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Part 1-2: Generic processes and performance Implementation Conformance Statement (ICS)

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New presentation - see History box

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Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

This ETS is one of a family of ETSs covering various aspects of Synchronous Digital Hierarchy (SDH) equipment standards and has been produced in order to provide the Implementation Conformance Statement (ICS) proforma to be used in connection with conformance/approval testing of SDH equipment.

The Structure of this ETS

The ICS proforma will ultimately consist of 8 parts, numbered 1-2 to 8-2, each of them will correspond to a part of the reference ETS 300 417, numbered 1-1 to 8-1 (note), when available:

Part 1 **ETS 300 417-1-2** **"Generic Processes and Performance**
                                Implementation Conformance Statement (ICS) proforma"
Part 2   ETS 300 417-2-2   "Physical Section Layer Functions
                                Implementation Conformance Statement (ICS) proforma"
Part 3   ETS 300 417-3-2   "STM-N Regenerator and Multiplex Section Layer Functions
                                Implementation Conformance Statement (ICS) proforma"
Part 4   ETS 300 417-4-2   "SDH Path Layer Functions
                                Implementation Conformance Statement (ICS) proforma"
Part 5   ETS 300 417-5-2   "PDH Path Layer Functions
                                Implementation Conformance Statement (ICS) proforma"
Part 6   ETS 300 417-6-2   'Synchronisation Distribution Layer Functions
                                Implementation Conformance Statement (ICS) proforma"
Part 7   ETS 300 417-7-2   "Auxiliary Layer Functions
                                Implementation Conformance Statement (ICS) proforma"
Part 8   ETS 300 417-8-2   "(Major) Compound Functions,
                                Implementation Conformance Statement (ICS) proforma"

> NOTE: At present, only ETS 300 417-1-1 and ETS 300 417-1-2 are available. All other parts of this ETS are currently under development.

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

Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given profile. Such a statement is called an Implementation Conformance Statement (ICS).

A client of a test laboratory who requests a conformance/approval test should provide the test laboratory with a completed ICS proforma for each layer to be tested and a detailed system description of the implementation.

The ICS proforma is not another complete description of the related specification, but rather a compact form of its static conformance requirements, to be used by the test laboratory to identify which test should be performed on a given implementation. Not every feature of a profile specification is contained in the related ICS proforma. For particular cases requiring specific information, the ICS can refer to the appropriate clause of the related specification by means of references, notes and or comments.

The ICS proforma captures the implementation flexibility allowed by the related specification and details which options are left to the implementor, and which are conditionally dependent on other options taken by the implementor.

1   Scope

This European Telecommunications Standard (ETS) provides general information about the Implementation Conformance Statement (ICS) proforma structure and contents, as well as guidance for filling-in the document. The ICS proforma for a Synchronous Digital Hierarchy (SDH) Network Element (NE) are defined in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7 [4] and in the ETS 300 406 [5].

The ICS proforma is a normative part of the reference specification.

The supplier of an implementation which is claimed to conform to ETS 300 417-1-1 [6] is required to complete a copy of these ICS proforma, namely this ETS and is further required to provide all information necessary to identify both the implementation (e.g. specify it by means of a detailed system description) and the supplier.

The client of the test laboratory might be identified by means of the System Conformance Statement (SCS) and a client checklist. Those proforma are included in annex B of this document. The use of SCS proforma and client checklist is not mandatory, any suitable means of providing such information is acceptable.

According to ETS 300 406 [5] the ICS proforma has two main objectives:

-    within the context of conformance testing, to be the reference document for the conformance assessment process related to the Implementation Under Test (IUT);

-    outside the context of conformance testing, to provide an overview of the implementation.

Concerning the conformance assessment process, the ICS proforma is used:

-    as the description of the IUT for the static conformance review;

-    as an element of description of the IUT capabilities for the test case deselection;

-    as an element of description of the IUT for the test suite parametrization;

-    as a reference document for the analysis of the results;

-    for inclusion with the final test report.

