ETSI Plugtests Report V1.0.1 (2025-07)

TECHNICAL REPORT

Next Generation eCall Plugtests 2025
10 - 13 June 2025
Bonn, Germany

Co-funded by the European Union

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1 Executive Summary

The Next Generation eCall Plugtests 2025 were held from 10 to 13 June 2025 in Bonn, Germany.

This event was organized by ETSI with the support of the European Commission, European Free Trade Association and EENA and was hosted by Deutsche Telekom.

The NG eCall Plugtests 2025 event had a specific focus on the interoperability of Next Generation eCall (NG eCall) over Long Term Evolution (LTE), based on the interoperability tests described in ETSI TS 103 683 [6].

The vendors of In-Vehicle Systems (IVS) and Public Safety Answering Points (PSAP), supporting the Next Generation eCall, joined the event. While carrying out interoperability tests, participants had the opportunity to test multiple aspects of their NG eCall implementations.

The aim of the event was to allow the interoperability testing for advanced NG eCall scenarios, giving the priority to provide real, commercially deployed infrastructure from multiple European MNOs, especially commercial 4G networks. It helps to enrich the testing by bringing real use case scenarios and move on to the next steps for vendors to deploy the next generation of a European eCall architecture.

Tests were executed in the network environment, provided by Deutsche Telekom, with the support of two other MNOs: Telefonica and Vodafone.

The event also included conformance test infrastructure, provided by multiple conformance test tool vendors.

The test results were reported by vendors using the ETSI Test Reporting Tool (TRT), allowing assessing the level of interoperability either by test categories or across all vendors.

The event provided value for standardisation with the final debriefing session where experts could address technical questions and interoperability issues.

As a result of the event, some comments for a ETSI TS 103 683 [6] update clarification have been proposed (see clause 8.3) and an Implementation guidance has been provided (see clause 9).

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long-term validity.

The following referenced documents are necessary for the application of the present document.

[1] IETF RFC 8147: “Next-Generation Pan-European eCall”

[2] EN 15722:2020: “Road transport and traffic telematics – eSafety – eCall Minimum Set of Data”

[3] EN 17184:2024: “Intelligent transport systems – eSafety – eCall High level application Protocols (HLAP) using IMS packet switched networks”

[4] ETSI TS 123 167 (Rel-14): “IP Multimedia Subsystem (IMS) emergency sessions”

[5] ETSI TS 124 229 (Rel-14): “IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3”

[6] ETSI TS 103 683: “Mobile Standards Group (MSG); Testing; Next Generation eCall High Level Application Protocol (HLAP) Interoperability Testing”

[7] EN 17240:2024: “Intelligent transport systems – eSafety – ECall end to end conformance testing for IMS packet switched based systems”

[8] FprEN 18052:2025: “Intelligent transport systems – eSafety – ECall end to end conformance testing for eCall HLAP in hybrid circuit switched/packet switched network environments”

[9] ITU-T P.1140: “Speech communication requirements for emergency calls originating from vehicles”

[10] 3GPP TS 24.229 (Rel-19): “IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3”

[11] EN 16072:2025: “Intelligent transport systems – ESafety – Pan-European eCall operating requirements”

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long-term validity.

The following referenced documents are not necessary for the application of the present document, but they assist the user with regard to a particular subject area.

[i.1] ETSI ETR 266: “Methods for Testing and Specification (MTS); Test Purpose style guide”

[i.2] CEN Liaison Statement: “LS on Next Generation eCall”

Accessible at: https://www.3gpp.org/ftp/TSG_SA/TSG_SA/TSGS_104_Shanghai_2024-06/Docs/SP-240522.zip

3 Abbreviations

ACK	Acknowledgement
DNS	Domain Name Server
EPC	Evolved Packet Core
GSM	Global System of Mobile Communications
HLAP	High Level Application Protocol
IMS	IP Multimedia Subsystem
IVS	In-Vehicle System

NOTE: eCall terminal and associated sub-systems in vehicle.

MNO	Mobile Network Operator
MSC	Mobile Switching Centre
MSD	Minimum Set of Data
NA	Test is Not Applicable
NAD	Network Access Device
NG	Next Generation
NO	Test is recorded as NOT successfully passed
OK	Test is recorded as successfully passed
OT	Test is recorded as not being executed due to lack of time
PBX	Private Branch Exchange
PLMN	Public Land Mobile Network
PSAP	Public Safety Answering Point
SBC	Session Border Controller
SIM	Subscriber Identity Module
SIP	Session Initiation Protocol
TRT	Test Reporting Tool
URN	Unique Resource Name
USIM	Universal Subscriber Identity Module
VPN	Virtual Private Network

4 Host

The event was co-funded by European Commission and EFTA with the partnership of European Emergency Number Association.

This event was hosted by Deutsche Telekom.

5 Participants

This section contains lists of participating companies and observing organizations.

