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Contents

Intellectual Property Rights 5
Foreword 5
Introduction 5
1 Scope 7
2 References 7
3 Definitions and abbreviations 8
3.1 Definitions 8
3.2 Abbreviations 8
4 Prerequisites 9
5 Structure of this style guide 9
6 Overview of the ICS proforma production and use 10
7 How to write an ICS proforma 12
7.1 Annex of a specific document called ICS proforma specification 12
7.2 Annex of the reference specification itself 12
8 General guidelines 13
8.1 Why this style guide should be followed 13
8.2 Which questions and how to structure them 13
8.2.1 Meaningful, unambiguous and useful questions 13
8.2.2 No dynamic requirements 14
8.2.3 Structure and level of detail 15
8.3 How to choose a status 16
8.3.1 m: mandatory 16
8.3.2 o: optional 17
8.3.3 n/a: not applicable 17
8.3.4 x: prohibited (excluded) 18
8.3.5 c <integer>: conditional 18
8.3.6 o.<integer>: qualified optional 18
8.3.7 i: irrelevant 19
8.4 How to deal with two main roles 19
9 Guidelines on ICS proforma tables 20
9.1 Table columns 20
9.2 Table types 22
10 Guidelines on references to items 26
11 Guidelines on conditional items 26
11.1 Condition number 27
11.2 Conditional expression 27
11.3 Predicate applying to a whole clause or a whole table 27
12 Guidelines on qualified optional items 28
13 Guidelines on allowed values column syntax 29
14 Guidelines on the use Microsoft Word 30
14.1 How to use the electronic version of the template 30
14.2 How to use sequences and bookmarks in ICS proforma tables 31
14.2.1 Table and item numbers 31
14.2.2 Conditional items 31
14.2.3 Qualified optional items 32
14.2.4 Summary 32

15 Maintenance aspects 33
16 Guidelines on profile ICS proforma 34
16.1 Guidelines on profile requirement list 34
16.1.1 Guidelines on requirement list tables 35
16.1.1.1 Table title and columns 35
16.1.1.2 Table types 36
16.1.2 Item references 39
16.1.3 Guidelines on conditional and qualified optional items 39
16.1.4 Guidelines on the use of Microsoft Word 39
16.2 Guidelines on profile specific ICS proforma 40
Annex A: Template of an ICS proforma specification 41
A.1 Conventions 41
A.2 Keywords 41
A.3 Title 42
A.4 Introduction clause 42
A.5 Scope clause 42
A.6 References clause 42
A.7 Definitions subclause 42
A.8 Abbreviations subclause 43
A.9 "Conformance to this ICS proforma specification" clause 43
Annex B: Requirement list example 57
Annex C: Parameters on received PDUs (or messages, primitives etc.) 62
C.1 Background 62
C.2 Support and status in ICS proforma 62
C.2.1 Transparent parameters 62
C.2.2 Non-transparent parameters 65
History 66

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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Methods for Testing and Specification (MTS), and is now submitted for the ETSI standards Membership Approval Procedure (MAP).

The present document is a revised version of ETR 212 (1995). That ETR was endorsed for mandatory application in ETSI committees by TCR-TR 048 (1996). Upon publication of the present EG, both ETR 212 and TCR-TR 048 will be withdrawn.

Introduction

In the context of the present document, an Implementation Conformance Statement (ICS) proforma is a document in the form of a questionnaire, part of a telecommunication specification (e.g. protocol, interface, telecommunication service). It needs to be filled in by the supplier of an implementation, and when completed, becomes an ICS. The objective of the ICS is to provide a statement of which capabilities and options of the telecommunication specification have been implemented. The ICS is used in two contexts:

- for conformance testing purposes: it is mainly used to check the static conformance of the implementation, and to select and parameterize the tests;
- outside the conformance testing context: it is used to provide information on the capabilities supported by the implementation - as an identity card, in order for example, to have an idea of the chances of interoperability of two implementations.

The questions in an ICS proforma are presented in the form of tables.

EXAMPLE:

Table A.1: Call directions

Item	Call direction	Reference	Status	Support
1	Incoming call	1.1, 5.4.3	m	
2	Outgoing call	1.2, 7.1.2.1	o	

With the following conventions:

- "Incoming call" stands for "Is incoming call supported?";
- "Outgoing call" stands for "Is outgoing call supported?";
- "m" in the status column stands for "it is mandatory to support it";
- "o" in the status column stands for "it is optional to support it";
- the supplier of the implementation needs to answer "Yes" or "No" in the support column.

END of EXAMPLE

ISO/IEC 9646-7 specifies requirements for the development of ICS proforma.

The present document has been developed to harmonize the ICS proforma produced by the different groups in ETSI. The need for harmonizing the styles in ETSI comes from the fact that:

- different styles may confuse the users of standards;
- in order to meet quality criteria such as readability, it is necessary to select notations from those allowed by ISO/IEC 9646-7;
- the ETSI groups developing ICS proforma are generally not very familiar with conformance testing and ICS. A very open standard like ISO/IEC 9646-7 leaves enough options to be confusing. Consequently, the development groups encounter difficulties when trying to decide which notations should be adopted;
- a given ICS proforma, and subsequent versions of it, are generally not produced by the same group of specifiers. Unusual notations may confuse the new specifiers;
- a style harmonization will foster the development of ICS editors and interpreters (tools able to automatically interpret an ICS when parameterizing or selecting test cases, or performing a static conformance review).

The criteria retained for defining a style were the readability for the users, the facility of production and maintenance for the specifiers. Some comments from toolmakers (i.e. tools for editing and interpreting ICS proforma) have also been taken into account.

1 Scope

The present document is intended to be used by specifiers of Implementation Conformance Statement (ICS) proforma. It provides recommendations and practical guidance in order to produce ICS proforma and profile requirement lists. It contains also a template of an ICS proforma specification for a base standard and an example of requirement list for a profile. The present document does not cover Managed Object Conformance Statement (MOCS) proforma.

Within ETSI, ICS proforma are generally produced using Microsoft Word (note). The present document gives specific guidance on its use, in this particular context. The electronic version of the template of a base specification ICS proforma, and the example of a requirement list are available. The electronic version of the template should be used as the physical basis of an actual ICS proforma, with minimum modifications.

NOTE: Microsoft Word is a registered trademark of the Microsoft Corporation.

The present document should be applied in ETSI for the development of new ICS proforma. Existing ICS proforma do not have to be modified in order to comply with the present document.

Moreover, when work is being performed in collaboration with other standardization instances (e.g. at an international level, either in the form of an ETSI profiling activity on a base ICS proforma specification provided by ITU-T or ISO, or in the form of a planned contribution) the present document should be used to the extent necessary to allow compatibility with any practice in use in the concerned group.

2 References

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

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

[2] ISO/IEC 9646-1: "Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[3] ISO/IEC 9646-7: "Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[4] ISO/IEC 9646-3: "Information technology - Open Systems interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".

3 Definitions and abbreviations

3.1 Definitions

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

base specification: A specification of a protocol, telecommunication service, interface, abstract syntax, encoding rules, or information object (see ETS 300 406 [1]).

NOTE 1: A base specification is defined differently to a profile, which constrains optionalities in one or several base specifications.

NOTE 2: The present document does not deal with information objects.

reference specification: A reference specification 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 the ICS proforma and test specifications are written (see ETS 300 406 [1]).

NOTE 3: This definition extends the definition in ETS 300 406 [1], to the specification for which the ICS proforma is written.

implementation: The implementation of the reference specification, which claims to conform to the reference specification (see ISO/IEC 9646-1 [2]).

Implementation Conformance Statement (ICS) proforma: A document, in the form of a questionnaire, designed by the specifier, which when completed for an implementation or system becomes the ICS (see ISO/IEC 9646-1 [2]).

Implementation Conformance Statement (ICS): A statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented. It is a completed ICS proforma. The ICS can take several forms: protocol ICS (PICS), profile ICS, information object ICS (ISO/IEC 9646-1 [2]).

base specification ICS: An ICS related to a base specification. A Protocol Implementation Conformance Statement (PICS) is a particular case of base specification ICS, applied to base specifications of protocols.