Outside the conformance testing context, the ICS proforma is or may be used:

-    to provide an overview of the capability supported by the implementation; [1]

-    to statically check the interworking capacities of two implementations;

-    as a standard checklist of the base specification conformance requirements.

When requesting conformance/approval testing of an an SDH layer implementation, the supplier should always fill all the ICS proforma relevant for that layer. In the case where more than one instance of the same layer appears in the detailed system description, the client of a test laboratory should clearly identify any differences existing between these instances (if any).

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[1]   Each capability of the ICS associated implementation is described as a conformance statement which is the result of the answer, by the supplier, of the dedicated ICS item.

2 Normative references

This ETS incorporates by dated or 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 amendments or revisions. For undated references the latest edition of the publication referred to applies.

[1] ISO/IEC 9646-1 (1991): "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[2] ISO/IEC 9646-2 (1991): "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification".

[3] 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".

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

[5] ETS 300 406 (1994): "Method for Testing and Specification (MTS); Protocol and profile conformance testing specifications Standardization Methodology".

[6] ETS 300 417-1-1 (1994): "Transmission and Multiplexing (TM); Generic functional requirements for Synchronous Digital Hierarchy (SDH) transmission equipment Part 1-1: Generic processes and performance".

3 Definitions and Abbreviations

3.1 Definitions

For the purposes of this ETS the following terms apply:

ICS: An Implementation Conformance Statement (ICS) is necessary to evaluate the performance of a particular system. It is a statement of the capabilities and options which have been implemented, for each specification which is supported in order that the system can be tested against relevant requirements and those requirements only.

profile: A profile identifies a consistent set of chosen options from a base specification or from a set of base specifications, in order to provide a given function in a given environment.

By restricting choices among the options available in the base specifications, a profile increases the probability that systems will interoperate, i.e. perform together the given function to which the profile is aimed at.

The base specifications upon which a profile is based are called components of this profile. In other words, a profile specifies a superset of subsets of base specifications. Further details on the definition of a profile may be found in ETS 300 406 [5].

profile specific ICS proforma: A profile requirements list plus the set of ICS proformas which when completetd for a system and taken together with the profile requirements list become a profile ICS.

profile specific ICS: An ICS for a system claimed to conform to a given profile, answering questions which are profile-specific and which are additional to the base specification ICS proforma items listed in the profile requirements list..

reference specification(s): It is a standard which specifies a base specification, or a set of base specifications, or a profile, or a set of profiles, and for conformance against which test specifications are written.

reference standard(s): Synonymous to reference specification.

3.2 Abbreviations

For the purpose of this ETS the following abbreviations apply:

CTR   Conformance Test Report
DSD   Detailed System Description
LID   Layer Instance iDentifier
ISO   International Standard Organization
IEC   International Electrotechnical Commission
ICS   Implementation Conformance Statement
IXIT   Implementation eXtra Information for Testing
IUT   Implementation Under Test
RSE   Remote Single Layer Embedded
SCS   System Conformance Statement
SCTR   System Conformance Test Report

4 ICS proforma structure and contents

The ICS Proforma is a set of tables containing pre-printed text and structured according to ISO/IEC 9646-7 [4] (Version 1.8, 15 July 1993). They describe any layer implementation which is specified in ETS 300 417-1-1 [6].

The structure of these ICS proforma are in accordance with what is specified in clause 5 of ISO/IEC 9646-7 [4] and satisfies the requirements specified in subclauses 8.1 to 8.4, 9.1 to 9.5 and clause 10 of that document.

An ICS proforma is basically a set of tables containing three types of questions requiring boolean, numerical or literal answers:

-         questions to be answered YES or NO related to whether a feature has been implemented or not. The allowed answers, which reflect the base specification, are documented in the ICS as the STATUS (indicated in the "Status" column); the answers constitute the SUPPORT (contained in the "Support" column);

-         questions on numerical values implemented (e.g. timers, for numerical parameters, for frequencies, etc.). The legitimate range of variation of this value, which reflects the base specification, is documented in the ICS in the "Requirement description and details". The answers constitute the SUPPORTED VALUES and are contained in the "Support" column;

-         questions on options implemented. The choice among which one of the options presented should be made. The possible options, which depend on the base specification, are documented in the ICS in the "Requirement description and details". The answers constitute the SUPPORTED OPTION.

