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Intelligent Transport Systems (ITS);
Testing;
Conformance test specifications for
Co-operative Awareness Messages (CAM);
Part 2: Test Suite Structure and Test Purposes (TSS & TP)

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 2 of a multi-part deliverable covering Conformance test specification for Co-operative Awareness Messages (CAM) as identified below:

Part 1: "Test requirements and Protocol Implementation Conformance Statement (PICS) proforma";

Part 2: "Test Suite Structure and Test Purposes (TSS & TP)";

Part 3: "Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".

1 Scope

The present document provides the Test Suite Structure and Test Purposes (TSS & TP) for Co-operative Awareness Messages (CAM) as defined in EN 302 637-2 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [6].

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [3] and ISO/IEC 9646-2 [4]) as well as the ETSI rules for conformance testing (ETS 300 406 [7]) are used as a basis for the test methodology.

2 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.

2.1 Normative references

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

[1] ETSI EN 302 637-2 (V1.3.0): "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service".

[2] ETSI TS 102 868-1 (V1.2.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specification for Decentralized Environmental Notification Messages (DENM); Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma".

[3] ISO/IEC 9646-1 (1994): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework - Part 1: General concepts".

[4] ISO/IEC 9646-2 (1994): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 2: Abstract Test Suite specification".

[5] Void.

[6] ISO/IEC 9646-7 (1995): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[7] ETSI ETS 300 406 (1995): "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[8] Void.

2.2 Informative references

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 EG 202 798 (V1.1.1): "Intelligent Transport Systems (ITS); Testing; Framework for conformance and interoperability testing".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 302 637-2 [1], ISO/IEC 9646-1 [3] and in ISO/IEC 9646-7 [6] apply.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACC	Adaptive Cruise Contro
BI	Invalid Behaviour
BV	Valid Behaviour
CA	Cooperative Awareness
CAM	Co-operative Awareness Messages
CAN	Controller Area Network
FMT	Message Format
GFQ	Generation Frequency
INA	INformation Adaptation
ITS	Intelligent Transport Systems
IUT	Implementation Under Test
LF	Low Frequency
MSD	Message Dissemination
MSP	MesSage Processing
PDU	Protocol Data Unit
TP	Test Purposes
TSS	Test Suite Structure

4 Test Suite Structure (TSS)

4.1 Structure for CAM tests

Table 1 shows the CAM Test Suite Structure (TSS) including its subgroups defined for conformance testing.

Table 1: TSS for CAM

Root	Group	Sub-Group	category
CAM	Message Dissemination		Valid behaviour
		Message format	Valid behaviour
		Information adaptation	Valid behaviour
		Generation frequency	Valid behaviour
	Message processing		Valid behaviour

The test suite is structured as a tree with the root defined as CAM. The tree is of rank 3 with the first rank a Group, the second a Sub-group, and the third a category. The third rank is the standard ISO conformance test categories.

4.2 Test groups

The test suite has a total of four levels. The first level is the root. The second level separates the root into various functional areas. The third level is the sub-functional areas if necessary. The fourth level is the standard ISO conformance test categories.

4.2.1 Root

The root identify the Co-operative Awareness Messages (CAM) given in EN 302 637-2 [1].

4.2.2 Groups

This level contains two functional areas identified as:

- Message Dissemination
- Message Processing

4.2.3 Sub-Groups

This level contains three sub-functional areas identified only for the Message Dissemination group and defined as:

- Message format
- Information adaptation
- Generation frequency

4.2.4 Categories

This level contains the standard ISO conformance test categories limited to the valid behaviour and the invalid behaviour.

5 Test Purposes (TP)

5.1 Introduction

5.1.1 TP definition conventions

The TP definition is built according to EG 202 798 [i.1].

5.1.2 TP Identifier naming conventions

The identifier of the TP is built according to table 2.

Table 2: TP naming convention

Identifier	**TP/<root>/<gr>/<sgr>/<x>/<nn> or TP/<root>/<gr>/<x>/<nn> when no <sgr>**		
	<root> = root	CAM	
	<gr> = group	MSD	Message Dissemination
		MSP	Message Processing
	<sgr> =sub- group	FMT	Message Format
		INA	Information Adaptation
		GFQ	Generation Frequency
	<x> = type of testing	BV	Valid Behaviour tests
		BI	Invalid Syntax or Behaviour Tests
	<nn> = sequential number		01 to 99

5.1.3 Rules for the behaviour description

The description of the TP is built according to EG 202 798 [i.1].