ICS template: A template which can be used as the basis for developing an ICS proforma.

NOTE 4: Annex A of the present document contains an ICS template.

3.2 Abbreviations

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

API	Application Programming Interface
ATS	Abstract Test Suite
IUT	Implementation Under Test
ICS	Implementation Conformance Statement
MOCS	Managed Object Conformance Statement
NAF	Network Access Facility
PCI	Programming Communication Interface
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PUF	Programming communication interface User Facility
SCS	System Conformance Statement
SUT	System Under Test
TTCN	Tree and Tabular Combined Notation

4 Prerequisites

The use of the present document to write an ICS proforma assumes some initial knowledge, as indicated below.

Definition of ICS proforma and basic rules

In particular, the present document does not provide the basic concepts of what an ICS proforma is, and the context in which it applies. To obtain this important information, it is strongly recommended that ISO/IEC 9646-1 [2], ISO/IEC 9646-7 [3] and ETS 300 406 [1] (clause 6 and annex A) are read.

Word processor knowledge

Within ETSI, most ICS proforma are written using the Microsoft Word word processor. Because there are many tables in ICS proforma with a lot of cross-references, a knowledge of **the use of sequences and bookmarks in Word is strongly recommended**. The "Help" menu of Microsoft Word provides very useful information concerning their use.

5 Structure of this style guide

This style guide is structured in four parts: the main body, annex A, annex B and annex C.

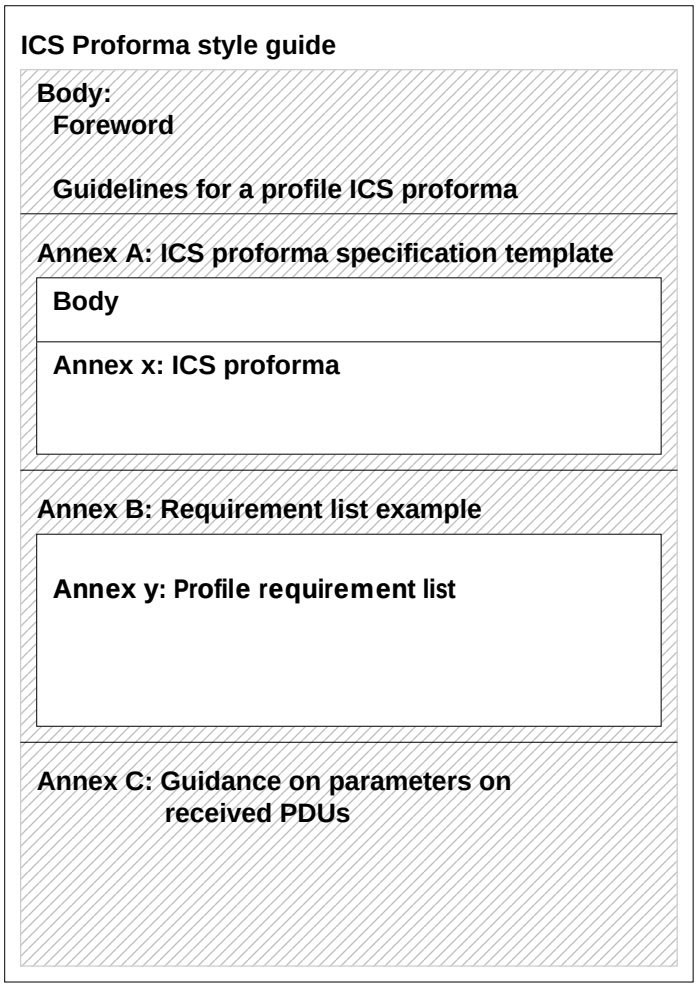
The main body of the style guide provides rules and guidance in order to produce an ICS proforma. All subclauses deal with the production of a base specification ICS proforma, except clause 16 which concerns the profile ICS proforma.

Annex A provides an ICS proforma specification template for a base standard. It is both a demonstration of the application of the guidelines defined in the body of the style guide, and a template which is to be used as a basis for producing an ICS proforma specification for a base standard.

Annex B provides a profile requirement list template. It is a demonstration of the application of the guidelines defined in clause 16. The tables provided may be used as a model for producing a requirement list.

NOTE: Annexes A and B contain text blocks and annexes which are intended to be incorporated into ICS proforma specifications. Both accompany the present document in processable format and are alos available from http://docbox.etsi.fr/editHelp/www/editHelp_intro.htm.

Finally, annex C provides guidance about how to deal with parameters on received Protocol Data Unit (PDU) items.



NOTE: The hatching has no significance other than an editorial means to highlight the structure.

Figure 1: The style guide structure

6 Overview of the ICS proforma production and use

Figure 2 gives an overview of the production and use of an ICS proforma. The rectangles shown on the right of the figure depict the different types of documents dealing with ICS proforma. Each of the nested documents (i.e. rectangles) is part of another one, modified according to a process (i.e. text above the line in the ellipse) executed by an actor (i.e. text below the line in the ellipse). The hatching has no significance, whilst the dotted lines between the different documents highlight the links between them:

- the **ICS proforma specification** is based on the ICS template provided in annex A of the present document, modified by ICS proforma specifiers in ETSI, in compliance with the style guide, ETS 300 406 [1] and ISO/IEC 9646-7 [3];

- the **ICS proforma** provided to the supplier is the ICS proforma presented in an annex of the ICS proforma specification, generally with no modification. Sometimes it may be modified by the test laboratory in conformance with the ICS proforma specification (e.g. change of the language): it is a conforming ICS proforma;

- the **ICS** is the ICS proforma, completed by the supplier of the implementation, in accordance with the instructions provided in the conforming ICS proforma.

NOTE: The supplier is generally not provided with the whole ICS proforma specification, but only with the ICS proforma (i.e. the annex). For this reason, all information necessary to the supplier should be presented in the ICS proforma, and not in the body of the specification.

