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**Terrestrial Trunked Radio (TETRA);
Conformance testing specification;
Part 5: Security;
Sub-part 3: Abstract Test Suite (ATS)**

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Foreword

This final draft European Telecommunication Standard (ETS) has been produced by the Terrestrial Trunked Radio (TETRA) Project of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Voting phase of the ETSI standards approval procedure.

Every ETS prepared by ETSI is a voluntary standard. This ETS contains text concerning conformance testing of the equipment to which it relates. This text should be considered only as guidance and does not make this ETS mandatory.

This ETS is a multi-part standard and will consist of the following parts:

Part 1: "Radio";

Part 2: "Protocol testing specification for Voice plus Data (V+D)";

Part 4: "Protocol testing specification for Direct Mode Operation (DMO)";

Part 5: "Security".

| Proposed transposition dates | |
|---|---------------------------------|
| Date of latest announcement of this ETS (doa): | 3 months after ETSI publication |
| Date of latest publication of new National Standard or endorsement of this ETS (dop/e): | 6 months after doa |
| Date of withdrawal of any conflicting National Standard (dow): | 6 months after doa |

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1 Scope

This ETS contains two Abstract Test Suites (ATSS) to test the TETRA security V+D and DMO protocols. The protocols are specified, respectively, in ETS 300 392-7 [2] and ETS 300 396-6 [3]. The Test Suite Structure (TSS) and Test Purposes (TPs) for these ATSS are defined in ETS 300 394-5-2 [1].

The objective of this test specification is to provide a basis for approval tests for TETRA equipment giving a high probability of air interface inter-operability between different manufacturer's TETRA equipment.

The ISO standard for the methodology of conformance testing, ISO/IEC 9646-1 [4], ISO/IEC 9646-2 [5], ISO/IEC 9646-3 [6] and ISO/IEC 9646-5 [7], as well as the ETSI rules for conformance testing, ETS 300 406 [9] and ETR 141 [101010101010], are used as a basis for the test methodology.

Annex A and B provide the Tree and Tabular Combined Notation (TTCN) part of these ATSS.

Annex C and D provides the Partial Protocol Implementation eXtra Information for Testing (PIXIT) Proforma of these ATSS.

Annex E and F provides the Protocol Conformance Test Report (PCTR) Proforma of these ATSS.

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 394-5-2: "Terrestrial Trunked Radio (TETRA); Conformance testing specification; Part 5: Security; Sub-part 2: Protocol testing specification for TETRA security".
- [2] ETS 300 392-7: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 7: Security".
- [3] ETS 300 396-6: "Terrestrial Trunked Radio (TETRA); Direct Mode Operation (DMO); Part 6: Security".
- [4] ISO/IEC 9646-1 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General Concepts". (See also CCITT Recommendation X.290 (1991))
- [5] ISO/IEC 9646-2 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification". (See also CCITT Recommendation X.291 (1991)).
- [6] ISO/IEC 9646-3 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)". (See also CCITT Recommendation X.292 (1992)).
- [7] ISO/IEC 9646-5 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment process". (See also CCITT Recommendation X.292 (1992)).
- [8] ISO/IEC 9646-6 (1991): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".

- [9] ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [10] ETR 141 (1994): "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; The Tree and Tabular Combined Notation (TTCN) style guide".

3 Definitions and abbreviations

3.1 TETRA definitions

For the purposes of this ETS, the definitions given in ETS 300 394-5 [1] apply.

3.2 TETRA abbreviations

For the purposes of this ETS the following TETRA abbreviations apply:

| | |
|-------|--|
| CC | Call Control |
| CMCE | Circuit Mode Control Entity |
| DM | Direct Mode |
| DMO | Direct Mode Operation |
| MAC | Medium Access Control |
| MLE | Mobile Link Entity |
| MM | Mobility Management |
| MS | Mobile Station |
| PC | Protocol Control |
| SCLNP | Specific ConnectionLess Network Protocol |
| SDS | Short Data Service |
| SDU | Service Data Unit |

3.3 ISO 9646 definitions

For the purposes of this ETS the following ISO/IEC 9646-1 [4] definitions apply:

Abstract Test Suite (ATS)
Abstract Test Method (ATM)
Implementation Conformance Statement (ICS)
Implementation Under Test (IUT)
Implementation eXtra Information for Testing (IXIT)
Lower Tester (LT)
PICS proforma
PIXIT proforma
Point of Control and Observation (PCO)
Protocol Implementation Conformance Statement (PICS)
Protocol Implementation eXtra Information for Testing (PIXIT)
Service Access Point (SAP)
Single Party Testing (SPyT)
System Under Test (SUT)
Upper Tester (UT)

For the purposes of this ETS the following ISO/IEC 9646-3 [6] definitions apply:

TTCN.GR
TTCN.MP

For the purposes of this ETS the following ISO/IEC 9646-5 [7] definitions apply:

Protocol Conformance Test Report (PCTR)
PCTR proforma

3.4 ISO 9646 abbreviations

For the purposes of this ETS the following ISO/IEC 9646-1 [4] abbreviations apply:

| | |
|-------|---|
| ASP | Abstract Service Primitive |
| ATM | Abstract Test Method |
| ATS | Abstract Test Suite |
| IUT | Implementation Under Test |
| LT | Lower Tester |
| NWK | Network Layer |
| PCO | Point of Control and Observation |
| PDU | Protocol Data Unit |
| PICS | Protocol Implementation Conformance Statements |
| PIXIT | Protocol Implementation eXtra Information for Testing |
| SAP | Service Access Point |
| SPyT | Single Party Testing |
| SUT | System Under Test |
| TC | Test Case |
| TP | Test Purpose |
| TTCN | Tree and Tabular Combined Notation |
| TSS | Test Suite Structure |
| UT | Upper Tester |