5 Pre-printed table contents

The pre-printed contents of the ICS tables provide the following:

Table header section:

Section description	References
A table identifier (see clause 6) and its title derived from ETS 300 417-1-1 and parts 2-1 to 8-1 to be published later.	
Reference to document(s) whose requirements are listed in the table.	Reference document
Reference to every instance of that layer (SET OF), in the detailed system description, described by that group of ICS proforma (Option tables only). See clause 9.	Instance(s) references list
The layer instance identifier field contains a unique identification number indicating which table set is relevant for a given instance of that layer.	Layer instances identifier

Table body:

Section Description	References
Item identification number (see clause 6).	Item no.
Reference to the relevant atomic function.	Atomic function(s)
Item names or short item descriptions.	Requirement description and details
Reference to clause contained in the document(s) specified in the "Reference Document" field.	Document reference
References to standards which are directly or indirectly referred to in the document listed in the "Reference Document" field.	Normative reference
Status attributes specifying the status of the items (see clause 8).	Status
Identifier of a boolean expression indicating if and which conditional status apply (see clause 7)	Predicate
Column to be filled in by the supplier (see clause 10):	Support
Definition of name and Boolean expression of a predicate used in the predicate column. A short comment in plain English may be present.	Predicate section

6 Table / item identification

Each ICS profile table is provided with an identification label pre-printed to the left in the table headers. The label is composed as follows:

- a capital letter O, T, or D (they identify respectively the option, transmission and the defect table);
- underscore;
- an acronym labelling the synchronous layer which it refers to according to ETS 300 417-1-1 [6].

Each ICS table is uniquely and unambiguously identified by the Layer Instance iDentifier (LID) and its pre-printed identification label.

Each item in an ICS table is provided with a serial number in the left-hand table column named "Item No.". Nested item numbering is used where the relationship among the items within a single table is such that there is a nested structure of conditionals, with nested items at a given level (e.g. 1.2.x) being conditional upon the immediately previous item at the next higher level (i.e. 1.2 in this example). The conditional structure pointed out by the nested items numbering is only logical. Any nested item can be of any status independently from the higher level item's status.

Each item in an ICS table is cross-referenced to ETS 300 417-1-1 [6] by the column named "Atomic Function(s)" which contain the indication of the atomic functional block that, according to this ETS, should

implement the requirement described in the next column. When a requirement specification is exploded into several others such a reference is only given for the first one.

The "Requirement Specification" column contains a short question or statement asking whether or not a capability is implemented.

Each item is fully referenced to the relevant normative document.

The "Support Column" shall be filled in by the implementor in accordance with the rules stated in clause 10 of this document.

To identify an item unambiguously, the complete table identifier (e.g. the layer instance identifier and the pre-printed table label) and the item number are combined by use of a slash character, "/", e.g. in the transmission table of the STM-1 Regenerator Section Layer ICS for the instance numbered "1" of that layer, the 3rd item is identified by "1.T_RS1/3".

7 Predicate

A predicate value contained in the predicate column in an ICS proforma shall be either:

- an explicit reference to an ICS proforma YES/NO answer; or
- a predicate expression i.e. a boolean expression involving predicates.

The definition of the predicate expression which appears in the predicate column of an ICS proforma can be found at the end of the option table in the predicate section.