The base standards are not using finite state machine concept. As consequence, the test purposes use a generic "Initial State" that corresponds to a state where the IUT is ready for starting the test execution. Furthermore, the IUT shall be left in this "Initial State", when the test is completed.

Being in the "Initial State" refers to the starting point of the initial device configuration. There are no pending actions, no instantiated buffers or variables, which could disturb the execution of a test.

5.1.4 Sources of TP definitions

All TPs are specified according to EN 302 637-2 [1].

5.1.5 Mnemonics for PICS reference

To avoid an update of all TPs when the PICS document is changed, table 3 introduces mnemonics name and the correspondence with the real PICS item number.

Table 3: Mnemonics for PICS reference

Mnemonic	PICS item
PICS_PUBLICTRANS	A.12/1 [2]
PICS_SPECIALTRANS	A.12/2 [2]
PICS_DANGEROUSGOODS	A.12/3 [2]
PICS_ROADWORKS	A.12/4 [2]
PICS_RESCUE	A.12/5 [2]
PICS_EMERGENCY	A.12/6 [2]
PICS_SAFETYCAR	A.12/7 [2]
PICS_LOWFREQUENCYCONTAINER	A.8/3 [2]
PICS_SPECIALVEHICLECONTAINER	A.8/4 [2]
PICS_T_GENCAM	A.22//5 [2]
PICS_T_GENCAMDCC	A.22//4 [2]
PICS_T_GENCAMMAX	A.22//1 [2]
PICS_T_GENCAMMIN	A.22//2 [2]

5.2 Test purposes for CAM

5.2.1 Message dissemination

5.2.1.1 Message format

TP Id	TP/CAM/MSD/FMT/BV-01
Test objective	Check that protocolVersion is set to 1 and messageID is set to 2
Reference	EN 302 637-2 [1], clause B.1
PICS Selection	
Initial conditions	

with {
the IUT being in the "initial state"
}	

Expected behaviour	

ensure that {
when {
a CAM is generated
}
then {
the IUT sends a valid CAM
containing ITS PDU header
containing protocolVersion
indicating value 1
and containing messageID
indicating value 2
}	

TP Id	TP/CAM/MSD/FMT/BV-02
Test objective	Check that LF container is included in first CAM since CA basic service activation
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_LOWFREQUENCYCONTAINER
Initial conditions	

with {
the IUT being in the "initial state"
and the IUT has not sent any CAM yet
}	

Expected behaviour	

ensure that {
when {
a CAM is generated
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing lowFrequencyContainer
}	

TP Id	TP/CAM/MSD/FMT/BV-03
Test objective	Check that LF container is included if time elapsed since the generation of the last CAM with the low frequency container generation is equal or greater than 500 ms
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_LOWFREQUENCYCONTAINER

Initial conditions

```
with {
    the IUT being in the "initial state"
    and the IUT has sent a CAM
        containing cam
            containing camParameters
                containing lowFrequencyContainer at time TIME_1
    and the IUT has not sent CAM
        containing cam
            containing camParameters
                containing lowFrequencyContainer after TIME_1
}
```

Expected behaviour

```
ensure that {
    when {
        a CAM is generated at time TIME_2 >= (TIME_1 + 500 ms)
    }
    then {
        the IUT sends a valid CAM
            containing cam
                containing camParameters
                    containing lowFrequencyContainer
}
```

TP Id	TP/CAM/MSD/FMT/BV-04
Test objective	Check that specialVehicle container is included in first CAM since CA basic service activation
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_SPECIALVEHICLECONTAINER

Initial conditions

```
with {
    the IUT being in the "initial state"
    and the IUT is configured to advertise itself as a special vehicle
    and the IUT has not sent any CAM yet
}
```

Expected behaviour

```
ensure that {
    when {
        a CAM is generated
    }
    then {
        the IUT sends a valid CAM
            containing cam
                containing camParameters
                    containing specialVehicleContainer
}
```

TP Id	TP/CAM/MSD/FMT/BV-05
Test objective	Check that specialVehicle container is included if time elapsed since the generation of the last CAM with the special vehicle container generation is equal or greater than 500 ms
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_SPECIALVEHICLECONTAINER
Initial conditions	

with {
the IUT being in the "initial state"
and the IUT has sent a CAM
containing cam
containing camParameters
containing specialVehicleContainer at time TIME_1
and the IUT has not sent CAM
containing cam
containing camParameters
containing specialVehicleContainer after TIME_1
}	