Table 1: List of participating vendors

1	Company	Country
2	Anritsu Corporation.	JP
3	Audi AG	DE
4	Bayerische Motoren Werke AG	DE
5	CESTEL	ES
6	cetecom advanced GmbH	DE
7	CreaLog Software-Entwicklung u	DE
8	Continental Automotive Romania	RO
9	Continental Automotive France	FR
10	DATUS AG	DE
11	Denso Ten Limited	JP
12	DENSO Automotive UK Ltd.	UK
13	Deutsche Telekom AG	DE
14	eurofunk Kappacher GmbH	AT
15	Ford Motor Company	US
16	Frequentis AG	AT
17	Harman Becker Automotive Systems GmbH	DE
18	HEAD acoustics GmbH	DE
19	Honda Motor Co., Ltd	JP
20	HxGN Safety & Infrastructure GmbH	DE
21	IAV GmbH	DE
22	Intersys AG	CH
23	Italdesign-Giugiaro S.p.A	IT
24	Jaguar Land Rover	GB,HU,IN
25	Keysight Technologies UK Ltd	GB
26	Kontron Europe GmbH	DE
27	LG Electronics Inc.	KR
28	LG Innotek	KR
29	Mercedes-Benz AG	DE
30	Mobileum Inc	US
31	Hyundai Mobis	KR,DE
32	OECON Products & Services GmbH	DE
33	Omda Emergency AB	SE
34	Qualcomm Germany GmbH	DE
35	ROHDE & SCHWARZ GmbH & Co.KG	DE
36	Shanghai Changxing Software.,Ltd.	CN
37	Shanghai DS Information Tech.	CN
38	Telefónica Germany GmbH & Co OHG	DE
39	TE-SYSTEMS GmbH	DE
40	TOYOTA Info Technology Center USA, Inc.	US
41	Valeo Telematik und Akustik GmbH	DE
42	Valid8.com, Inc.	US
43	Vodafone GmbH	DE
44	Volkswagen AG	DE
45	Volkswagen AG (CARIAD)	DE
46	Volkswagen Infotainment GmbH	DE
47	Volvo Car Corporation AB	SE

Table 2: List of observers

	Organization Name	Country
1	5G Automotive Association	DE
2	7LAYERS GmbH	DE
3	ANGA e.V.	DE
4	European Emergency Number Association	BE
5	GSM MoU Association	GB
6	Applus IDIADA	ES

Figure 1: Logos of participating vendors

6 Technical and Project Management

6.1 Interoperability Tests

The interoperability test specification is available as ETSI TS 103 683 [6]. It contains a set of pro-forma table corresponding to test scenarios to be executed by vendors, and it provides guidance to participants for executing and assessing the test sessions.

The current version of the interoperability test specification was published in February 2023 as ETSI TS 103 683 V2.1.1 “Mobile Standards Group (MSG); Testing; Next Generation eCall High Level Application Protocol (HLAP) Interoperability Testing” [6]. Interoperability tests are grouped in two major groups of basic and advanced tests. The below tables Table 3 to Table 7 show the Test IDs, Titles (as used in ETSI TS 103 683 [6]) and indicate if the tests were assumed to be executable during the NG eCall Plugtests event.

Table 3: Basic Tests

Test case ID	Title	Executable
TD_BAS_01	Initiation of manual eCall	Yes
TD_BAS_02	Initiation of automatic eCall	Yes
TD_BAS_03	Initiation of test eCall	No
TD_BAS_04	MSD transfer to PSAP supporting IMS eCall	Yes
TD_BAS_05	MSD transfer to PSAP supporting IMS eCall in roaming scenario	Yes
TD_BAS_06	PSAP initiated call-back to IVS	Yes
TD_BAS_07	PSAP initiated call clear-down	Yes
TD_BAS_08	IVS initiated call clear-down not allowed	Yes
TD_BAS_09	Verification of audio interfaces of IVS and PSAP	Yes
TD_BAS_10	MSD update on request from PSAP	Yes
TD_BAS_13	Format of encoded and decoded MSD in accordance with EN 15722:2015	Yes
TD_BAS_15	Negative acknowledgment for the initial MSD	Yes
TD_BAS_16	Format of encoded and decoded MSD in accordance with EN 15722:2020	Yes

Table 4: Advanced Tests for PSAP and IVS

Test case ID	Title	Executable
TD_ADV_01	MSD transfer to PSAP supporting IMS eCall over IPv4	No
TD_ADV_02	MSD transfer to PSAP supporting IMS eCall over IPv6	No
TD_ADV_04	MSD transfer to PSAP not supporting IMS eCall	Yes
TD_ADV_05	IMS eCall establishment with IMS emergency registration	Yes
TD_ADV_06	IMS eCall establishment without IMS emergency registration	Yes
TD_ADV_07	IMS eCall establishment without IMS emergency registration GIBA supported	No
TD_ADV_08	MSD transfer via in-band modem after negative acknowledgment for the MSD	Yes
TD_ADV_09	MSD transfer via in-band modem after missing acknowledgment for the MSD	Yes
TD_ADV_10	MSD transfer via in-band modem after missing MSD in INVITE request	Yes
TD_ADV_11	MSD update during PSAP initiated call back	No