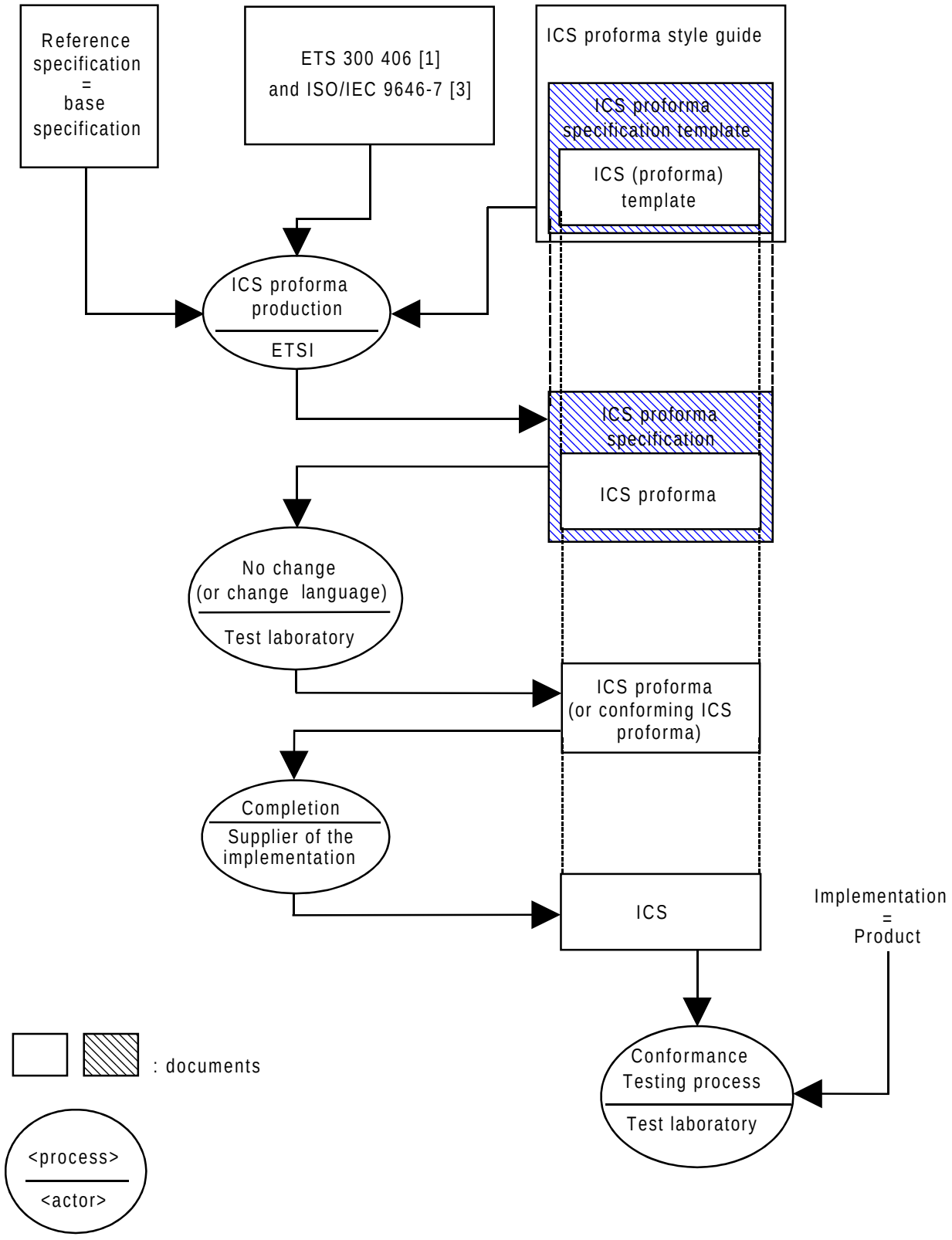


Figure 2: Overview of an ICS proforma production and its use

This style guide applies to the ICS proforma production process.

7 How to write an ICS proforma

According to ISO/IEC 9646-7 [3], an ICS proforma shall be incorporated as an annex in, either:

1) a specific document, which is called an ICS proforma specification;

2) the reference specification itself.

NOTE: In case of a protocol, the ICS proforma specification is called a PICS proforma specification. However, to avoid potential confusion, it is not recommended to create new abbreviations of the form <X>ICS. For example, an ICS for an Application Programming Interface (API) will be an "API ICS" and not an "AICS" (see ISO/IEC 9646-7 [3], subclause 6.2).

7.1 Annex of a specific document called ICS proforma specification

It is strongly recommended that the ICS proforma be an annex to an ICS proforma specification, because information concerning the ICS proforma is concentrated in a dedicated document (and not dispersed as in the case 2 above). It may be applied in two different ways:

- the ICS proforma specification is a part of a multi-part specification - i.e. part of a multi-part standard, one part containing the reference specification. This is the recommended way; or

- the ICS proforma specification is a stand alone specification.

The ICS proforma is normally designed by the reference specification specifiers (e.g. the protocol specifiers). It "belongs" to the reference specification. Even in the case where it is designed by testing specialists, **it shall never be a part of the conformance testing standard** (see ETS 300 406 [1], clause 6).

The present document provides, in annex A, the template of an ICS proforma specification. To create an ICS proforma specification, copy the electronic version of the template into your working document, and follow the instructions below:

- annex "x" needs to be renumbered and the placeholder "x." replaced appropriately (typically by "A.");

- the text provided for guidance of the ICS proforma specifier is in *italics*, and should be removed;

- the text provided in brackets i.e. <wording>, should be replaced by the relevant text in the actual ICS proforma;

- the ICS proforma tables provided as an example should be replaced by the relevant tables, using the same format.

For more details on how to obtain and how to use the electronic version, see clause 14.

7.2 Annex of the reference specification itself

It is not recommended that the ICS proforma is an annex of the reference specification itself, however, when this cannot be avoided, the method described below should be applied.

The first clauses of the template contained in annex A (e.g. clauses such as scope, normative references, etc.) should be re-distributed in the corresponding clauses of the reference specification.

Annex x contained in the template should be copied as the appropriate annex of the reference specification, with the relevant modifications, as indicated in subclause 7.1.

8 General guidelines

This clause provides general guidance for ICS proforma specifiers. It summarizes the most critical rules and recommendations about ICS proforma, mainly extracted from ISO/IEC 9646-7 [3] and ETS 300 406 [1], and adds practical clarification.

8.1 Why this style guide should be followed

From the point of view of an ICS proforma specifier, this style guide should be seen as a means of making the task easier and of producing a good quality ICS proforma.

However, there is often the temptation for a specifier to follow this reasoning about a style guide: "the recommendations of the style guide are nice, but in **my specific case**, I have **specific solutions** which are more appropriate". The following remarks should however be taken into account:

- harmonized solutions cover a lot of cases satisfactorily;
- the interest of specific solutions is often limited;
- even if in some cases, specific solutions may improve the quality of a given ICS proforma, this interest should be weighed against the fact that, as stated in the introduction, it is essential to harmonize the styles of the ICS proforma produced by ETSI. As a consequence, the use of the common notations is a very important quality criterion for an ICS proforma. The adoption of these common notations is essential to achieve good quality.

8.2 Which questions and how to structure them

The purpose of an ICS proforma is to ask questions. Thus, the most important - and delicate - task of an ICS proforma specifier is to identify which questions are relevant, and which ones are not. This task is quite difficult, it requires a lot of concentration and a good knowledge of the reference specification and of its practical use. It is particularly true when the text of the reference specification is itself ambiguous or poorly structured.

Producing an ICS proforma should not be seen as a systematic task. The question definition process should **not** be reduced to examining the table of contents of the reference specification, in order to identify the "major capability" items (one entry in the table of contents = one question). Similarly, neither should it result in a systematic search of all "shall" to identify the mandatory capabilities and all "may" to identify the optional capabilities which should appear in the ICS proforma.

8.2.1 Meaningful, unambiguous and useful questions

Meaningful questions

The first point, which seems obvious but not always achieved, is that all the questions should be meaningful, and should have one and only one meaning (i.e. no "double question"). For each question, each item that an ICS proforma specifier defines, he/she should consider "if I was the supplier of an implementation, and if I had to answer this question, would I understand it? Would I be able to answer it"? If the answer is no, it means that the item need to be reworded, or simply be deleted: it is better to have no item than to have an item which has no meaning.

As stated before, to systematically extract the questions from a heading title of the reference specification is not a good method of defining adequate questions. The consequence of such practice is to provide meaningless questions.

EXAMPLE: **Text in the reference specification:**

"7.3 Procedure associated with access negotiation

In order to initiate an access negotiation, ACCESS PDU, containing a ACC_IDENT parameter, shall be sent. The initiation of an access negotiation is an optional feature.

On receiving a request for access negotiation, an implementation which does not support the feature shall discard the ACCESS PDU. On receiving a request for access negotiation, an implementation which supports the feature shall send an ACCESS_ACK PDU to the distant entity."

ICS proforma questions:

The question "Is procedure associated with access negotiation supported?" should not appear. Indeed, what would be the meaning of such an item? Would it mean "Is the implementation able to initiate the feature?" or "Is the implementation able to interpret the request" or " Does the implementation support both (i.e. initiation and interpretation of the request)?". What should be the answer of a supplier whose implementation supports only the request and is not able to initiate the feature? Moreover, the procedure describes the behaviour to follow in case of non-support of the capability "interpretation of an access negotiation". If an implementation does not support the access negotiation request and reacts as described in the procedure, does it mean that the supplier should answer YES to the question?

Clearly, having only one question concerning the whole procedure is not the correct approach. Two different questions, reflecting the real capability, are necessary: "Is initiation of an access negotiation supported?" and "Is the interpretation of an access negotiation request supported?" A question concerning the behaviour in case of "non-support' of an access negotiation request is not useful.

NOTE: Guidance concerning the status of an item is given in subclause 8.3.