Expected behaviour	

ensure that {
when {
a CAM is generated at time TIME_2 >= (TIME_1 + 500 ms)
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing specialVehicleContainer
}	

5.2.1.2 Information adaptation

TP Id	TP/CAM/MSD/INA/BV-01-X
Test objective	Check that latest value of in-vehicle data is included in CAM
Reference	EN 302 637-2 [1], clause 5.2
PICS Selection	See permutation table
Initial conditions	

with {
the IUT being in the "initial state"
}	

Expected behaviour	

ensure that {
when {
the IUT is alerted about INFO
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing FIELD set to VALUE
}	

Variants

#	Status	INFO	FIELD	VALUE
01	m	Curvature value	highFrequencyContainer .basicVehicleContainerHighFrequency .curvature	Measured value
02	m	Brake pedal being engaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .brakePedalEngaged	1
03	m	Brake pedal being disengaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .brakePedalEngaged	0

Variants				
#	Status	INFO	FIELD	VALUE
04	m	Gas pedal being engaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .gasPedalEngaged	1
05	m	Gas pedal being disengaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .gasPedalEngaged	0
06	m	Emergency brake being engaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .emergencyBrakeEngaged	1
07	m	Emergency brake being disengaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .emergencyBrakeEngaged	0
08	m	Collision warning being engaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .collisionWarningEngaged	1
09	m	Collision warning being disengaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .collisionWarningEngaged	0
10	m	ACC being engaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .accEngaged	1
11	m	ACC being disengaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accActive .brakePedalEngaged	0
12	m	Cruise control being engaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .cruiseControlEngaged	1
13	m	Cruise control being disengaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .cruiseControlEngaged	0
14	m	Speed limiter being engaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .speedLimiterEngaged	1
15	m	Speed limiter control being disengaged	highFrequencyContainer .basicVehicleContainerHighFrequency .accelerationControl .speedLimiterEngaged	0
16	PICS_LOWFREQUENCYCONTAINER	Low beam headlights being engaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .lowBeamHeadlightsOn	1
17	PICS_LOWFREQUENCYCONTAINER	Low beam headlights being disengaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .lowBeamHeadlightsOn	0
18	PICS_LOWFREQUENCYCONTAINER	High beam headlights being engaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .highBeamHeadlightsOn	1
19	PICS_LOWFREQUENCYCONTAINER	High beam headlights being disengaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .highBeamHeadlightsOn	0

Variants				
#	Status	INFO	FIELD	VALUE
20	PICS_LOWFREQUENCYCONTAINER	Left turn signal being engaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .leftTurnSignalOn	1
21	PICS_LOWFREQUENCYCONTAINER	Left turn signal being disengaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .leftTurnSignalOn	0
22	PICS_LOWFREQUENCYCONTAINER	Right turn signal being engaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .rightTurnSignalOn	1
23	PICS_LOWFREQUENCYCONTAINER	Right turn signal being disengaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .rightTurnSignalOn	0
24	PICS_LOWFREQUENCYCONTAINER	Daytime running lights being engaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .daytimeRunningLightsOn	1
25	PICS_LOWFREQUENCYCONTAINER	Daytime running lights being disengaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .daytimeRunningLightsOn	0
26	PICS_LOWFREQUENCYCONTAINER	Reverse light being engaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .reverseLightOn	1
27	PICS_LOWFREQUENCYCONTAINER	Reverse light being disengaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .reverseLightOn	0
28	PICS_LOWFREQUENCYCONTAINER	Fog lights being engaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .fogLightOn	1
29	PICS_LOWFREQUENCYCONTAINER	Fog lights being disengaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .fogLightOn	0
30	PICS_LOWFREQUENCYCONTAINER	Parking lights being engaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .parkingLightsOn	1
31	PICS_LOWFREQUENCYCONTAINER	Parking lights being disengaged	lowFrequencyContainer .basicVehicleContainerLowFrequency .exteriorLights .parkingLightsOn	0
32	m	Heading value	highFrequencyContainer .basicVehicleContainerHighFrequency .heading	Measured value
33	m	Speed value	highFrequencyContainer .basicVehicleContainerHighFrequency .speed	Measured value
34	m	Drive direction value	highFrequencyContainer .basicVehicleContainerHighFrequency .driveDirection	Measured value
35	m	Yaw rate value	highFrequencyContainer .basicVehicleContainerHighFrequency .yawRate	Measured value