For the purposes of this ETS the following ISO/IEC 9646-5 [7] abbreviations apply:

| | |
|------|----------------------------------|
| PCTR | Protocol Conformance Test Report |
|------|----------------------------------|

4 Abstract Test Method (ATM)

This clause describes the ATM used for testing the V+D and DM security protocol. It is the embedded variant of the remote test method used in Single Party Testing (SPyT) context, as defined in ISO/IEC 9646-2 [2], clause 11. This test method has been selected, because:

- this test method implies no specific requirements from the Implementation Under Test (IUT);
- the upper Service Access Point (SAP) of the IUT cannot be directly observed;
- the variety of the possible TETRA implementations is a serious technical obstacle for the adoption of a different ATM;
- this test method places minimum limitations in the realisation of conformance testing.

Operations at NetWork (NWK) layer in the V+D and DM security protocol (for example authentication) affect the content of the link layer PDUs (i.e. MAC PDUs). Therefore link layer test cases have been defined to observe the status of the MAC header when conveying NWK layer information elements.

The selected test method used to test the NWK layer is illustrated in figure 1.

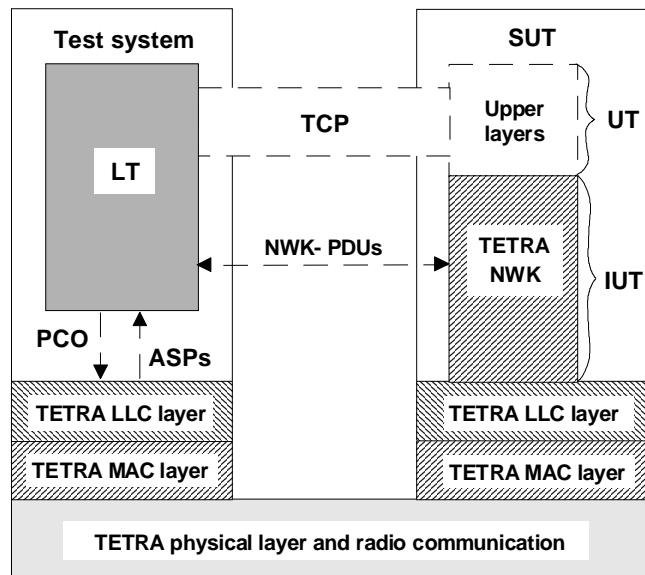


Figure 1: Remote SPyT test method for TETRA Security NWK layer

The selected test method used to test the DM link layer is illustrated in figure 2.

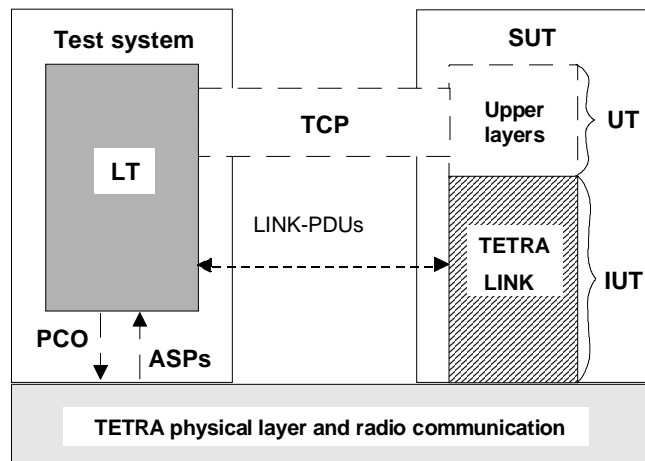


Figure 2: Remote SPyT test method for V+D TETRA Security link layer

4.1 Lower Tester (LT)

A LT is located in a remote TETRA test system. It controls and observes the behaviour of the IUT.

4.2 Upper Tester (UT)

There is no explicit UT in the remote test method, but the TETRA NWK layer or LINK layer and the layers above inside the System Under Test (SUT) are used implicitly for testing the NWK layer or LINK layer.

4.3 Test Co-ordination Procedures (TCP)

The implicit send events defined by the provider of an implementation in annex B serve the purpose of the TCP. They are used as an input to the IUT communicating with the UT to initiate test events at NWK and LINK layers.

4.4 Point of Control and Observation (PCO)

The PCOs for the V+D NWK layer testing are located inside the NWK protocols. Two different test configurations are assumed. One for testing the upper protocols in NWK layer Mobility Management (MM) and another one for invoking Mobile Link Entity (MLE). In the first case PCOs for upper protocols are to be used with test system providing the underlying MLE functionality and in the latter case the PCO inside MLE protocol is to be used. Additionally some Abstract Service Primitives (ASPs) are defined for control and observation purposes. Two other PCOs were defined to test the state of the IUT using the Circuit Mode Control Entity (CMCE) protocol: one to use the call control and an other one to use the Short Data Service (SDS).

The PCO defined for the DM link layer testing is located in the link protocol for testing the MAC header PDUs.

The PCO defined for testing the DM security protocol is located in the NWK layer inside the Short Data Service protocol.