Useful questions

It is difficult to give a generic definition of what a "useful" question is. It depends on each specific case. However some general guidance may be given: a useful question is a question which is in line with the objective of an ICS. As stated in the introduction, the aims of an ICS are to give information for the purposes of conformance testing (i.e. static conformance review, selection and parameterization of tests), and to provide a kind of "identity card" of the implementation (e.g. used for interoperability checking). There is a conflict between these different purposes: for the purpose of the static conformance review, it is necessary to list mandatory capabilities, in order to check if the implementation supports them. For the other purposes (i.e. tests selection and parameterization, interoperability checking), it is important to concentrate on the optional capabilities, in order to know which ones are implemented.

The objective of the ICS proforma specifier is to find a balance between these different purposes, and to be able to identify which questions are useful, and which ones are not. The next subclause gives some guidelines on the matter.

Most importantly, ICS specifiers are required to avoid producing countless tables with useless questions which will confuse and bore the supplier who is required to complete them. The ICS specifier should be concerned about the person who is required to complete the ICS proforma and interpret the ICS. The tables produced should be useful and meaningful, in order to make the best possible use of the ICS proforma.

8.2.2 No dynamic requirements

The ICS questions shall be static conformance requirements from the reference standard. Dynamic questions shall not appear in the ICS proforma (see ETS 300 406 [1], clause A.1).

Static requirements can be interpreted as:

- WHAT are the requirements to conform with?
- WHAT are the mandatory capabilities to be implemented?

EXAMPLE 1: Main capabilities (e.g. incoming call, outgoing call), PDUs (e.g. Setup, Disconnect), parameters in PDUs (e.g. CalledAddress in Setup sent, Cause in Release received).

Dynamic requirements can be interpreted as:

- HOW is a requirement implemented?
- HOW is a capability achieved, what is the sequence of commands and actions?

EXAMPLE 2: This is a dynamic requirement (**which should NEVER appear in an ICS proforma**):

Does the implementation send a ConnectRsp after receipt of a ConnectReq?

8.2.3 Structure and level of detail

As stated in ISO/IEC 9646-7 [3], an ICS proforma shall be structured in a hierarchical manner, from general to more detailed questions. For a protocol, the structure should be (adaptation is permissible to fit each particular protocol):

- roles;
- major capabilities;
- PDUs;
- PDU parameters;
- timers;
- negotiation capabilities;
- protocol error handling;
- multi-specification dependencies;
- other conditions.

For more details, in particular about the level of detail to go to, refer to ETS 300 406 [1], clause A.2 and ISO/IEC 9646-7 [3] subclause 8.5.

It has been found that some ICS proforma do not manage the level of detail of **PDU parameters** in an appropriate way. The rest of this subclause gives some guidance on this critical point.

The two most frequent mistakes are:

1) confusion between dynamic presence of a parameter and static capability to support it;
2) global questions dealing with the parameter instead of separating all cases (i.e. parameter in all possible PDUs, in sending and receiving direction).

No dynamic presence but static capability

As stated previously, an ICS proforma should not reflect dynamic conformance requirements but static ones. In particular, an ICS question about the support of a PDU parameter does not reflect requirements about the syntax of the PDU (i.e. the presence of a parameter) but the capability of the implementation to support the parameter. In the sending direction, the support of a parameter means that the implementation is able to send this parameter (but it does not mean that the implementation always sends it). In the receiving direction, it means that the implementation supports the whole semantic of the parameter (for more details, refer to annex C).

As a consequence, PDU parameter tables in a PICS proforma should not be the same as the tables describing the syntax of a PDU in the reference specification. It is not rare to see a parameter which is optional in the syntax but mandatory in the ICS proforma. A typical example is given in subclause 8.3.1.

No global questions

PICS items should not reflect the capability to support the parameter globally, but should differentiate between the capability to support the parameter in each PDU, and in each direction (i.e. send/receive). A question such as "Does the implementation support the parameter "reason"?" has no meaning. Several questions need to be asked: "Does the implementation support the sending of parameter "reason" in PDU Connect?" and "Does the implementation support the receipt of parameter "reason" in PDU Connect?".

There are two main reasons which may explain this bad choice of ICS specifiers:

- it was not appropriate to reach this level of detail in the context of the specific protocol. The ICS specifiers did not "feel" the usefulness of such items, and only provided PDU parameter tables because they thought that the methodology required it. They chose a compromise which is in fact confusing;

- it was appropriate to provide PDU parameter tables (the most common case), but the ICS specifiers chose this solution because of a lack of resource: to deal properly with PDU parameters requires a lot of time. The ICS specifier attempted to reduce the number of tables, (and consequently the resource needed) by combining several questions into one, which is not a good solution.

In fact, send and receive cases need to be managed separately. If there is a problem of resource, it is better to completely eliminate a level of detail. rather than to provide meaningless tables. As stated before, it is better (less confusing) to have no item, rather than to have a meaningless item. However, it does not mean that it is recommended to omit PDU parameter tables. On the contrary, they are often very useful for the tests selection and interoperability checking.

NOTE: It may happen that a PDU parameter is used on the same PDU with different semantics, in order to implement several functionalities. For such parameters, it may be clearer to have a distinct PICS question for each semantic of the parameter in the PDU.

8.3 How to choose a status

One of the most delicate tasks of an ICS proforma specifier, after having identified the capabilities for which a question is useful, is to select an adequate value for the status of this capability. One of the difficulties arises from the fact that the reference specification itself is often ambiguous, and does not indicate directly if the implementation of a feature is mandatory, conditional or optional. Very often, the support of a (static) feature needs to be deduced from a dynamic description in the reference specification.

NOTE: The ICS proforma cannot add conformance requirements to the reference specification. Examples, elaborated in ISO/IEC 9646-7 [3] subclause 9.2 are given below.

Contrary to the examples however, the status of an item is often not determined by only one "sentence" in the reference specification. For example, to find the status of a parameter in a PDU, it is necessary to check all sections which contain a requirement related to this parameter. This point is illustrated in the following examples.

The different possibilities for the status are given in subclauses 8.3.1 to 8.3.7.

8.3.1 m: mandatory

m: Mandatory - the capability shall be supported.

It is a static view of the fact that the conformance requirements related to the capability in the reference specification are mandatory requirements.

This does not mean that a given behaviour shall always be observed (this would be a dynamic view), but that it shall be observed when the implementation is placed in conditions where the conformance requirements from the reference specification compel it to do so.

For instance, if the support for a parameter in a sent PDU is mandatory, it does not mean that it shall always be present, but that it shall be present according to the description of the behaviour in the reference specification (dynamic conformance requirement).

EXAMPLE 1: Sentence in the reference specification:

"The parameter *CalledAddress* shall be provided by the user in the Connect PDU if it was provided by the network."

ICS proforma item:

Support of *CalledAddress* parameter in the Connect PDU sent by the user.

ICS proforma status:

This is an example of a situation where the ICS specifier has to deduce the static status of a feature (i.e. the support of a parameter) from the dynamic description in the reference specification. The ICS specifier may reason as follows: "There are cases where an implementation is obliged to send the parameter. These cases do not depend on the support of other features of the reference specification (it depends on the network behaviour). Thus the status is mandatory".

EXAMPLE 2: Sentence in the reference specification:

"The parameter *CalledAddress* in the Connect sent PDU shall always be provided."

ICS proforma item:

Support of *CalledAddress* parameter in the Connect PDU sent.

ICS proforma status:

"mandatory".

8.3.2 o: optional

o: Optional - the capability may or may not be supported. It is an implementation choice.

EXAMPLE: Sentence in the reference specification:

"It is allowed to provide or to not provide the parameter *CalledAddress* in the Connect PDU."

ICS proforma item:

Support of *CalledAddress* parameter in the Connect PDU sent.

ICS proforma status:

"optional".

8.3.3 n/a: not applicable

n/a: Not applicable - it is impossible to use the capability. No answer in the support column is required.