TP Id	TP/CAM/MSD/INA/BV-02
Test objective	Check that publicTransportContainer is included if vehicleRole is set to publicTransport(1)
Reference	EN 302 637-2 [1], clause B.11
PICS Selection	PICS_PUBLICTRANS
Initial conditions	

with {
the IUT being in the "initial state"
the IUT's vehicle role being set to publicTransport(1)
}	

Expected behaviour	

ensure that {
when {
a CAM is generated
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing specialVehicleContainer
containing publicTransportContainer
}	

TP Id	TP/CAM/MSD/INA/BV-03
Test objective	Check that specialTransportContainer is included if vehicleRole is set to specialTransport(2)
Reference	EN 302 637-2 [1], clause B.12
PICS Selection	PICS_SPECIALTRANS
Initial conditions	

with {
the IUT being in the "initial state"
the IUT's vehicle role being set to specialTransport(2)
}	

Expected behaviour	

ensure that {
when {
a CAM is generated
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing specialVehicleContainer
containing specialTransportContainer
}	

TP Id	TP/CAM/MSD/INA/BV-04
Test objective	Check that dangerousGoodsContainer is included if vehicleRole is set to dangerousGoods(3)
Reference	EN 302 637-2 [1], clause B.13
PICS Selection	PICS_DANGEROUSGOODS
Initial conditions	

with {
the IUT being in the "initial state"
the IUT's vehicle role being set to dangerousGoods(3)
}	

Expected behaviour	

ensure that {
when {
a CAM is generated
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing specialVehicleContainer
containing dangerousGoodsContainer
}	

TP Id	TP/CAM/MSD/INA/BV-05
Test objective	Check that roadWorksContainerBasic is included if vehicleRole is set to roadWork(4)
Reference	EN 302 637-2 [1], clause B.14
PICS Selection	PICS_ROADWORKS
Initial conditions	

with {
the IUT being in the "initial state"
the IUT's vehicle role being set to roadWork(4)
}	

Expected behaviour	

ensure that {
when {
a CAM is generated
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing specialVehicleContainer
containing roadWorksContainerBasic
}	

TP Id	TP/CAM/MSD/INA/BV-06
Test objective	Check that rescueContainer is included if vehicleRole is set to rescue(5)
Reference	EN 302 637-2 [1], clause B.15
PICS Selection	PICS_RESCUE
Initial conditions	

with {
the IUT being in the "initial state"
the IUT's vehicle role being set to rescue(5)
}	

Expected behaviour	

ensure that {
when {
a CAM is generated
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing specialVehicleContainer
containing rescueContainer
}	

TP Id	TP/CAM/MSD/INA/BV-07
Test objective	Check that emergencyContainer is included if vehicleRole is set to emergency(6)
Reference	EN 302 637-2 [1], clause B.16
PICS Selection	PICS_EMERGENCY
Initial conditions	

with {
the IUT being in the "initial state"
the IUT's vehicle role being set to emergency(6)
}	

Expected behaviour	

ensure that {
when {
a CAM is generated
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing specialVehicleContainer
containing emergencyContainer
}	

TP Id	TP/CAM/MSD/INA/BV-08
Test objective	Check that safetyCarContainer is included if vehicleRole is set to safetyCar(7)
Reference	EN 302 637-2 [1], clause B.17
PICS Selection	PICS_SAFETYCAR
Initial conditions	

with {
the IUT being in the "initial state"
the IUT's vehicle role being set to safetyCar(7)
}	

Expected behaviour	

ensure that {
when {
a CAM is generated
}
then {
the IUT sends a valid CAM
containing cam
containing camParameters
containing specialVehicleContainer
containing safetyCarContainer
}	

5.2.1.3 Generation frequency

TP Id	TP/CAM/MSD/GFQ/BV-01
Test objective	Check that CAMs are not generated more frequently than T_GenCamMin
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_T_GENCAMMIN
Initial conditions	

with {
the IUT being in the "initial state"
}	

Expected behaviour	

ensure that {
when {
IUT sends a CAM
}
then {
the IUT does not send any CAM before or upon expiry of T_GenCamMin
}
}	

TP Id	TP/CAM/MSD/GFQ/BV-02
Test objective	Check that CAMs are not generated less frequently than T_GenCamMax
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_T_GENCAMMAX
Initial conditions	

with {
the IUT being in the "initial state"
}	

Expected behaviour	

ensure that {
when {
IUT sends a CAM
}
then {
the IUT sends another CAM before expiry of T_GenCamMax
}
}	