5 ATS conventions

This clause describes the conventions applied to define the ATSS and gives the naming conventions chosen for the different elements of the ATSS.

The ATSS conventions are intended to give a better understanding of the ATSS but they describe also the conventions made for the development of the ATSS, thus for any later maintenance purposes or further development of the ATSS, the conventions described in this clause shall be considered.

5.1 Naming conventions

5.1.1 Declarations part

This subclause describes the naming conventions chosen for the elements of the ATSS declarations part.

5.1.1.1 Test suite type and structured type definitions

The test suite type and test suite structured type identifiers describe the information elements, and each whole word included in the name is written in lowercase starting by an uppercase letter:

| | | |
|----------|--------------------|-----------------|
| EXAMPLE: | CellIdentifierType | simple type |
| | ITSI_Type | structured type |

In the case an abbreviation is included in the declaration name, there is an underscore ("_") before and/or after it, separating it from the rest of the identifier. This rule with abbreviations apply to all the naming conventions in the whole test suite.

5.1.1.2 Test suite operations definitions

The test suite operation identifiers are composed of strings in uppercase letters starting by the uppercase string "TSO_". The different strings in the definition are separated with underscores.

| | |
|----------|-----------------|
| EXAMPLE: | TSO_ENCRYPT_SDU |
|----------|-----------------|

5.1.1.3 Test suite parameter declarations

The test suite parameter identifiers are composed of strings in uppercase letters starting by the uppercase string "PIC_" or "PIX_" and separated by underscores.

If the test suite parameter references a PICS item, the prefix "PIC_" is used.

EXAMPLE 1: PIC_OTAR_CCK_SUPP

If the test suite parameter references a PIXIT item, the prefix "PIX_" is used.

EXAMPLE 2: PIX_MS_ITSI

Complete names as defined in the specifications are used.

5.1.1.4 **Test case selection expression definitions**

The naming conventions for the test case selection expression definitions use free text starting with an uppercase letter. The name of the expression shall explain clearly the selection rule. The test case selection expressions are generally logical combinations of the test suite parameter definitions.

5.1.1.5 **Test suite constant declarations**

The test suite constant identifiers are composed of strings in uppercase letters starting by the uppercase string "TSC_".

EXAMPLE: TSC_TETRA_VERSION

Complete names as defined in the specifications are used. However, in the parameters including a dot character, the dot is replaced by an underscore.

5.1.1.6 **Test suite variable declarations**

The test suite variable identifiers are composed of string in lowercase letters starting by the lowercase string "tsv_".

EXAMPLE: tsv_llc_ul_sdu_nمبر

If the test suite variable represents a system parameter or value, the name defined in the specifications is used. However, in the variables including a dot character, the dot is replaced by an underscore.

5.1.1.7 **Test case variable declarations**

The test case variable identifiers are composed of strings in lowercase letters starting by the lowercase string "tcv_".

5.1.1.8 **PCO declarations**

The point of control and observation identifiers are composed of three to six capital letters, beginning with an "L", as there are only LTs.

EXAMPLE: LMM Represents a PCO on NWK interface for call control PDUs as
LT in the test equipment.

5.1.1.9 **Timer declarations**

Two kinds of timers can be distinguished:

- 1) standardized:
 Those defined in the standard, e.g. T.316, use the same name as in the standard, beginning with a capital "T", except that the dot is replaced by an underscore.

As there is a tolerance margin accepted for these timers, two values are needed:

- the maximum value allowed, which will use the suffix "_Max";
- the minimum value allowed, which will use the suffix "_Min";

EXAMPLE 1: T316_Max

- 2) non-standardized:
Those not defined in the standard, i.e. for execution use, e.g. a timer waiting for a response. These timers begin with the prefix "T_", followed by a string in lowercase letters with each word in the following string starting with an uppercase letter.

EXAMPLE 2: T_IUT_Response
 T_NoResponse

5.1.1.10 **ASP type definitions**

ASP definitions follow the specification in the ETS 300 392-7 [2] or ETS 300 396-6 [3] when a corresponding definition exists. If not, a free name is used.

EXAMPLE: MLE_ACTIVATE_confirm_RegistrationReq
 RESET_MS.

5.1.1.11 **PDU type definitions**

The identifier of a PDU is given in a string in uppercase letters, which represents the layer message.

EXAMPLE 1: D_ENABLE for the D-STATUS layer 3 PDU reception;
 U_AUTHENTICATION_DEMAND for the DISCONNECT layer 3 PDU transmission.

Where the message is a composite word, an underscore character appears in the string.

EXAMPLE 2: U_AUTHENTICATION_DEMAND is the U-AUTHENTICATION DEMAND layer 3 message.

5.1.1.12 **Alias definitions**

No alias definitions are used in the test suite.

5.1.2 **Constraints part**

This subclause describes the naming conventions chosen for the elements of the ATS constraints part.

PDU constraint identifiers shall explain clearly the meaning/contents of the constraint. The PDU identifiers names are defined with:

- 1) the PDU type name in uppercase
- 2) additional names separated with underscores and written in lowercase with each word starting with an uppercase letter.
If the declaration part of the name does not indicate if the constraint is received or sent (U_ for Uplink and D_ for Downlink), then the expression _S or _R shall be added at the end of the name of the constraint.

EXAMPLE 1: DM_SDS_DATA_ENDIS_CONFIRM_Normal_R

The identifier name of structured type constraints shall be written with upper and lower cases. This identifier name shall represent the contents of the constraint.