EXAMPLE: Sentence in the reference specification:

"The parameter *CalledAddress* in the Connect PDU is only sent by the network side, to a user destination. It is never sent to another network."

ICS proforma item:

Support by the network of *CalledAddress* parameter in the Connect received PDU.

ICS proforma status:

"n/a".

8.3.4 x: prohibited (excluded)

x: Prohibited (excluded) - It is not allowed to use the capability. This is more common for a profile.

EXAMPLE: Sentence in the reference specification:

"The parameter *Status* in the Connect PDU is only sent by the network side. It is not allowed for the user to send this parameter"

ICS proforma item:

Support by the user of *Status* parameter in the Connect sent PDU.

ICS proforma status:

"x".

NOTE: It is unlikely that the status is unconditionally not applicable or prohibited, but this is quite possible if there are several questions in the same row of a table (i.e. several sets of supports and status columns, one set for each different transmission direction (sending/receiving) or classes etc.).

8.3.5 c <integer>: conditional

c<integer>: Conditional - the requirement on the capability ("m", "o", "n/a" or "x") depends on the support of other **optional or conditional** items. <integer> is the identifier of the conditional expression.

EXAMPLE: Sentences in the reference specification:

"The procedures related to the initiation of an outgoing call are an optional part of this specification" and later "Sending a Connect PDU is the only way to initiate an outgoing call. This PDU is only sent to initiate an outgoing call".

ICS proforma item:

Capability to send a Connect PDU.

ICS proforma status:

"c1". c1 is the identifier of the following conditional expression (for the purpose of this example, it does not exactly follow the recommended syntax):

IF "outgoing call supported" THEN m ELSE n/a.

NOTE: In this example, if "outgoing call" was a mandatory capability, the status of "capability to send a Connect PDU" would not be conditional, but mandatory.

For more details about conditional items, refer to clause 11.

8.3.6 o.<integer>: qualified optional

o.<integer> Qualified optional - for mutually exclusive or selectable options from a set. <integer> is the identifier of the group of options, and the logic of selection of the options.

EXAMPLE 1: Sentence in the reference specification:

"To indicate that the numbering is completed, two options exist:

- add the "*" character at the end of the numbering;
- add the "#" character at the end of the numbering."

ICS proforma items:

Indication of the numbering completion using "*".

Indication of the numbering completion using "#".

ICS proforma status of both items:

"o.1: It is mandatory to support at least one of these options".

The status and the logic of the option should reflect a static and not a dynamic requirement:

EXAMPLE 2: Sentence in the reference specification:

"It is mandatory for an implementation to be able to clear a call. (...) To clear a call, procedure 1 or procedure 2 may be used."

ICS proforma items:

procedure 1.

procedure 2.

ICS proforma status of both items:

"o.1: It is mandatory to support **at least one** of these options".

In example 2, the reference specification does not require that the same option is chosen for all call clearings. Thus, the too restrictive requirement "It is mandatory to support exactly one of these options" should not be used in this case. Even if both procedures may not be active at the same time (dynamic requirement), it is conformant to choose procedure 1 for some calls, and procedure 2 for others.

For more details about qualified optional items, refer to clause 12.

8.3.7 i: irrelevant

i irrelevant - capability outside the scope of the given specification. Normally, this notation should be used in a base specification ICS proforma only for transparent parameters in received PDUs (refer to annex C). However, it may be useful in other cases, when the base specification is in fact based on another standard.

8.4 How to deal with two main roles

Some reference specifications can be implemented in different roles (e.g. user/network, Programming Communication Interface User Facility (PUF)/Network Access Facility (NAF), initiator/responder). The choice of the ICS structure mainly depends on whether it is likely that an implementation will support only one role. In that case, it is recommended to structure the ICS proforma in two different parts, two different subclauses, each one dealing with one role. The suppliers of the implementations of the two roles are often different, belonging to different disciplines. Thus it is preferable not to complicate ICS proforma tables with the requirements of both roles.

It is recommended to structure the subclause "ICS proforma tables" of the ICS proforma as follows:

- a first table containing items to identify which roles have been implemented;
- a subclause containing tables for the first role;
- a subclause containing tables for the second role.

It should be explicitly indicated that the supplier of the implementation is required to fill in only the subclauses concerning the roles implemented, using a prerequisite line (refer to subclause 11.3). An example is provided in the template for a base specification ICS (annex A).

NOTE: The supplier of ICS interpreters needs to take into account the fact that, in this case, the tables of subclauses relating to the role not implemented will not be completed. It should not be interpreted as an error during the static conformance review.

9 Guidelines on ICS proforma tables

As previously stated and according to ISO/IEC 9646-7 [3], ICS proforma items are grouped into tables, such as:

EXAMPLE:

Table A.3: <Table title>

Item	<Item description>	Reference	Status	Support	Values	
					Allowed	Supported
1						
2						
3						
4						

Comments:

END of EXAMPLE

In an actual ICS proforma, the tables are grouped into clauses and subclauses following a hierarchical structure, from general questions to detailed ones (refer to subclause 8.2.3). Each subclause may contain one or several tables. It is recommended to accompany the tables with specific explanations when deemed useful. Explanatory text, if any, should appear before the table to which it relates.

To structure items in a subclause, it is recommended to create several tables, each table dealing with a specific issue. The tables should not contain too many items (20 items should be a maximum). It will limit the re-numbering problem in case of the addition of an item. It will also ease the maintenance (refer to clause 15), because it will be more sensible to add an item at the end (all the items belong to the same topic).

To allow the supplier to provide conditional answers or comments, space is provided at the bottom of the tables, after the possible conditional or optional expressions.

There may be several sets of columns for reference, status, support, values allowed and values supported. This notation is just an editing means to ask several questions in one table row. Classic examples of the use of this notation are tables dealing with receiving and sending directions for a PDU in the same row. This is illustrated in subclause 9.2 (table types 2 and 4).

NOTE: The reference, status and support columns should be considered as a set. If a row deals with several questions each one should have its own status. The three columns should be duplicated: for each question there being one support, one status and one reference column.

9.1 Table columns

All the possibilities of columns are presented later in the document. No other type of columns should be used. In particular, no predicate column or merged status/predicates column should be used.

All tables should contain at least these columns: item, item description, reference, status, support.

All table cells should be completed by the ICS proforma specifier, except the support and supported values columns, which need to be completed by the supplier of the implementation.

If deemed useful, it is possible to provide a comment in all types of cells, using a note provided at the bottom of the table. It may be used, for example, for providing an explanation about the status. It is used, in particular, for the received PDU parameters status (refer to annex C).

Item column

The item column contains an integer which identifies the item in the table. The first item of each table is "1". The numbering should be in whole integers: "1, 2, 3, 4 ..." (not "1, 1.2 , 1.3 ...").

NOTE 1: This is a restriction of ISO/IEC 9646-7 [3].

A consequence is that the use of implicit conditionals is discouraged. However, in some cases (e.g. tables dealing with complex data structures) the notation "conditions implied by nested item numbering" may be used. For more details, refer to ISO/IEC 9646-7 [3], subclause 9.2.5.5.

Item description column

The item description column describes each respective item. The header of this column should be meaningful, such as "Service", "Call direction", "PDU parameter" etc., and should not be only "item description" or "feature".

In each row, the item description is just the name of a capability (e.g. "File directory service"), and implies the question "Does the implementation support <capability name>?" (e.g. "Does the implementation support the file directory service?"). It is not recommended to write the question in full.

Reference column

The reference column contains the references to the appropriate clauses (generally of a single reference specification), which were used to determine the status of the question. This is why, in the case of several questions in the same row, there is a requirement for a reference column per status column (i.e. per question). It is essential to justify the value of the status, by providing **all references** of clauses which were used to determine it.

NOTE 2: When this column contains a reference to a single reference specification standard, it is not necessary to state it explicitly (i.e. [..] is not necessary).

Status column

The status column specifies the status value for the item (e.g. mandatory, optional, conditional), reflecting what the support should be for conformance. Refer to subclause 8.3 "How to choose a status" for more details.