8 Status

According to ISO/IEC 9646-2 [2] and ISO/IEC 9646-7 [4], the status attribute in the "Status" column reflects the conformance requirements as follows:

M (mandatory)   The capability is required to be implemented, in conformance with the profile specification. When a mandatory capability is not supported as specified, it is a case of non-conformance, and the client shall give a justification (see clause 10);

O (optional)   The capability may be or may not be implemented, and if it is implemented it is required to conform to the profile specification;

X (prohibited)   There is a requirement NOT TO USE this capability;

NOTE: It may seem unlikely that the status could be unconditionally not-applicable or prohibited, but this is quite possible if there are multiple sets of supports and status columns in a given table for different roles, versions or classes of a given implementation.

C (conditional)   The requirement on the capability depends on the selection of other optional or conditional items; the ICS proforma cannot define in advance a definite status for the capability, it can only indicate how the status depends on the evaluation of a predicate. Such predicates are available in the ICS proforma predicate column;

N/A (- dash)   Non applicable item i.e. no requirement can be expressed in the given context.

The status has a precise meaning concerning the conformance requirement, it does not have a direct meaning concerning the feature. As a result, the way a status constrains the use of a feature is not documented in the ICS.

For example, the fact that a feature is mandatory does not mean that it will always be "present", or "observed". It means that the conformance statement is required to be satisfied by the implementation, and the Implementation Under Test (IUT) cannot "refuse" to exhibit the proper behaviour if it is placed in condition where a conformance requirement from the standard requires it to do so.

Therefore, the capability remains "optional to be used", although it is a mandatory requirement to implement it. In this case, it means that no conformance requirement defines a context in which the IUT would be obliged to use the function. This may produce under particular circumstances a non conformity.

9 Relationship between ICS proforma and detailed system description

Homogeneous layer instances of a layer in the detailed system description are associated with a set of ICS tables namely an Option table (O_XX), a Transmission Table (T_XX) and a Defect Table (D_XX). This association process allows responses to questions such as - for which instance of a layer function a conformance requirement is defined.

This association between instances in the detailed system description and ICS table is made via the first of the three tables defined for every layer, namely the option table.

The option table presents all authorized alternatives to describe the given layer with atomic functions e.g. the presence or absence of a particular atomic function within that layer. When one implementation of the layer can (according to the standard) or cannot support these options, those are defined as optional (O) in the "status" column of the O_XX table.

The reference field in option table indicates to which instance(s) of that layer the three tables O_XX, T_XX and D_XX are related. More than one set of O_XX, D_XX and T_XX can exist for the same layer, linked to a different set of homogeneous instances of that layer. All the instances of every layer in the detailed system description shall appear once only in a reference field of the relevant option table.

In the other tables (T_XX and D_XX tables), the conformance requirements are conditioned by the value of the support column in the O_XX table. This conditioning can be represented by a "predicate" which will depend by the values in the O_XX support column.

The two levels for describing the implementation options, as specified by the standards, allow the unambiguous description of the implementation conformance statement structures as well as their link to the detailed system description and ICS tables.

The detailed system description shall at least contain the following type of information:

-       identification of sets of homogeneous instances of a layer.

10 Filling-in guidance

For each layer to be tested, the associated ICS proforma shall be filled-in by the client.

The filling-in is done in the rows of the right-hand table column named "Support" as follows:

-       the layer Instances identifier shall be input in the appropriate field for every table;
-       the relevant set of homogeneous instances of that layer shall be listed in the "Instance(s) Reference List" field of the option table;
-       for every item which requires a YES/NO (Supported/NOT Supported) answer, a separate tick box is provided for each possible answer and the implementor shall mark those that apply;
-       for every item where the input of a particular value is required it should be placed in the "Support" column in the space following the capital V;
-       for every item which requires a literal answer, the option identifier shall be placed in the "Support" column in the space following the "Opt:" string;
-       if conditional support answers are allowed or when a mandatory (M) capability is not supported, a reference to the relevant predicate should be placed in the "Support" column in the space following the capital X.

For each implemented mandatory item implemented in a way other than specified, a justification shall be given (e.g. as a note added by the client on the relevant ICS page in the space provided for that purpose or as a client statement in a separate paper that shall be added to the ICS proforma as an appendix and listed in the table "Appendix list" given in annex B of this ETS).