If formal parameter lists are used, the variable names are written in lowercase. The variable name is the same as the name of the element it is representing starting with prefix "cpa_".

EXAMPLE 2: D_ENABLE_Confirm_TEI(cpa_tei: TEI_Type)

5.1.3 Dynamic part

This subclause describes the naming conventions chosen for the elements of the ATS dynamic part.

5.1.3.1 Test case identifier

The identifier of a TC is built according to table 1:

Table 1: TC naming convention

| | | |
|-----------------------------------|--|--|
| TC_<ts>_<p>_<fm>_<l>_<x>_<s>_<nn> | | |
| <ts> | = test suite | Sec Security |
| <p> | = protocol | VD Voice + Data DM Direct Mode |
| <fm> | = functional module | For Sec layer: AU Authentication OTAR Over The Air Rekeying SED Secure Enable/Disable |
| <l> | = layer | L3 Layer 3 (not in the V+D part) L2 Layer 2 (not in the V+D part) |
| x | = Type of testing | BV Valid Behaviour Tests BI Invalid Behaviour Tests |
| s | = test subgroup (as many subgroups as required) | as defined in the test suite structure |
| <nn> | = sequential number | (01-99) Test Purpose Number |

5.1.3.2 Test step identifier

The test step identifier is built with a string of lowercase letters led by a string of capital letter and joined by an underscore character. The first string indicates the main function of the test step; e.g. PRE for preamble, PST for postamble and LTS for local tree name. The second string indicates the meaning of the step.

EXAMPLES: PRE_Name
 PST_Name
 LTS_Name

5.1.3.3 Default identifier

Six default identifiers are used, namely OtherwiseFail with a prefix indicating the configuration.

EXAMPLES: VD_L2_OtherwiseFail

5.2 TC and TP mapping

There is a one-to-one mapping between the TC identifiers and the TP identifiers. The correspondence rule is given by the following examples:

| TP identifier | TC identifier |
|---------------------------|------------------------|
| TP/S/VD/L3/AU/BV/II/01 | S_VD_L3_AU_BV_II_01 |
| TP/S/VD/L2/OTAR/BV/CCK/01 | S_VD_L2_OTAR_BV_CCK_01 |

**Annex A (normative): ATS for TETRA V+D security NWK layers and TETRA
V+D security link layer**

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [6].

The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the contents table. The ATS itself contains a test suite overview part which provides additional information and references.

A.1 The TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (Sec_VD.PDF contained in archive 39453e1.ZIP) which accompanies the present document.

A.2 The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (Sec.VM.MP contained in archive 39453e1.ZIP) which accompanies the present document.

NOTE: According to ISO/IEC 9646-3 [6], in case of a conflict in interpretation of the operational semantics of TTCN.GR and TTCN.MP, the operational semantics of the TTCN.GR representation takes precedence.

**Annex B (normative): ATS for TETRA DMO security NWK layers and TETRA
DMO security link layer**

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [6].

The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the contents table. The ATS itself contains a test suite overview part which provides additional information and references.

B.1 The TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (Sec_DM.PDF contained in archive 39453e1.ZIP) which accompanies the present document.

B.2 The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (Sec_DM.MP contained in archive 39453e1.ZIP) which accompanies the present document.

NOTE: According to ISO/IEC 9646-3 [6], in case of a conflict in interpretation of the operational semantics of TTCN.GR and TTCN.MP, the operational semantics of the TTCN.GR representation takes precedence.

Annex C (normative): Partial PIXIT proforma for TETRA V+D security

Notwithstanding the provisions of the copyright clause related to the text of this ETS, ETSI grants that users of this ETS may freely reproduce the PICS proforma in this annex so that it can be used for its intended purposes and may further publish the completed PICS.

The PIXIT proforma is based on ISO/IEC 9646-6 [8]. Any additional information needed can be found in this international standard document.

C.1 Identification summary

Table C.1

| | |
|-----------------------|--|
| PIXIT number: | |
| Test laboratory name: | |
| Date of issue: | |
| Issued to: | |

C.2 ATS summary

Table C.2

| | |
|-------------------------|--------------------------------------|
| Protocol specification: | ETS 300 392-7 |
| Protocol to be tested: | |
| ATS specification: | ETS 300 394-5 |
| Abstract test method: | Remote test method, embedded variant |

C.3 Test laboratory

Table C.3

| | |
|---------------------------------|--|
| Test laboratory identification: | |
| Test laboratory manager: | |
| Means of testing: | |
| SAP address: | |

C.4 Client identification

Table C.4

| | |
|---------------------------|--|
| Client identification: | |
| Client test manager: | |
| Test facilities required: | |

C.5 SUT

Table C.5

| | |
|----------------------------------|--|
| Name: | |
| Version: | |
| SCS number: | |
| Machine configuration: | |
| Operating system identification: | |
| IUT identification: | |
| PICS reference for IUT: | |
| Limitations of the SUT: | |
| Environmental conditions: | |

C.6 Protocol layer information

C.6.1 Protocol identification

Table C.6

| | |
|------------------|--------------------------------|
| Name: | TETRA Security - ETS 300 392-7 |
| Version: | |
| PICS references: | |

C.6.2 IUT information

C.6.2.1 Implicit send events

Editor's note: shall be reviewed due to the splitting of the test suites and deletion of test purposes.