Support column

The support column will contain the answer made by the supplier of the implementation to indicate whether or not the implementation supports the item.

The possible answers are Yes, No, N/A (N/A can only be used if the status is N/A).

As a restriction of ISO/IEC 9646-7 [3], tick boxes are not recommended, for several reasons:

- they add no useful information;
- their semantic is ambiguous: are only the conformant answers indicated or not?
- if they are managed in a consistent manner (in accordance with the status value), they are extra work for the ICS specifier;
- they are not convenient for the supplier to give conditional answers;
- to complete an ICS proforma is a delicate task, which needs time and concentration. It should not be seen as filling in a quiz.

If the ICS proforma is completed in order to describe a multiple-profile support in a system, it is necessary to be able to answer that a capability is supported for one profile and not supported for another. In that case, the supplier shall enter the unique reference to a conditional expression, preceded by "?" (e.g. ?3). This expression is defined below the table, in space provided. It uses predicates defined in the System Conformance Statement (SCS), each of which refers to a single profile, and which takes the value TRUE, if and only if, that profile is to be used.

EXAMPLE: ?3: IF prof1 THEN Y ELSE N

Values allowed column

This column contains the values, the ranges of values, the type or the length allowed by the reference specification.

Note that the status value is linked to the support of the capability indicated in the item description column, and not to the values allowed column. As stated in ETS 300 406 [1] clause A.3 and ISO/IEC 9646-7 [3], if, within the list of values, some values are mandatory while others are optional or conditional, then an extra table is required, listing each category of parameters with their status. An application of this rule is presented in the ICS template in annex A of this style guide. If no extra table is provided, this means that all values are optional.

The syntax to follow in this column is presented in clause 13.

No question about default value should appear. The meaning of such questions is often ambiguous and relates to a "dynamic" requirement. Thus questions about default values are irrelevant in an ICS proforma.

Values supported column

The values supported column will contain the answer made by the supplier of the implementation to indicate which values are supported by the implementation.

No mnemonic column

There should be no mnemonic column. However, in the case where the use of mnemonic identifiers is found suitable, the mnemonic should be indicated in the item description column. They shall never be used alone to refer to an item (e.g. in a conditional expression), because this makes it almost impossible to locate the ICS table referred to (see ETS 300 406 [1]). They may be used as an additional information to the numerical item reference (refer to clause 10), provided as a comment.

9.2 Table types

All tables of an ICS proforma should be in accordance with one of the four table types specified below. For each type, an empty model is presented, with an example to assist understanding. The column widths may be changed, but in that case, it should be done for all tables of the given type, in order to achieve a certain consistency in the style of the whole ICS proforma.

When specifying an ICS proforma, one of the keys to success is "simplicity". For this reason it is recommended to use simple table types, even if it will increase the number of pages of the proforma. Generally, complexity is not a consequence of the length of a document. On the contrary, complexity comes often from the fact that the document is too dense, too compact, too contrived. Often, a good way to make things more simple is to split and to structure the document. As a consequence, the less complicated table (i.e. type 1) should be widely used. **The most complicated one (i.e. type 4) should be chosen only if it is absolutely required**.

type 1: (recommended)

EMPTY MODEL:

Table A.1: <wording>

Item	<Item description>	Reference	Status	Support
1				
2				
3				
4				

EXAMPLE 1:

Table A.1: Service elements

Item	Service	Reference	Status	Support
1	T_ASSOCIATE	4.1, 6.7, 4.5	o	
2	T_RELEASE	4.2, 6.7, 4.5	m	
3	T_U_ABORT	4.3, 6.7, 4.5	o	

type 2:

EMPTY MODEL:

Table A.1: <wording>

Item	<Item description>	<context1>			<context2>		
		Reference	Status	Support	Reference	Status	Support
1							
2							
3							
4							

EXAMPLE 2:

Table A.1: class 1 PDUs

Item	PDU	Sending			Receiving		
		Reference	Status	Support	Reference	Status	Support
1	Connect	1.4	o		1.6	m	
2	Release	1.5	m		1.9	m	

type 3:

EMPTY MODEL:

Table A.1: <wording>

Item	<Item description>	Reference	Status	Support	Values	
					Allowed	Supported
1						
2						
3						
4						

EXAMPLE 3:

Table A.1: Transfer PDU

Item	Parameter	Reference	Status	Support	Values	
					Allowed	Supported
1	Reason	5.6, 7.8, 2.1	o		'22'H, '23'H	
2	Function	3.1	o		1 .. 6	
3	Size	3.2, 6.7	m		0 .. 256	
4	TransferMode	1.1	m		basic (1) not basic (2)	
5	Recovery	1.3, 4.3, 6.7	o		recov (0) not rec (1)	
6	LifeTime	3.4.5, 4.2.7	o		1 .. 24 --sec	

type 4:

It is recommended not to use this type of table, unless absolutely required, as this type of table is complex and difficult to read. It is recommended to split it into two tables, each one dealing with a context.

EMPTY MODEL:

Table A.1: <wording>

Item	<Item description>	<context1>					<context2>				
		Reference	Status	Support	Values		Reference	Status	Support	Values	
					Allowed	Supported				Allowed	Supported
1											
2											
3											
4											

EXAMPLE 4:

Table A.1: Response parameters

Item	Parameter	Sending					Receiving				
		Reference	Status	Support	Values		Reference	Status	Support	Values	
					Allowed	Supported				Allowed	Supported
1	Reason	3.1	o		'22'H		4.5, 5.7.6	m		'22'H, '23'H	
2	Function	3.3	o		1 .. 4		6.8.6.5, 1.2	m		1 .. 6	

10 Guidelines on references to items

For each possible item answer (answer in the support column) within the ICS proforma, a unique reference exists. It is used, for example, in the conditional expressions in the ICS proforma, or in the selection expressions of test cases in the abstract test suite (ATS). As defined in ISO/IEC 9646-7 [3], the item reference is defined as the table identifier, followed by a solidus character "/", followed by the item number in the table. If there is more than one support column in a table, the columns shall be discriminated by letters (a, b, etc.), respectively.

EXAMPLE 1: A.5/4 is the reference to the answer of item 4 in table 5 of annex A.

EXAMPLE 2: A.6/3b is the reference to the second answer (i.e. in the second support column) of item 3 in table 6 of annex A.

11 Guidelines on conditional items

Conditional items are items whose status value depends on the support of another item, optional or conditional itself (refer to subclause 8.3).

To reflect such a requirement, a conditional expression notation should be used. The predicate column notation is not recommended because:

- in case of a complex predicate expression, the table becomes unreadable;
- for a given item, all predicate expressions are required to be mutually exclusive. When the predicate expression is complicated, it is not easy to define mutually exclusive expressions. With the conditional expressions, the possibility of using "ELSE" branches makes things easier.

For the sake of consistency of the ICS proforma tables, the two possibilities (i.e. predicate column for simple expression and conditional expressions for complex ones) should not both be used in the same proforma. Conditional expressions are readable in all cases (i.e. simple or complex expressions): this style guide therefore recommends the use of conditional notation.

The next table is an example of the use of conditional expressions to deal with conditional items:

EXAMPLE:

Table A.6: ConnectAck sent parameters

Item	Parameter	Reference	Status	Support
1	RespNumber	4.5	c601	
2	Display	4.6	c602	

c601: IF (A.3/2 AND A.3/1) THEN m ELSE n/a -- Connect and Release
c602: IF (A.3/2 OR A.3/1) THEN o ELSE n/a -- Connect or Release

The condition number (in this example "601") identifies a unique conditional expression. It is recommended that the conditional expression be defined immediately following the table, in order to ease readability. However, if the same condition applies to many items of several tables (i.e. a global condition), it is possible to define the conditional expression once, at the end of the ICS proforma in a "global conditions and predicates" subclause.

The numbering rule for the condition number in both cases is presented in the next subclause.

11.1 Condition number

This number shall be unique in all the ICS proforma. It allows identification of a unique conditional expression.

The condition number is an integer containing 2 fields:

<table number><number in the table>.