Table 5: Advanced Tests for IVS

Test case ID	Title	Executable
TD_ADV_IVS_01	Fallback to legacy eCall following busy during call setup	Yes
TD_ADV_IVS_02	Fallback to legacy eCall following unavailable response during call setup	Yes
TD_ADV_IVS_03	Fallback to legacy eCall following no-answer during call setup	Yes
TD_ADV_IVS_04	Dropped eCall after MSD has been acknowledged	Yes
TD_ADV_IVS_05	Dropped eCall before call has been established - reattempt to CS	Yes
TD_ADV_IVS_06	IVS configured for 'eCall only' service (restricted)	Yes
TD_ADV_IVS_07	eCall is attempted when no networks are available (limited-service condition with forbidden PLMN on SIM/USIM)	No
TD_ADV_IVS_08	MSD transfer to PSAP supporting IMS eCall via PLMN without VoIMS support	No
TD_ADV_IVS_09	Termination of manually triggered eCall by vehicle occupant	Yes
TD_ADV_IVS_10	Termination of automatically triggered eCall by vehicle occupant not allowed/not possible	Yes
TD_ADV_IVS_11	Ongoing eCall shall not be disconnected if new trigger is received	Yes
TD_ADV_IVS_12	No Fallback to legacy eCall following busy during call setup	Yes
TD_ADV_IVS_13	No Fallback to legacy eCall following unavailable response during call setup	Yes
TD_ADV_IVS_14	Dropped eCall after MSD has not been acknowledged - reattempt to PS	Yes
TD_ADV_IVS_15	Dropped eCall before call has been established - reattempt to PS	Yes
TD_ADV_IVS_16	Test eCall is not attempted when no networks are available (limited-service condition with forbidden PLMN on SIM/USIM)	No
TD_ADV_IVS_17	Reattempt of eCall following no-answer during call setup	Yes

Table 6: Advanced Tests for PSAP

Test case ID	Title	Executable
TD_ADV_PSAP_01	PSAP handling of more than 1 eCall simultaneously	Yes
TD_ADV_PSAP_02	PSAP correct MSD additional data decoding	Yes
TD_ADV_PSAP_03	Rerouting to another PSAP/emergency control centre	No
TD_ADV_PSAP_04	PSAP operator user interface	Yes
TD_ADV_PSAP_05	Invalid MSD	Yes

Table 7: Advanced Tests for TPS

Test case ID	Title	Executable
TD_ADV_TPS_01	TPSP and rerouting to national PSAP	No
TD_ADV_TSP_02	Conference call between TPS IVS, TPSP and national PSAP	No

6.2 Justification for not executable Interoperability Tests

The justification, why certain tests from ETSI TS 103 683 [6] are indicated in the above tables Table 4 to Table 7 as not executable are summarised in the below Table 8.

Table 8: Reasons for not executable tests

Test case ID(s)	Justification
TD_BAS_03	Test eCalls using E.164 addressing can be tested, but test eCalls the using the service URN "urn:service:test.sos.ecall" are not supported.
TD_ADV_01	Gm interface (P-CSCF <-> IVS) only assigns IPv6 addresses to the IVS.
TD_ADV_02	Remote PSAPs and locally connected PSAPs are only connected via IPv4 addresses to the Event SBC.
TD_ADV_07	GIBA is not used in the IMS for VoLTE.
TD_ADV_11	Priority header field with the header field value “psap-callback” to send an updated MSD during a PSAP callback is not supported.
TD_ADV_IVS_07, TD_ADV_IVS_16	Test requires limited service conditions, hence is not foreseen for the Plugtests event in the commercial network environment, to avoid to potential emergency call to a genuine PSAP.
TD_ADV_IVS_08	Test requires a network, which shall indicate support of IMS Emergency Services (EMS) and eCall Over IMS (ECL) and shall not indicate support of Voice over IMS (VoIMS). It is not possible to deactivate this in the live network environment.
TD_ADV_PSAP_03	Rerouting of an eCall inside the test infrastructure to a different PSAP is not possible.
TD_ADV_TPS_01, TD_ADV_TSP_02	Rerouting of TPSP eCall to a regular PSAP is not possible in this setup.

6.3 Test Scheduling

The ETSI Test Report Tool (TRT) was used to manage the test scheduling. There were up to 13 parallel interoperability test sessions of 2 hours, and the test schedule provided pairing sessions for 4 days of testing. In addition, up to 6 parallel conformance test sessions were executed.

6.4 Test Site Layout

The generic test bed used to carry out interoperability tests, during the event, is summarized in Figure 2. In normal operation conditions, the IVS calls *urn:service:sos.ecall.manual* or *urn:service:sos.ecall.automatic*. This call setting is then interpreted by the mobile network as a requirement to connect the IVS with the most appropriate PSAP, able to handle Next Generation (NG) pan EU eCalls, accordingly to the RFC 8147 [1] and EN 17184 [3].

During an NG eCall interoperability event, IVS needed to be connected to a given PSAP in order to carry out the pairing test sessions. Participating parties could use their own SIM cards and also SIM Cards provided by the three participating MNOs. All Emergency Calls of those participating SIM Cards were rerouted to the Plugtests Event SBC. The selection of the assigned PSAPs is therefore achieved by reconfiguration of the routing (MSISDN number to PSAP) in the Event SBC before every test session, by Telekom. In addition, individual E.164 numbers were assigned to each PSAP offering the possibility to set up Non-Emergency Circuit Switched eCalls and NG eCalls.