Table C.7: Implicit send events

| Item | PIXIT (See note) | Related implicit send message (PDU) | Invocation description |
|------|---|--|------------------------|
| 1 | PIX_IMP_LOCATION_UPDATE_DEMAND_AuthRq | Cause IUT to send U-LOCATION UPDATE DEMAND PDU having given location update type and ITSl and containing an authentication demand. | |
| 2 | IMP_U_LOCATION_UPDATE_DEMAND_AuthRq_CCK | Cause IUT to send U-LOCATION UPDATE DEMAND PDU having given location update type and ITSl and containing an authentication demand and a CCK request. | |
| 3 | IMP_U_LOCATION_UPDATE_DEMAND_CCK | Cause IUT to send U-LOCATION UPDATE DEMAND PDU having given location update type and ITSl and containing a CCK request type 3 element. | |
| 4 | IMP_U_LOCATION_UPDATE_Type | Cause IUT to send U-LOCATION UPDATE DEMAND PDU having given location update type and ITSl. | |
| 5 | PIX_IMP_LOCATION_UPDATE_CellClass1 | Sending of U-LOCATION UPDATE for registration in a class 1 cell implemented | |

| Item | PIXIT (See note) | Related implicit send message (PDU) | Invocation description |
|------|------------------------------------|---|------------------------|
| 6 | PIX_IMP_LOCATION_UPDATE_CellClass2 | Sending of U-LOCATION UPDATE for registration in a class 2 cell implemented | |
| 7 | PIX_IMP_LOCATION_UPDATE_CellClass3 | Sending of U-LOCATION UPDATE for registration in a class 3 cell implemented | |

NOTE: The PIXIT names for the implicit send events in this table are the same as those of the test steps in which the implicit send events are used.

C.6.2.2 Parameter values

Table C.8: General parameter values

| Item | Parameter | Parameter type | Explanation | Value or reference |
|------|-------------------|----------------|---|--------------------|
| 1 | PIX_MS_ITSI | TSI_Type | ITSI of the IUT | |
| 2 | PIX_WRONG_MS_ITSI | TSI_Type | ITSI not corresponding to the ITSI of the IUT | |
| 3 | PIX_TEI | TEI_Type | TEI of the IUT | |
| 4 | PIX_WRONG_TEI | TEI_Type | TEI not corresponding to the TEI of the IUT. | |
| 5 | PIX_GSSI | GSSI_Type | GSSI | |
| 6 | PIX_SSI | SSI_Type | The SSI value of the IUT | |

Table C.9: Authentication parameter values

| Item | Parameter | Parameter type | Explanation | Value or reference |
|------|----------------|---------------------|-----------------------------------|--------------------|
| 1 | PIX_RAND1 | RandomChallengeType | Value of Random challenge (RAND1) | |
| 2 | PIX_RS | RandomSeedType | Value of the Random seed (RS) | |
| 3 | PIX_RES2 | ResponseValueType | Value of the result RES2 | |
| 4 | PIX_WRONG_RES2 | ResponseValueType | Wrong value of the result RES2 | |

Table C.10: OTAR parameter values

| Item | Parameter | Parameter type | Explanation | Value or reference |
|------|----------------------|--------------------|--|--------------------|
| 1 | PIX_CURRENT_CCK | CCK_IdType | Value of the CCK of the current LA | |
| 2 | PIX_OTHER_CCK | CCK_IdType | Value of the CCK of an other LA | |
| 3 | PIX_INVALID_CCK | CCK_IdType | Value of an incorrect CCK | |
| 4 | PIX_CURRENT_SCCK | SealedKeyType | Value of the sealed SCCK of the current LA | |
| 5 | PIX_OTHER_SCCK | SealedKeyType | Value of the sealed SCCK of an other LA | |
| 6 | PIX_INVALID_SCCK | SealedKeyType | Value of an invalid SCCK | |
| 7 | PIX_SCKN | SCK_NbrType | SCK number | |
| 8 | PIX_INVALID_SCKN | SCK_NbrType | Invalid SCK number | |
| 9 | PIX_SCK_VN | SCK_VersionNbrType | SCK version number | |
| 10 | PIX_SSCK | SealedKeyType | Sealed SCK | |
| 11 | PIX_GCK_VN | GCK_VersionNbrType | GCK version number | |
| 12 | PIX_SGCK | SealedKeyType | Sealed GCK | |
| 13 | PIX_INVALID_SGCK | SealedKeyType | Invalid sealed GCK | |
| 14 | PIX_CURRENT_LA | LocationAreaType | Value of the current location area | |
| 15 | PIX_OTHER_LA_DIFF_RA | LocationAreaType | Value for an other location area in an other registration area as the current one. | |
| 16 | PIX_OTHER_LA_SAME_RA | LocationAreaType | Value for an other location area in the same registration area as the current one. | |

Annex D (normative): Partial PIXIT proforma for TETRA DMO security

Notwithstanding the provisions of the copyright clause related to the text of this ETS, ETSI grants that users of this ETS may freely reproduce the PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed PIXIT.

The PIXIT proforma is based on ISO/IEC 9646-6 [8]. Any additional information needed can be found in this international standard document.