- <table number>: is the number of the table in which the condition appears.
- <number in the table>: is a unique reference of the condition in the table, of **2 digits**. It has no order meaning.

EXAMPLE 1: c2101 is the conditional expression "1" of table A.21.

EXAMPLE 2: c211 is the conditional expression "11" of table A.2.

If the conditional expression is not local to one table, but applies to several tables the numbering rule is:

- <table number>: "0"
- <number in the table: 2 digits

EXAMPLE 3: c011 is the global condition number 11.

11.2 Conditional expression

Conditional expressions use the syntax: IF <predicate expression> THEN ... ELSE ...

The predicate expression is a Boolean expression following the TTCN syntax (refer to ISO/IEC 9646-3 [4]), where the predicates are item references (refer to clause 10) or, only if necessary, names of predicate expressions defined at the end of the ICS proforma, in a "global conditions and predicates" subclause.

Conditional expressions should be written taking due account of the need for readability, with a wide use of brackets and "tabs" to align the different branches of complicated expressions.

All branches of the expression should be explicitly defined (i.e. no implicit "ELSE n/a").

It is recommended to provide meaningful comments, preceded by "--". These may be the Boolean expressions containing the items appropriately and meaningfully "translated".

EXAMPLES:

```
c501:  IF A.3/1 THEN m ELSE n/a              -- Connect

c401:  IF A.3/4 OR (A.2/5 AND A.3/8)         -- ConnectAck or (Release and ReleaseAck)
       THEN m
       ELSE (IF A.4/6 THEN o ELSE n/a)       -- Incoming call

c402:  IF A.2/4 AND (A2/5 AND (A.2/8 OR NOT A.2/9 OR A.2/3 OR A.2/2) OR (NOT A.2/1 AND A.2/7))
       THEN m ELSE o
```

11.3 Predicate applying to a whole clause or a whole table

If a whole table or all the tables of an entire clause/subclause are not applicable because some capabilities are not supported, readability is improved by a global indication that it is not required to answer the related questions, instead of using a condition for each item. In that case a prerequisite line may be used. This prerequisite line is written just below the title of the table or the clause to which it applies.

NOTE: This is an extension of ISO/IEC 9646-7 [3] subclause 9.2.5.6, to a whole clause/subclause.

This approach is useful, for example, for a PDU parameter table that is applicable only if the PDU is supported.

EXAMPLE 1:

Table A.1: ConnectAck parameters

Prerequisite: A.3/2 -- ConnectAck

Item	Parameter	Sending			Receiving		
		Reference	Status	Support	Reference	Status	Support
1	RespNumber	4.3, 7.3.2, 9.1	m		4.7	m	
2	Display	4.3, 7.3.2, 9.1	o		4.7	m	

It is also useful for a clause dealing with a particular role.

EXAMPLE 2: **A.4.3 User role**

Prerequisite: A.1/1 -- User role

A.3.1 Major capabilities

etc.

12 Guidelines on qualified optional items

Qualified optional items allow the definition of selectable options among a set, using the notation o.<integer> (refer to subclause 8.3).

EXAMPLE:

Table A.2: Call directions

Item	Call direction	Reference	Status	Support
1	incoming call	1.2, 4.6	o.2	
2	outgoing call	1.4, 4.7	o.2	

o.2: It is mandatory to support at least one of these items.

The recommended wording for the most common requirements is given in ISO/IEC 9646-7 [3]:

- "It is mandatory to support at least one of these options";
- "It is mandatory to support exactly one of these options".

However, other requirements are possible, for example: "It is mandatory to support exactly 3 of these 5 options".

NOTE: When the word "options" is not found suitable, it may be replaced by "items".

When the group of optional items belong to the same table, the logic is defined below the table. Otherwise, it should be defined at the end of the ICS proforma. In that case, the references to items which belong to the set of options should be indicated, as a comment.

As stated in ISO/IEC 9646-7 [3], each new integer identifies a new group of items of the ICS proforma, and does not only identify the logic of the option. For more details, refer to ETS 300 406 [1], clause A.5.

This integer cannot be structured in the same manner as condition numbers (i.e. <table number><number in the table>), because the items may belong to different tables. Thus it follows a sequential numbering over the entire ICS proforma (1, 2, 3, 4, etc.).

13 Guidelines on allowed values column syntax

This column contains the list of values, their ranges, the type or the length allowed by the reference specification. The syntax used is derived from ASN.1 to ease the recopying of information contained in the reference standard, if that reference standard uses ASN.1.

Syntax for:

- range of values: <min value> .. <max value>
  example: 5 .. 20

- list of values: <value1>, <value2>, ..., <valueN>
  example: 2 ,4 ,6 ,8, 9
  example: '1101'B, '1011'B, '1111'B
  example: '0A'H, '34'H, '2F'H

- list of named values: <name1>(<val1>), <name2>(<val2>), ..., <nameN>(<valN>)
  example: reject(1), accept(2)

- length: size (<min size> .. <max size>)
  example: size (1 .. 8)

The unit of measure depends on type of the parameter:

example: bit string ⇒ unit is bit
example: octet string ⇒ unit is octet

If it seems useful to give additional information, it should be done using the format: -- <comment>.

For example, in the case of a range or a list of values, a unit of measurement may be added. The next table illustrates the syntax for an allowed values column.

Table A.1: parameters of Operation PDU sent

Item	Parameter	Reference	Status	Support	Values	
					Allowed	Supported
1	LifeTime				1, 2, 5, 8 -- sec	
2	Rate				3..9	
3	Info1				'111'B, '101'B, '110'B	
4	Info2				size (1 .. 8)	
5	OpType				basic(1), prim(2), new(4)	

14 Guidelines on the use Microsoft Word

Within ETSI, ICS proforma should be written using the Microsoft Word word processor. One of the most critical aspects is that an ICS proforma contains many tables with many cross-references. This clause provides guidance on the use of Microsoft Word to produce ICS proforma. However, **it supposes a knowledge of the use of sequences and bookmarks.**

14.1 How to use the electronic version of the template

To ease the production of ICS proforma, the electronic version of the template contained in annex A accompanies the present document. It is also available from http://docbox.etsi.fr/editHelp/www/editHelp_intro.htm.

The ICS proforma template should be used as a basis for producing actual ICS proforma, with the minimum set of modifications. It eases the task of ICS proforma specifiers, and harmonizes the ICS proforma produced.

What to do?

- get the electronic version of the template;
- renumber appropriately the annex (annex "x") which is contained in the template;
- leave the normal text as it is, but replace "<wording>" with text specific to the actual ICS proforma, and follow the explanations and recommendations in *italics*;
- replace the ICS proforma tables which are provided as an example, by the relevant tables;
- remove the text in *italics*.

Tables provided in the template (tables of the example or empty models) should be copied, pasted and modified in order to use the recommended format. However, if Microsoft Word version 2.0c or earlier is used, it is recommended to use the following method in order to copy a table containing bookmarks without losing the bookmarks in the original:

- copy the table;
- paste it **above** the original table (the bookmarks followed the pasted table);
- cut the original table (below the one just inserted), it contains no bookmarks;
- paste it in the appropriate clause.

These instructions need to be followed exactly, because when a text with bookmarks is copied and pasted, the bookmarks will disappear from the initial text and follow the pasted text. By following the previous method, the bookmarks will stay at the original location, and the new text contains no bookmark.

NOTE 1: This behaviour is corrected in Microsoft Word version 6.0a and later.

Maintenance aspects

As stated in clause 15 on maintenance aspects, the table identifiers and item numbers should not be changed after publication of the document, because some other documents will refer to them (e.g. ATS, RL). For this reason, the sequences and bookmarks used in the tables should be "hard coded" just before the publication, during the final editing phase. **It should not be done before,** because if a defect is detected before (e.g. a table is missing), the sequences and bookmarks should be still there in order to ease the correction.

NOTE 2: "Hard coding" of the ICS proforma tables is normally only carried out by the publishing editor in the ETSI Secretariat.