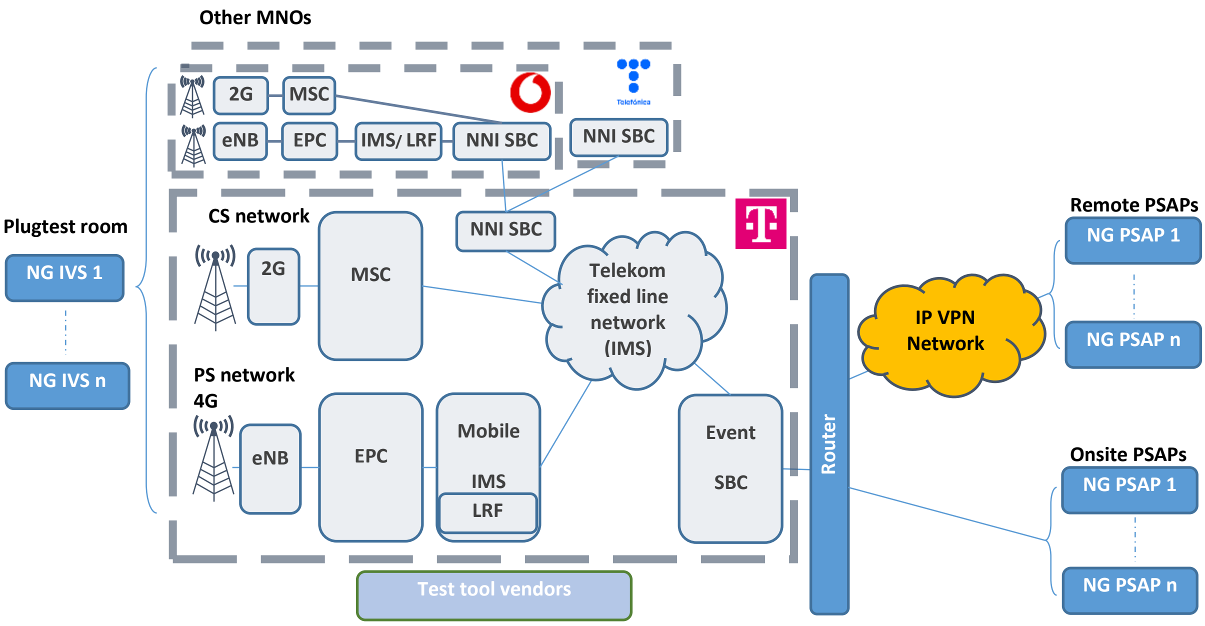

Figure 2: Test Site Layout

VPN tunnels were successfully established between remote PSAPs and the Plugtests environment. Other PSAPs were connected locally. The IVS devices were connected via a public 4G or 2G network using the RAN from participating mobile network operators.

6.5 Interoperability Test Procedure

Each test was executed in the same manner as listed below:

1) Connect devices from different vendors
2) Check connectivity between devices
3) Perform tests according to test description document
4) Check if devices can send/receive messages from each other
5) Check if data is handled correctly in the network and facility layers
6) Result determination and reporting
7) Result OK: run next test
8) Result NOK: check monitor tools to identify source of error
9) Report results in ETSI Test Reporting Tool

7 Results

7.1 Results Reporting

The results of each interoperability test session were recorded using the ETSI Test Report Tool (TRT). After each test execution the interoperability result was documented and agreed among all participants.

Vendors could only access test results of their own test sessions.

7.2 Overall Results

There were 229 tests sessions between 45 participants, using 29 IVS devices, 11 PSAPs and 5 conformance test systems.

From the overall amount of 5350 test cases, 2846 (53%) were executed. From this number, 2473 (87%) were executed successfully.

Interoperability test program contains 47 use-cases, where 10 are not supported by participating MNOs.

2504 test cases (47% of total amount) were skipped according to different reasons.

The Table 9 presents the test-case overall results of test executions.

Table 9: Overall test-case results

Executed		Not Executed		Totals	
Passed	**Failed**	**Not applicable**	**Out-of-time**	**Run**	**Total**
2473 (86.9%)	373 (13.1%)	2504 (46.8%)	(0.0%)	2846 (53.2%)	5350

The Table 10 presents the test-case execution results of interoperability test sessions.

Table 10: Test-case results of interoperability sessions

Interoperability		Not Executed		Totals	
Passed	**Failed**	**Not applicable**	**Out-of-time**	**Run**	**Total**
1794 (86.9%)	260 (13.1%)	1366 (46.8%)	(0.0%)	2054 (53.2%)	3420

Table 11 presents the execution statistics of interoperability test cases, as indicated in the above tables Table 3 to Table 7.