Annex A (informative): Note cross- reference table

ICS item reference	Note reference

Annex B (informative): **Client test preparation information related to conformance/approval testing of SDH network element System Conformance Statement (SCS) including client checklist**

B.1 Introduction

A client who requests a conformance/approval test needs to provide the test laboratory with a System Conformance Statement (SCS) and a client checklist. The proforma in this ETS may be used.

The main purpose of the SCS is to identify the client organization and the test candidate.

The purpose of the client checklist is to provide a record of test-related information.

B.2 Proforma structure and contents

The proforma consists of the following tables containing pre-printed guide text:

- CLIENT ORGANIZATION: For identification of the client organization.
- TEST CANDIDATE: For identification and itemizing of the test candidate.
- TEST STATUS OF THE TEST CANDIDATE and TESTING CLAIMs: For indication of the test status of the test candidate, summarizing of the testing claims, provision of references to associated ICS proforma.
- CLIENT CHECKLIST: For provision of a record of test-related information.

B.3 Filling in guidance

The pre-printed guide text in the proforma indicates the kind of information to be filled in by the client.

B.4   Client organization

CLIENT Name:

Street/No.:

Postal Code/City:

Country:

Telephone:

Telefax:

Telex:

Teletex:

CLIENT MANAGER

Name:

Location:

Telephone:

CONTACT PERSON

Name:

Location:

Telephone:

ADDITIONAL INFORMATION (if needed/useful):

B.5   Test candidate

TEST CANDIDATE IDENTIFICATION:			
Name	Model	Version	Serial Number

CONFIGURATION (replaceable unit list and arrangement, software and firmware version, etc.):

SUPPLIER (OPTIONAL, if different from client):

Company: _____   Telephone _____
Street/No.: _____   Telefax: _____
Postal
Code/City: _____   Telex: _____

Country: _____   Teletex: _____

MANUFACTURER (OPTIONAL, if different from client):

Company: _____   Telephone _____
Street/No.: _____   Telefax: _____
Postal
Code/City: _____   Telex: _____
Country: _____   Teletex: _____

B.6   Test status of the test candidate and testing claims

					Tested before? (optional)	Test wanted?	PCTR wanted?	Log wanted?
TEST CANDIDATE REFERENCE (short identification):								
TESTING CLAIMS								
Layer Identifier	If "Yes" in the right column "Tested before?", indicate references to existing test documents (which should be at the disposal of the test laboratory)				Answer by Yes(=Y) or No(=N) according to the claims:			
	ICS	IXIT	SCTR	CTR				
OTHER INFORMATION (indicate any other information that may itemize the test candidate or the testing claims):								

B.7   Client checklist

Ref. subclauses/notes of subclause 6.3.1.3 of ISO/IEC 9646-5 [3]. **Details may be specified in the appropriate IXIT(s) and reference(s) to the relevant IXIT(s) indicated in this checklist**	
Ref. a)	COMPLIANCE WITH ISO/IEC 9646-5 [3] (list exceptions, if any):
Ref. b)	The information (specification of the test candidate, implementation profile to be tested) is given in table B.4 TEST CANDIDATE and B.5 TEST STATUS OF THE TEST CANDIDATE and TESTING CLAIMS.
Ref. c)	The Remote Single Layer Embedded (RSE) test method is used, implying that the degree of equipment testability is sufficient.
Ref. d)	TEST CO-ORDINATION PROCEDURES (explain the procedures suitable for use with the test candidate, and which correspond to the RSE test method or indicate references to clauses of manuals etc. giving such explanations):
Ref. Note a)	PHYSICAL REQUIREMENTS and OTHER PRACTICAL INFORMATION (indicate any physical test requirements)
Ref. Note b)	The information on whom to contact during the conformance assessment process is given in table A.3 CLIENT

History

Document history		
September 1995	Public Enquiry	PE 92: 1995-09-25 to 1996-01-19
April 1996	Converted into Adobe Acrobat Portable Document Format (PDF)	