D.1 Identification summary**Table D.1**

| | |
|-----------------------|--|
| PIXIT number: | |
| Test laboratory name: | |
| Date of issue: | |
| Issued to: | |

D.2 ATS summary**Table D.2**

| | |
|-------------------------|--------------------------------------|
| Protocol specification: | ETS 300 396-6 |
| Protocol to be tested: | |
| ATS specification: | ETS 300 394-5 |
| Abstract test method: | Remote test method, embedded variant |

D.3 Test laboratory**Table D.3**

| | |
|---------------------------------|--|
| Test laboratory identification: | |
| Test laboratory manager: | |
| Means of testing: | |
| SAP address: | |

D.4 Client identification**Table D.4**

| | |
|---------------------------|--|
| Client identification: | |
| Client test manager: | |
| Test facilities required: | |

D.5 SUT

Table D.5

| | |
|----------------------------------|--|
| Name: | |
| Version: | |
| SCS number: | |
| Machine configuration: | |
| Operating system identification: | |
| IUT identification: | |
| PICS reference for IUT: | |
| Limitations of the SUT: | |
| Environmental conditions: | |

D.6 Protocol layer information

D.6.1 Protocol identification

Table D.6

| | |
|------------------|--------------------------------------|
| Name: | TETRA - DMO Security - ETS 300 396-6 |
| Version: | |
| PICS references: | |

D.6.2 IUT information

D.6.2.1 Implicit send events

Editor's note: shall be reviewed due to the splitting of the test suites and deletion of test purposes.

Table D.7: Implicit send events

| Item | PIXIT (See note) | Related implicit send message (PDU) | Invocation description |
|--|----------------------------------|---|------------------------|
| 1 | PIX_IMP_SDS_DATA_DISABLE_COMMAND | Sending of Disable Command PDU in an SDS DATA PDU implemented | |
| 2 | PIX_IMP_SDS_DATA_SCK_DEMAND | Sending of the DM SDS DATA PDU containing an OTAR SCK demand implemented | |
| 3 | PIX_IMP_DM_SDS_DATA_DMAC_SYNC | True if the IUT supports the sending of the DMO MACSYNC PDU containing a DMO DM-SDS DATA SDU. | |
| NOTE: The PIXIT names for the implicit send events in this table are the same as those of the test steps in which the implicit send events are used. | | | |

D.6.2.2 Parameter values

Table D.8: General parameter values

| Item | Parameter | Parameter type | Explanation | Value or reference |
|------|------------------------|----------------------|---|--------------------|
| 1 | PIX_MS_ITSI | TSI_Type | ITSI of the IUT | |
| 2 | PIX_TEI | TEI_Type | TEI of the IUT | |
| 3 | PIX_SSI | SSI_Type | The SSI value of the IUT | |
| 4 | PIX_TESTER_SSI | SSI_Type | SSI of the tester | |
| 5 | PIX_TESTER_MNI | MNI_Type | MNI of the tester | |
| 6 | PIX_SDS_TIME_REMAINING | DM_TimeRemainingType | Value of the SDS time remaining element used to indicate the current estimate of the SDS channel occupation time. | |

Table D.9: Authentication parameter values

| Item | Parameter | Parameter type | Explanation | Value or reference |
|------|----------------|---------------------|-----------------------------------|--------------------|
| 1 | PIX_RAND1 | RandomChallengeType | Value of Random challenge (RAND1) | |
| 2 | PIX_RAND2 | RandomChallengeType | Value of Random challenge (RAND2) | |
| 3 | PIX_RS | RandomSeedType | Value of the Random seed (RS) | |
| 4 | PIX_RES1 | ResponseValueType | Value of the result RES1 | |
| 5 | PIX_RES2 | ResponseValueType | Value of the result RES2 | |
| 6 | PIX_WRONG_RES2 | ResponseValueType | Wrong value of the result RES2 | |

Table D.10: OTAR parameter values

| Item | Parameter | Parameter type | Explanation | Value or reference |
|------|--------------------|--------------------|---|--------------------|
| 1 | PIX_SCKN | SCK_NbrType | SCK number | |
| 2 | PIX_INVALID_SCKN | SCK_NbrType | Invalid SCK number | |
| 3 | PIX_SCK_VN | SCK_VersionNbrType | SCK version number | |
| 4 | PIX_INVALID_SCK_VN | SCK_VersionNbrType | Invalid SCK version number | |
| 5 | PIX_SSCK | SealedKeyType | Sealed SCK | |
| 6 | PIX_SCK_NOT_KNOWN | Boolean | True if the IUT does not know the value of SCK | |
| 7 | PIX_KG_UNAVAILABLE | Boolean | True if KG is not available to IUT acting as a KH | |

Annex E (normative): Protocol Conformance Test Report (PCTR) proforma for TETRA V+D security

Notwithstanding the provisions of the copyright clause related to the text of this ETS, ETSI grants that users of this ETS may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

The PCTR Proforma is based on ISO/IEC 9646-6 [8]. Any additional information needed can be found in this document.

E.1 Identification summary

E.1.1 Protocol conformance test report

Table E.1

| | |
|---------------------------------|--|
| PCTR number: | |
| PCTR date: | |
| Corresponding SCTR number: | |
| Corresponding SCTR date: | |
| Test laboratory identification: | |
| Test laboratory manager: | |
| Signature: | |

E.1.2 IUT identification

Table E.2

| | |
|-------------------------|--|
| Name: | |
| Version: | |
| Protocol specification: | |
| PICS: | |
| Previous PCTR if any: | |

E.1.3 Testing environment

Table E.3

| | |
|--------------------------------------|--------------------------------------|
| PIXIT number: | |
| ATS specification: | |
| Abstract test method: | Remote test method, embedded variant |
| Means of testing identification: | |
| Date of testing: | |
| Conformance log reference(s): | |
| Retention date for log reference(s): | |

E.1.4 Limits and reservation

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

.....