Table 11: Results per use-case

Use-case	Executed		Not Executed		Totals	
	Passed	Failed	Not executed	Out-of-time	Run	Total
TD_BAS_01	134 (95.0%)	7 (5.0%)	2 (1.4%)	0 (0.0%)	141 (98.6%)	143
TD_BAS_02	115 (95.8%)	5 (4.2%)	16 (11.8%)	0 (0.0%)	120 (88.2%)	136
TD_BAS_03	17 (47.2%)	19 (52.8%)	72 (66.7%)	0 (0.0%)	36 (33.3%)	108
TD_BAS_04	130 (97.7%)	3 (2.3%)	1 (0.7%)	0 (0.0%)	133 (99.3%)	134
TD_BAS_05	23 (88.5%)	3 (11.5%)	94 (78.3%)	0 (0.0%)	26 (21.7%)	120
TD_BAS_06	104 (92.9%)	8 (7.1%)	21 (15.8%)	0 (0.0%)	112 (84.2%)	133
TD_BAS_07	130 (99.2%)	1 (0.8%)	2 (1.5%)	0 (0.0%)	131 (98.5%)	133
TD_BAS_08	90 (100.0%)	0 (0.0%)	28 (23.7%)	0 (0.0%)	90 (76.3%)	118
TD_BAS_09	113 (96.6%)	4 (3.4%)	13 (10.0%)	0 (0.0%)	117 (90.0%)	130
TD_BAS_10	66 (63.5%)	38 (36.5%)	25 (19.4%)	0 (0.0%)	104 (80.6%)	129
TD_BAS_13	50 (92.6%)	4 (7.4%)	64 (54.2%)	0 (0.0%)	54 (45.8%)	118
TD_BAS_15	79 (90.8%)	8 (9.2%)	25 (22.3%)	0 (0.0%)	87 (77.7%)	112
TD_BAS_16	114 (95.8%)	5 (4.2%)	8 (6.3%)	0 (0.0%)	119 (93.7%)	127
TD_ADV_01	32 (97.0%)	1 (3.0%)	85 (72.0%)	0 (0.0%)	33 (28.0%)	118
TD_ADV_02	82 (98.8%)	1 (1.2%)	33 (28.4%)	0 (0.0%)	83 (71.6%)	116
TD_ADV_04	26 (66.7%)	13 (33.3%)	57 (59.4%)	0 (0.0%)	39 (40.6%)	96
TD_ADV_05	84 (97.7%)	2 (2.3%)	14 (14.0%)	0 (0.0%)	86 (86.0%)	100
TD_ADV_06	6 (60.0%)	4 (40.0%)	72 (87.8%)	0 (0.0%)	10 (12.2%)	82
TD_ADV_07	0 (0.0%)	1 (100.0%)	89 (98.9%)	0 (0.0%)	1 (1.1%)	90
TD_ADV_08	29 (55.8%)	23 (44.2%)	42 (44.7%)	0 (0.0%)	52 (55.3%)	94
TD_ADV_09	31 (59.6%)	21 (40.4%)	38 (42.2%)	0 (0.0%)	52 (57.8%)	90
TD_ADV_10	16 (61.5%)	10 (38.5%)	59 (69.4%)	0 (0.0%)	26 (30.6%)	85
TD_ADV_11	11 (31.4%)	24 (68.6%)	65 (65.0%)	0 (0.0%)	35 (35.0%)	100
TD_ADV_IVS_01	46 (73.0%)	17 (27.0%)	27 (30.0%)	0 (0.0%)	63 (70.0%)	90
TD_ADV_IVS_02	29 (72.5%)	11 (27.5%)	36 (47.4%)	0 (0.0%)	40 (52.6%)	76
TD_ADV_IVS_03	27 (60.0%)	18 (40.0%)	27 (37.5%)	0 (0.0%)	45 (62.5%)	72
TD_ADV_IVS_04	9 (75.0%)	3 (25.0%)	60 (83.3%)	0 (0.0%)	12 (16.7%)	72
TD_ADV_IVS_05	5 (83.3%)	1 (16.7%)	58 (90.6%)	0 (0.0%)	6 (9.4%)	64
TD_ADV_IVS_06	13 (92.9%)	1 (7.1%)	49 (77.8%)	0 (0.0%)	14 (22.2%)	63
TD_ADV_IVS_07	0 (0.0%)	0 (0.0%)	67 (100.0%)	0 (0.0%)	0 (0.0%)	67
TD_ADV_IVS_08	2 (66.7%)	1 (33.3%)	63 (95.5%)	0 (0.0%)	3 (4.5%)	66
TD_ADV_IVS_09	46 (100.0%)	0 (0.0%)	20 (30.3%)	0 (0.0%)	46 (69.7%)	66
TD_ADV_IVS_10	42 (100.0%)	0 (0.0%)	23 (35.4%)	0 (0.0%)	42 (64.6%)	65
TD_ADV_IVS_11	53 (100.0%)	0 (0.0%)	9 (14.5%)	0 (0.0%)	53 (85.5%)	62
TD_ADV_IVS_12	9 (75.0%)	3 (25.0%)	48 (80.0%)	0 (0.0%)	12 (20.0%)	60
TD_ADV_IVS_13	3 (33.3%)	6 (66.7%)	51 (85.0%)	0 (0.0%)	9 (15.0%)	60
TD_ADV_IVS_14	0 (0.0%)	3 (100.0%)	55 (94.8%)	0 (0.0%)	3 (5.2%)	58
TD_ADV_IVS_15	1 (25.0%)	3 (75.0%)	55 (93.2%)	0 (0.0%)	4 (6.8%)	59
TD_ADV_IVS_16	0 (0.0%)	3 (100.0%)	60 (95.2%)	0 (0.0%)	3 (4.8%)	63
TD_ADV_IVS_17	14 (70.0%)	6 (30.0%)	35 (63.6%)	0 (0.0%)	20 (36.4%)	55
TD_ADV_PSAP_01	40 (97.6%)	1 (2.4%)	26 (38.8%)	0 (0.0%)	41 (61.2%)	67
TD_ADV_PSAP_02	26 (78.8%)	7 (21.2%)	36 (52.2%)	0 (0.0%)	33 (47.8%)	69
TD_ADV_PSAP_03	4 (80.0%)	1 (20.0%)	56 (91.8%)	0 (0.0%)	5 (8.2%)	61
TD_ADV_PSAP_04	55 (100.0%)	0 (0.0%)	20 (26.7%)	0 (0.0%)	55 (73.3%)	75
TD_ADV_PSAP_05	11 (84.6%)	2 (15.4%)	53 (80.3%)	0 (0.0%)	13 (19.7%)	66
TD_ADV_TPS_01	0 (0.0%)	0 (0.0%)	61 (100.0%)	0 (0.0%)	0 (0.0%)	61
TD_ADV_TPS_02	3 (100.0%)	0 (0.0%)	58 (95.1%)	0 (0.0%)	3 (4.9%)	61

