group meetings (number of meetings / participants / duration) | X |
| Number of delegates directly involved in the review of the deliverables | X |
| Contributions/comments received from the reference Reference Bodies | X |
| Contributions/comments received from other Reference Bodies | X |
|  |  |
| **Contribution from the STF to ETSI work** |
| Contributions to Reference Body meetings (number of documents / meetings / participants) | X |
| Contributions to other Reference Bodies |  |
| Presentations in workshops, conferences, stakeholder meetings | X |
|  |  |
| **Liaison with other stakeholders** |
| Stakeholder participation in the project (category, business area) |  |
| Cooperation with other standardization bodies |  |
| Potential interest of new members to join ETSI |  |
| Liaison to identify requirements and raise awareness on ETSI deliverables  | X |
| Comments received on drafts (e.g. on WEB site, mailing lists, etc.) | X |
|  |  |
| **Quality of deliverables** |
| Approval of deliverables according to schedule | X |
| Respect of time scale, with reference to start/end dates in the approved ToR | X |
| Comments from Quality review by Reference Body | X |
| Comments from Quality review by ETSI Secretariat | X |
|  |  |

Time recording

For reporting purposes, the STF experts shall fill in the time sheet provided by ETSI with the days spent for the performance of the services

During the activity, the STF Leader shall 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 | 2021-06-02 | TC EMTEL | TC EMTEL Approved |  |
| 0.2 | 2021-06-25 | ETSI Secretariat | Draft | Updates before Board submission |
| 0.3 | 2021-09-06 | ETSI Secretariat | TC EMTEL Approved | Update with doc ref of the TC EMTEL approval before Board#134 submission |
| 0.4 | 2021-11-26 | ETSI Secretariat | Board 134a Approved | Update before CL publication |