E.1.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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E.2 IUT conformance status

This IUT has or has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements as specified in clause C.3 in this report and there are no "FAIL" verdicts to be recorded in clause C.6 strike the words "has or". otherwise strike the words "or has not".

E.3 Static conformance summary

The PICS for this IUT is or is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

E.4 Dynamic conformance summary

The test campaign did or did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded in clause C.6 of this report strike the words "did or" otherwise strike the words "or did not".

Summary of the results of groups of test:

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E.5 Static conformance review report

If clause C.3 indicates non-conformance, this subclause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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E.6 Test campaign report

Editor's note: shall be reviewed due to splitting into 2 test suites.

Table E.4

| ATS reference | Selected | Run | Verdict | Observations (see note) |
|--------------------|----------|--------|---------|----------------------------|
| S_VD_AU_BV_II_01 | Yes/No | Yes/No | | |
| S_VD_AU_BV_II_02 | Yes/No | Yes/No | | |
| S_VD_AU_BV_II_03 | Yes/No | Yes/No | | |
| S_VD_AU_BV_II_04 | Yes/No | Yes/No | | |
| S_VD_AU_BV_II_05 | Yes/No | Yes/No | | |
| S_VD_AU_BV_II_06 | Yes/No | Yes/No | | |
| S_VD_AU_BV_TI_01 | Yes/No | Yes/No | | |
| S_VD_AU_BV_TI_02 | Yes/No | Yes/No | | |
| S_VD_AU_BV_TI_03 | Yes/No | Yes/No | | |
| S_VD_AU_BV_TI_04 | Yes/No | Yes/No | | |
| S_VD_AU_BV_TI_05 | Yes/No | Yes/No | | |
| S_VD_AU_BV_TI_06 | Yes/No | Yes/No | | |
| S_VD_AU_BV_TI_07 | Yes/No | Yes/No | | |
| (continued) | | | | |

Table E.4 (continued)

| ATS reference | Selected | Run | Verdict | Observations (see note) |
|---------------------|----------|--------|---------|----------------------------|
| S_VD_AU_BV_TI_08 | Yes/No | Yes/No | | |
| S_VD_AU_BV_TI_09 | Yes/No | Yes/No | | |
| S_VD_AU_BV_TI_10 | Yes/No | Yes/No | | |
| S_VD_AU_BI_01 | Yes/No | Yes/No | | |
| S_VD_OTAR_BV_CCK_01 | Yes/No | Yes/No | | |
| S_VD_OTAR_BV_CCK_02 | Yes/No | Yes/No | | |
| S_VD_OTAR_BV_CCK_03 | Yes/No | Yes/No | | |
| S_VD_OTAR_BV_GCK_01 | Yes/No | Yes/No | | |
| S_VD_OTAR_BV_GCK_02 | Yes/No | Yes/No | | |
| S_VD_OTAR_BV_SCK_01 | Yes/No | Yes/No | | |
| S_VD_OTAR_BV_SCK_02 | Yes/No | Yes/No | | |
| S_VD_OTAR_BI_CCK_01 | Yes/No | Yes/No | | |
| S_VD_OTAR_BI_GCK_01 | Yes/No | Yes/No | | |
| S_VD_OTAR_BI_GCK_02 | Yes/No | Yes/No | | |
| S_VD_OTAR_BI_SCK_01 | Yes/No | Yes/No | | |
| S_VD_OTAR_BI_SCK_02 | Yes/No | Yes/No | | |
| S_VD_SED_BV_TD_01 | Yes/No | Yes/No | | |
| S_VD_SED_BV_TD_02 | Yes/No | Yes/No | | |
| S_VD_SED_BV_TD_03 | Yes/No | Yes/No | | |
| S_VD_SED_BV_TD_04 | Yes/No | Yes/No | | |
| S_VD_SED_BV_TD_05 | Yes/No | Yes/No | | |
| S_VD_SED_BV_TD_06 | Yes/No | Yes/No | | |
| S_VD_SED_BV_TD_07 | Yes/No | Yes/No | | |
| S_VD_SED_BV_TD_08 | Yes/No | Yes/No | | |
| S_VD_SED_BV_TD_09 | Yes/No | Yes/No | | |

(continued)

Table E.4 (continued)

| ATS reference | Selected | Run | Verdict | Observations (see note) |
|-------------------|----------|--------|---------|----------------------------|
| S_VD_SED_BV_PD_01 | Yes/No | Yes/No | | |
| S_VD_SED_BV_PD_02 | Yes/No | Yes/No | | |
| S_VD_SED_BV_PD_03 | Yes/No | Yes/No | | |
| S_VD_SED_BV_PD_04 | Yes/No | Yes/No | | |
| S_VD_SED_BV_PD_05 | Yes/No | Yes/No | | |
| S_VD_SED_BV_PD_06 | Yes/No | Yes/No | | |
| S_VD_SED_BV_PD_07 | Yes/No | Yes/No | | |
| S_VD_SED_BV_PD_08 | Yes/No | Yes/No | | |
| S_VD_SED_BV_PD_09 | Yes/No | Yes/No | | |
| S_VD_SED_BV_EN_01 | Yes/No | Yes/No | | |
| S_VD_SED_BV_EN_02 | Yes/No | Yes/No | | |
| S_VD_SED_BV_EN_03 | Yes/No | Yes/No | | |
| S_VD_SED_BV_EN_04 | Yes/No | Yes/No | | |
| S_VD_SED_BV_EN_05 | Yes/No | Yes/No | | |
| S_VD_SED_BV_EN_06 | Yes/No | Yes/No | | |
| S_VD_SED_BV_EN_07 | Yes/No | Yes/No | | |
| S_VD_SED_BV_EN_08 | Yes/No | Yes/No | | |
| S_VD_SED_BV_EN_09 | Yes/No | Yes/No | | |
| S_VD_SED_BI_01 | Yes/No | Yes/No | | |
| S_VD_SED_BI_02 | Yes/No | Yes/No | | |
| S_VD_SED_BI_03 | Yes/No | Yes/No | | |
| S_VD_SED_BI_04 | Yes/No | Yes/No | | |
| S_VD_SED_BI_05 | Yes/No | Yes/No | | |
| S_VD_SED_BI_06 | Yes/No | Yes/No | | |