7.3 Received comments for failed tests

The following comments have been provided by some or multiple of the NG eCall Plugtests participants for Interoperability tests from ETSI TS 103 683 [6], which have failed during the test sessions.

- **MSD updates during PSAP initiated callback**
  According to clause 5.1.6B in 3GPP TS 24.229 V19.2.0 the PSAP should include the following headers and values in the SIP INVITE of callback:
    - **Priority** header field with header field value **psap-callback**
    - **Accept** header field that includes the value **application/EmergencyCallData.Control+xml**
    - **Recv-Info** header field with header field value **EmergencyCallData.eCall.MSD**

  Those header/values are required to enable MSD transfer (via SIP) during a PSAP callback for an IVS, which implements those new 3GPP Rel-19 requirements.
  NOTE: The 3GPP specifications in Release 19 are still in development. They shall be frozen by end of 2025.
    - A 3GPP Rel-14 to Rel-18 compliant IVS may (or may not) support MSD transfer (via SIP) during a PSAP callback, if those header/values are missing
    - Networks should forward the Priority header transparently; however, networks usually do not allow customers to set a specific priority

  The Priority header field in PSAP callbacks has not been supported by the MNOs during the NG eCall Plugtests event.

- **MSD update via SIP INFO**
  The mechanism to request and transfer MSD updates via SIP INFO has not supported by at least one MNO during the NG eCall Plugtests event.

- **MSD transfer via in-band modem after negative MSD ACK**
  According to parts of clause 5.1.6.11.2 in 3GPP TS 24.229 V19.2.0, a Release 19 compliant IVS shall not initiate the MSD transfer via in-band modem after a negative MSD ACK. In Release 14 to Release 18 of 3GPP TS 24.229 the expected IVS behaviour is to initiate the MSD transfer via in-band modem, in such a case.
  The MSD transfer via in-band modem after a negative MSD ACK has partly not been supported on PSAP side or IVS side during the NG eCall Plugtests event.

- **MSD transfer via in-band modem after missing MSD ACK**
  According to parts of clause 5.1.6.11.2 in 3GPP TS 24.229 in Release 14 to Release 19, a compliant IVS shall initiate the MSD transfer via in-band modem after a missing MSD ACK.
  The MSD transfer via in-band modem after a missing MSD ACK has partly not been supported on PSAP side or IVS side during the NG eCall Plugtests event.

- **SIP 4xx/6xx response including MSD ACK partly not conveyed**
  Some tests require the PSAP to reject an incoming eCall with a SIP 4xx/6xx response, including a positive MSD ACK.
  It has been observed that those SIP 4xx/6xx responses from PSAP that carry Call-Info / XML msg body were partly not conveyed corrected through some (MNO) networks, i.e. due to syntactical errors violating IETF RFC 8147 [1] requirements during the NG eCall Plugtests event.

7.4 Received comments for N/A tests

The following comments have been provided by some or multiple of the NG eCall Plugtests participants for Interoperability tests from ETSI TS 103 683 [6], which have been indicated as “not applicable” (N/A) during the test sessions.

- **MSD updates during PSAP initiated callback**
  According to clause 5.1.6B in 3GPP TS 24.229 V19.2.0 the PSAP should include the following headers and values in the SIP INVITE of callback:
    - **Priority** header field with header field value **psap-callback**
    - **Accept** header field that includes the value **application/EmergencyCallData.Control+xml**
    - **Recv-Info** header field with header field value **EmergencyCallData.eCall.MSD**

  Those header/values are required to enable MSD transfer (via SIP) during a PSAP callback for an IVS, which implements those new 3GPP Rel-19 requirements.

NOTE: The 3GPP specifications in Release 19 are still in development. They shall be frozen by end of 2025.

- A 3GPP Rel-14 to Rel-18 compliant IVS may (or may not) support MSD transfer (via SIP) during a PSAP callback, if those header/values are missing
- Networks should forward the Priority header transparently, however networks usually do not allow customers to set a specific priority

The Priority header field in PSAP callbacks has not been supported by the MNOs during the NG eCall Plugtests event.