TP Id	TP/CAM/MSD/GFQ/BV-03
Test objective	Check that TGenCam is set to T_GenCamMax after generating N_GenCam due to condition 2
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_T_GENCAMMAX
Initial conditions	

with {
the IUT being in the "initial state"
the IUT having sent a CAM at time TIME_1
the IUT having sent an anticipated CAM due to condition 1 at time (TIME_1 + INTERVAL_1)
the IUT having sent (N_GenCam - 1) subsequent CAMs every INTERVAL_1
}	

Expected behaviour	

ensure that {
when {
the IUT sends CAM
}
then {
the IUT sends another CAM after expiry of T_GenCamMax
}
}	

TP Id	TP/CAM/MSD/GFQ/BV-04
Test objective	Check that CAM is generated immediately when the time elapsed since the last CAM generation is equal or greater than T_GenCam_Dcc and the absolute difference between current direction of the originating ITS-S (towards North) and direction included in previous CAM exceeds 4°
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_T_GENCAMDCC
Initial conditions	

with {
the IUT being in the "initial state"
the IUT having sent a CAM at time TIME_1
containing cam
containing camParameters
containing highFrequencyContainer
containing basicVehicleContainerHighFrequency
containing heading set to HEADING_1
the IUT not having sent any other CAM
the IUT is alerted about new heading value HEADING_2
and abs(HEADING_2 – HEADING_1) > 4°
}	

Expected behaviour	

ensure that {
when {
T_GenCam_Dcc expires
}
then {
the IUT sends a CAM immediately
}
}	

TP Id	TP/CAM/MSD/GFQ/BV-05
Test objective	Check that CAM is generated immediately when the time elapsed since the last CAM generation is equal or greater than T_GenCam_Dcc and the current position and position included in previous CAM exceeds 4 m
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_T_GENCAMDCC
Initial conditions	

with {
the IUT being in the "initial state"
the IUT having sent a CAM at time TIME_1
containing cam
containing camParameters
containing basicContainer
containing referencePositionset to POSITION_1
the IUT not having sent any other CAM
the IUT is alerted about new position value POSITION_2
and distance(POSITION_2, POSITION_1) > 4 m
}	

Expected behaviour	

ensure that {
when {
T_GenCam_Dcc expires
}
then {
the IUT sends a CAM immediately
}
}	

TP Id	TP/CAM/MSD/GFQ/BV-06
Test objective	Check that CAM is generated immediately when the time elapsed since the last CAM generation is equal or greater than T_GenCam_Dcc and the absolute difference between current speed and speed included in previous CAM exceeds 0,5 m/s
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_T_GENCAMDCC
Initial conditions	

with {
the IUT being in the "initial state"
the IUT having sent a CAM at time TIME_1
containing cam
containing camParameters
containing highFrequencyContainer
containing basicVehicleContainerHighFrequency
containing speed set to SPEED_1
the IUT not having sent any other CAM
the IUT is alerted about new speed value SPEED_2
and abs(SPEED_2 – SPEED_1) > 0,5 m/s
}	

Expected behaviour	

ensure that {
when {
T_GenCam_Dcc expires
}
then {
the IUT sends a CAM immediately
}
}	

TP Id	TP/CAM/MSD/GFQ/BV-07
Test objective	Check that CAM is generated immediately when the time elapsed since the last CAM generation is equal or greater than T_GenCam and equal or greater than T_GenCam_Dcc
Reference	EN 302 637-2 [1], clause 6.1.3
PICS Selection	PICS_T_GENCAM AND PICS_T_GENCAMDCC
Initial conditions	

with {
the IUT being in the "initial state"
the IUT having sent a CAM
}	

Expected behaviour	

ensure that {
when {
T_GenCam expires
and T_GenCam_Dcc expires
}
then {
the IUT sends another CAM
}
}	

5.2.2 Message processing

TP Id	TP/CAM/MSP/BV-01
Test objective	Check that content of received CAM is transmitted to applications and other facilities
Reference	EN 302 637-2 [1], clause 4.2.2
PICS Selection	
Initial conditions	

with {
the IUT being in the "initial state"
}	

Expected behaviour	

ensure that {
when {
the IUT receives a valid CAM
}
then {
the IUT forwards the CAM content to upper layers
and the IUT forwards the CAM content to other facilities
}
}	

Annex A (informative): Bibliography

- ETSI TS 102 637-1: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 1: Functional Requirements".
- ETSI TS 102 637-4: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic set of applications; Part 4: Operational Requirements".
- ETSI TS 102 894-2 (V1.1.1): "Intelligent Transport Systems (ITS); Users and applications requirements; Part2: Applications and facilities layer common data dictionary".

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