Annex F (normative): Protocol Conformance Test Report (PCTR) proforma for TETRA DMO security

Notwithstanding the provisions of the copyright clause related to the text of this ETS, ETSI grants that users of this ETS may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

The PCTR Proforma is based on ISO/IEC 9646-6 [8]. Any additional information needed can be found in this document.

F.1 Identification summary

F.1.1 Protocol conformance test report

Table F.1

| | |
|---------------------------------|--|
| PCTR number: | |
| PCTR date: | |
| Corresponding SCTR number: | |
| Corresponding SCTR date: | |
| Test laboratory identification: | |
| Test laboratory manager: | |
| Signature: | |

F.1.2 IUT identification

Table F.2

| | |
|-------------------------|--|
| Name: | |
| Version: | |
| Protocol specification: | |
| PICS: | |
| Previous PCTR if any: | |

F.1.3 Testing environment

Table F.3

| | |
|--------------------------------------|--------------------------------------|
| PIXIT number: | |
| ATS specification: | |
| Abstract test method: | Remote test method, embedded variant |
| Means of testing identification: | |
| Date of testing: | |
| Conformance log reference(s): | |
| Retention date for log reference(s): | |

F.1.4 Limits and reservation

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

.....

F.1.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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F.2 IUT conformance status

This IUT has or has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements as specified in clause C.3 in this report and there are no "FAIL" verdicts to be recorded in clause C.6 strike the words "has or". otherwise strike the words "or has not".

F.3 Static conformance summary

The PICS for this IUT is or is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

F.4 Dynamic conformance summary

The test campaign did or did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded in clause C.6 of this report strike the words "did or" otherwise strike the words "or did not".

Summary of the results of groups of test:

.....
.....
.....
.....
.....

F.5 Static conformance review report

If clause C.3 indicates non-conformance, this subclause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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.....
.....

F.6 Test campaign report

Editor's note: shall be reviewed due to splitting into 2 test suites.

Table F.4

| ATS reference | Selected | Run | Verdict | Observations (see note) |
|--------------------------|----------|--------|---------|----------------------------|
| S_DM_L2_01 | Yes/No | Yes/No | | |
| S_DM_L2_02 | Yes/No | Yes/No | | |
| S_DM_L2_03 | Yes/No | Yes/No | | |
| S_DM_L3_OTAR_BV_01 | Yes/No | Yes/No | | |
| S_DM_L3_OTAR_BV_02 | Yes/No | Yes/No | | |
| S_DM_L3_OTAR_BV_03 | Yes/No | Yes/No | | |
| S_DM_L3_OTAR_BV_04 | Yes/No | Yes/No | | |
| S_DM_L3_OTAR_BI_01 | Yes/No | Yes/No | | |
| S_DM_L3_OTAR_BI_02 | Yes/No | Yes/No | | |
| S_DM_L3_OTAR_BI_03 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_TD_TAR_01 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_TD_TAR_02 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_TD_TAR_03 | Yes/No | Yes/No | | |
| (continued) | | | | |

Table F.4 (continued)

| ATS reference | Selected | Run | Verdict | Observations (see note) |
|--------------------------|----------|--------|---------|----------------------------|
| S_DM_L3_SED_BV_TD_MNG_01 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_TD_MNG_02 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_TD_MNG_03 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_PD_TAR_01 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_PD_TAR_02 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_PD_TAR_03 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_PD_MNG_01 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_PD_MNG_02 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_PD_MNG_03 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_EN_TAR_01 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_EN_TAR_02 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_EN_TAR_03 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_EN_MNG_01 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_EN_MNG_02 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_EN_MNG_03 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_TEI_01 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_TEI_02 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_REJ_01 | Yes/No | Yes/No | | |
| S_DM_L3_SED_BV_REJ_02 | Yes/No | Yes/No | | |

F.7 Observations

Additional information relevant to the technical content of the PCTR are given here.

.....

Annex G (informative): Bibliography

EWOS/ETSI Project Team No 5: "Project Report and Technical Report. OSI Conformance Testing Methodology and Procedures in Europe".

ETR 022 (1991): "Advanced Testing Methods (ATM); Vocabulary of terms used in communications protocols conformance testing".

History

| Document history | | | |
|------------------|----------------|----------|--------------------------|
| January 1998 | Public Enquiry | PE 9822: | 1998-01-30 to 1998-05-29 |
| April 1999 | Vote | V 9925: | 1999-04-20 to 1999-06-18 |
| | | | |
| | | | |
| | | | |