- **IPv4 setup not testable**
  The MNO assigns only IPv6 address to IVS for emergency bearer, hence the IPv4 setup has not been testable during the NG eCall Plugtests event.

- **MSD version 2 compliance partly not testable**
  PSAPs shall support MSD version 2 (according to EN 15722:2015) and MSD version 3 (according to EN 15722:2020 [2]).
  An IVS shall only support MSD version 3 in PS domain.
  Some IVS implementations were not able to support MSD version 2 during the NG eCall Plugtests event.

- **SIP 4xx/6xx response including MSD ACK partly not testable**
  Some tests require the PSAP to reject an incoming eCall with a SIP 4xx/6xx response, including a positive MSD ACK.
  Some PSAP implementations could not be configured to respond with a SIP 4xx/6xx, including a positive MSD ACK, during the NG eCall Plugtests event.

- **Tests which require a "dropped eCall" partly not testable**
  Some tests require a "dropped eCall".
  A “dropped eCall" was hardly to realize in a live network, during the NG eCall Plugtests event.

- **Invalid MSD partly not testable**
  For a single test the IVS should be configured to send an invalid MSD in the SIP INVITE.
  Some IVS implementations were not able to support sending an invalid MSD, during the NG eCall Plugtests event.

7.5 Additional functionality

During the NG eCall Plugtests 2025 the NG112 use case has been successfully tested. The Location Information Server (LIS) received the MSD that the NG eCall Router took from the eCall from the IVS. The LIS stores the MSD for a short time in a database amongst other possible location information (cell information, AML data, etc) and makes it available for the PSAP to retrieve.

In this case, the IVS places the NG eCall (or legacy eCall112) that is routed via the NG eCall Router by the network. The NG eCall Router extracts the MSD and forwards it via the standardized <ic> interface and HELD (Http Enabled Location Delivery) protocol to the LIS Server. The LIS stores the MSD.

The NG eCall Router then routes the call as a regular emergency call to the destination PSAP.

The PSAP accepts the call and queries the LIS Proxy via the standardized <im> interface for the MSD data using the MSISDN of the IVS.

8 Event feedback and wrap up meeting summary

8.1 Technical issues detected and solved during the event

The following technical issues have been detected and solved during the NG eCall Plugtests events.

- PSAP Callback / Outgoing Calls – initially one PSAPs was not able to setup outgoing calls.
- MSD Updates via SIP INFO – initially the Event SBC transformed SIP messages with a Multipart Body with one element into SIP messages with a single Body Element (Non-Multipart).

- Emergency / eCall Call Routing for Roamer SIMs (+43/+88) – if the call originator used a MSISDN beginning with +43 or +88 this initially resulted in multiple internal call attempts and missing SIP headers, like Call-Info.
- GSM fallback when triggering NG eCall – all suitable LTE cells around the testing facilities are enabled with ECL. Most GSM fallbacks were related to an unsuccessful first attempt via LTE (e.g. received a SIP Error Response).
- Limitation of Telekom Retail SIM (provided for the Event) for Non-Emergency NG eCalls with NG eCall specific Headers and Bodies
    - Basic calls without NG eCall specific headers worked without limitations
    - There is no indication that other SIMs (M2M/Vodafone/Telefonica-o2) were affected by this issue
- Remote PSAPs reported a delay of forwarding their messages through the Event SBC to the Caller / IVS
    - One PSAP vendor reported a delay / re-transmission of certain SIP messages
    - This was probably related to the limitation of the VPN solution in regard to MTU size, SIP-ALG use and missing MTU Path Discovery Feedback mechanism for packets exceeding the packet size limitations
    - From Telekom side a working MTU size was confirmed to be 1000 Bytes to work around VPN limitations

8.2 Technical issues detected and not solved during the event

The following technical issues have been detected and have not been solved during the NG eCall Plugtests events.

- Test Cases involving sending a SIP 4xx/5xx/6xx response from the PSAP for an initial INVITE
    - We observed a conversion of the MSD ACK Body in SIP 4xx/6xx responses to a Single Body (from Multipart-Body) and a missing Call-Info Header towards the IVS
- Limitation of Telekom Retail SIM (provided for the Event) for Non-Emergency NG eCalls with NG eCall specific Headers and Bodies
    - There was an issue (Receiving SIP 500 on Initial INVITE) when using Telekom Retail SIMs provided for the Event and setting up a test eCall (Non-Emergency Call) using the Public Telephone Number of the Destination PSAP and including the NG eCall specific Headers and Body (MSD)
- Missing Headers in SIP INFO Messages on one of the MNOs
- Test eCalls using Long Numbers / E.164 Numbers on other MNOs:
    - Removing MSD Body before it reaches destination
- PSAP callbacks demanding “Priority: psap-callback” for Authentication to send updated MSD is not available in Germany
- Some implementations do not fully follow the standards (e.g. missing SIP headers, MSD length > 140 bytes, XML is case sensitive)
    - nevertheless, PSAPs should evaluate the received MSD and shall not terminate an eCall (see clause 7.11 and 7.17.1 of EN 16072:2025 [11])

8.3 ETSI TS 103 683 updates

The following changes to the test specification ETSI TS 103 683 [6] have been made during the NG eCall Plugtests event.

- ETSI TS 103 683 should be updated to consider the latest CEN and 3GPP versions (e.g. MSD transfer via in-band modem after negative MSD ACK, MSD updates during PSAP callback)
- tests with "dropped eCall" are hardly to execute
- add a new item in the test TD_ADV_10 and in Table 10 because not every IVS supports to trigger a NG eCall, without MSD in SIP INVITE
- clarify differences in related tests (TD_ADV_IVS_01 vs. TD_ADV_IVS_12)
- update the test TD_BAS_16 to change numberOfPassengers field to numberOfOccupants
- update the test TD_ADV_IVS_02 to specify if SIP 480 should include an MSD ACK/NACK or not
- update tests with in-band MSD transfer to specify PSAP PUSH vs. PULL mode
- update the tests TD_BAS_13, TD_BAS_16 and Table 10 because an IVS shall only support MSD version 3 in PS domain

8.4 Proposal for standardization / regulation updates

The following proposals for the standardization or regulation updates have been made during the NG eCall Plugtests event.

- Make support of test eCalls in PS domain mandatory for PSAPs and network operators
- A standardized test endpoint at every PSAP has been suggested
- In PSAP callbacks, PSAPs should verify if 200 OK (INVITE response) contains Accept header and Recv-Info header. In case those headers are missing, it may be assumed, that MSD updates via SIP INFO are not supported (e.g. due to missing support by the network)
- There is no possibility to test NG eCall in a VPLMN, as Non-Emergency NG eCalls are carried out in the HPLMN as S8-Homerouting is predominantly used for VoLTE Roaming => it shall be considered to define additional test URNs for test eCalls in VPLMNs

8.5 General comments

The following general comments have been made during the NG eCall Plugtests event.

- It is recommended to reduce the volume of loudspeakers to avoid disturbing other test sessions
- Conformance test systems generate a lot of heat hence they should be placed in large or well-air-conditioned test rooms
- Removal of tests in TRT which are not supported
- In roaming setups PSAPs are typically using old audio codecs (e.g. G.711) but advanced audio codecs (e.g. AMR-NB, AMR-WB) are available for free since November 2024
=> consider recommending an advanced audio codec for IVS and PSAP to avoid audio transcoding

Annex A: Interoperability Implementation Guide

The following implementation guidance describes the current limitations of test eCall in PS domain and describes a potential workaround.

According to clause 7.3.2 of EN 17184:2024 [3] an IVS shall support test eCalls. For test eCalls no emergency signalling shall be used but a regular (non-emergency) IMS call. According to clause 7.3.2 of EN 17184:2024 [3] test eCalls shall also include the transfer of an MSD via SIP, but this has not been defined in the underlying core specifications from 3GPP/ETSI in Release 14 to 18. This and other gaps have been summarised in the CEN Liaison Statement [i.2] from CEN/TC 278/WG 15 to 3GPP/ETSI. 3GPP has recently closed this and other gaps in Release 19 of 3GPP TS 24.229 [10].

To realize a test eCall in a commercial PS network all network elements, which are required for test eCalls, need to support the newly added 3GPP Release 19 features related to test eCalls.

3GPP Release 19 should be frozen by end of 2025 and it is assumed that it will require multiple years before those newly added 3GPP Release 19 features will be implemented by MNO suppliers and rolled out by MNOs in commercial networks.

During the ETSI NG eCall Plugtests mainly automatic eCalls or manual eCalls (including emergency signalling) have been used. Only for the test TD_BAS_03 test eCalls (using non-emergency signalling) have been used. Deutsche Telekom configured the network to filter emergency calls (and eCalls) based on known MSISDN numbers, to route those emergency calls to the Event SBC (see Figure 2). Beside the MSISDN number also other criteria could be applied (e.g. location, cell ID etc.) for the filtering mechanism.

Other MNOs could follow a similar approach also in other countries. The MNOs would need to implement respective filter mechanism e.g. based on the analysis of specific information data, which can be included either in a SIP header and/or XML body of a message (e.g. the initial SIP INVITE message) and/or together with an identity information of the originator or based on the cell ID and MSISDN of the test calls. The MNOs would also need to know the specific information data or USIMs (or eSIM profiles) and the corresponding call routing would need to be implemented in advance. A uniform approach applying the method in other countries is considered meaningful, particularly to minimize the risk of diverging results due to different methodologies.

It needs to be considered that the correct handling of real emergency calls is critical. Diverting an emergency call to a test-PSAP by the network side has two potential risks:

1. The special routing is kept (forgotten?) while the same MSISDN is later used by another subscriber or user, which cannot reach real 112 services even though a real emergency case exists.
2. If someone grabs a (test-)terminal found on some desk and is not aware that the SIM inside is for testing purposes only, then the user cannot reach real 112 services even though a real emergency case exists.

Those risks should be managed carefully by either strict processes to ensure a later cleanup of such network configurations or by limitation of such configuration to a certain location and date/time (e.g. only valid during an NG eCall Plugtests event).