14.2 How to use sequences and bookmarks in ICS proforma tables

Sequences and bookmarks are useful during the production phase of an ICS proforma. They avoid tedious updating of the numbering, in case of the addition or the suppression of a table. However, to avoid unnecessary complexity, the use of sequences and bookmarks should be limited to cases where it is helpful. Excessive use of sequences and bookmarks in a document make it too complex to be managed by the ICS proforma specifier, and the limits of Microsoft Word may be quickly reached.

14.2.1 Table and item numbers

The table numbers are generated using a sequence field named "tab".

The item numbers are generated using a sequence field named "item" and reset to one in the first row of each table.

EXAMPLE:

Table A.{seq tab}: Call directions

Item	Call direction	Reference	Status	Support
{seq item \r1}	incoming call	1.2, 4.6	m	
{seq item}	outgoing call	1.4, 4.7	m	

14.2.2 Conditional items

Two aspects have to be considered: the condition number (i.e. c102), and the conditional expression.

Condition number

For a local condition number (i.e. c<table number><number in the table>):

- the <table number> part is generated using the feature "insertion of the closest sequence number" (i.e. {seq tab \c});
- because there is no order notion for the <number in the table>, this number does not need to be updated if a new condition is added. Thus it is not recommended to use a sequence to generate it.

EXAMPLE 1: c{seq tab \c}03

Conditional expression

As stated in clause 10, item references used as predicates in the conditional expressions follow the notation: A.<table number>/<number in the table>.

<table number> is generated automatically, using a bookmark on the table number. <number in the table> should be managed manually, because the use of bookmarks would result in too large a number of bookmarks which are difficult to manage and increase the size of the file. Moreover, the number in the table is more stable than the table number.

The naming rule for bookmarks on tables is "tab_<meaningful wording>".

EXAMPLE 2: A bookmark called "tab_Calldir" is created on **{seq tab}** of the Call directions table.

Table A.{seq tab}: Call directions

Item	Call direction	Reference	Status	Support
{seq item \r1}	incoming call	1.2, 4.6	o	
{seq item}	outgoing call	1.4, 4.7	o	

This bookmark is used in the reference to items 1 and 2 (incoming and outgoing call) in the two conditional expressions of the table below.

Table A.{seq tab}: Type A PDUs

Item	PDU	Reference	Sending		Receiving	
			Status	Support	Status	Support
{seq item \r1}	Connect	1.1.1	c{seq tab \c}02		c{seq tab \c}01	
{seq item}	ConnectAck	1.1.2	c{seq tab \c}01		c{seq tab \c}02	

c{seq tab \c}01: IF A.**{seq tab tab_Calldir}**/1 THEN m ELSE n/a -- if incoming call supported then mandatory
c{seq tab \c}02: IF A.**{seq tab tab_Calldir}**/2 THEN m ELSE n/a -- if outgoing call supported then mandatory

14.2.3 Qualified optional items

The qualified optional numbers are generated using a sequence field named "opt".

To refer to this number in the status column, a reference to a bookmark which is defined on the qualified number part of the option is used.

The naming rule is: "opt_<meaningful wording>".

EXAMPLE: A bookmark named "opt_Calldir" has been created on **{seq opt}** of the option below and is referred to in the status column.

Item	Call direction	Reference	Status	Support
{seq item \r1}	incoming call	1.2, 4.6	o.{**seq opt opt_Calldir**}	
{seq item}	outgoing call	1.4, 4.7	o.{**seq opt opt_Calldir**}	

o.**{seq opt}**: It is mandatory to support at least one of these items.

14.2.4 Summary

Three sequences are used:

- to generate the table numbers: named "tab";
- to generate the item numbers: named "item";
- to generate the qualified optional items: named "opt".

Two types of bookmarks are used:

- table identifiers for item references in a conditional expression: named "tab_<meaningful wording>";
- qualified optional item references in the status column: named "opt_<meaningful wording>".

NOTE: To see actual uses of sequences and bookmarks, refer to the electronic version of annex A, using the visualization of field codes.

15 Maintenance aspects

All the previous clauses of this style guide deal with the production of an ICS proforma. However, it is important to think about the future of the ICS proforma that has been produced, and in particular about maintenance aspects.

Because other documents, such as ATS and profile requirement lists, refer to items of ICS proforma, it is necessary to keep these references unchanged, from one version to another. The item references contain the identifier of the table, therefore the table identifiers should not be modified after publication of the ICS proforma. See clause 14 to know the impact on sequences and bookmarks.

The following maintenance rules are commonly adopted by ETSI:

a) if tables are added between two existing tables, the table identifiers of the new tables should be <identifier of the previous table> a, b, c etc. (see example 1);

b) if a table is deleted, then it should replaced by the following text: "Deleted table" (see example 2);

c) if an item is added, it should be added at the end of the table (because a, b, c notation is already used for referring to the different support columns in case of multiple support columns);

d) if an item is removed, the row should stay, with "item deleted" in "item description" column.

EXAMPLE 1: ConnectAck and ConnectRej are new tables.

Table A.1: Connect

Item	Parameter	Reference	Status	Support
1	par1		o	
2	par2		o	

Table A.1a: ConnectAck

Item	Parameter	Reference	Status	Support
1	par1		o	
2	par2		m	

Table A.1b: ConnectRej

Item	Parameter	Reference	Status	Support
1	par1		m	
2	par2		o	

Table A.2: Release

Item	<Item description>	Reference	Status	Support
1	par1		o	
2	par2		o	

EXAMPLE 2: Table 2 has been deleted.

Table A.1: Connect

Item	Parameter	Reference	Status	Support
1	par1		o	
2	par2		o	

Table A.2: Table deleted

Table A.3: Release

Item	Parameter	Reference	Status	Support
1	par1		o	
2	par2		m	

16 Guidelines on profile ICS proforma

ETS 300 406 [1] clause 8 and ISO/IEC 9646-7 [3] provide an overview and general guidance about profile ICS proforma. That information is not repeated here.

To ease the production of requirement lists, the electronic version of the example contained in annex B accompanies the present document. It is also available from http://docbox.etsi.fr/editHelp/www/editHelp_intro.htm.

16.1 Guidelines on profile requirement list

The aim of the requirement list is to provide the modification of the status of items between the ICS proforma for the base specifications and the profile. It is actually a "delta" document. It is unusable alone, and is used with the ICS proforma of the base specification(s). To avoid introducing unnecessary complexity, the requirement list should provide only essential information, which is actually the new status. Thus it should not repeat of the base status. Using this method limits the references to the ICS proforma of the base specifications, thus easing the production, use and maintenance of the requirement list. This is particularly true in case of complicated conditions.

NOTE: This is a simplification of the recommendations contained in ISO/IEC 9646-7 [3]. A defect report exists in ISO/IEC JTC1/SC21/WG8, proposing that the base status column should be optional in the requirement list.

However, in case of the profile of a profile, the requirement list should repeat all the items present in the requirement list of the "base profile". Having several stages of requirement lists would make their use almost impossible.

The requirement list should be structured according to the base specification ICS proforma: one subclause for each base ICS proforma.

For the sake of convenience, a requirement list is always presented as an annex together with a copyright release (i.e. because of the need to make frequent copies). It is often the annex of the profile specification. Annex B of this style guide provides a requirement list template which would be contained in an annex (in this case it is called annex C) of the profile specification.

16.1.1 Guidelines on requirement list tables

The modification of the status of items is specified using tables.

For each table of the base ICS proforma containing an item whose status is modified by the profile, a table is provided in the requirement list. However, as stated before, this table should only provide the new status, and not repeat the item's status as given in the base specification. As a consequence:

- only the row for which the status is modified should appear;
- for an item whose status is modified, the status defined in the base specification ICS proforma should not appear.

EXAMPLE 1: Item 2 has not changed, thus the corresponding row is omitted. The requirement list for this example is contained in annex C.

Table C.1: [4] Table A.8 service elements

Item	Service	Profile reference	Profile status
1	T_ASSOCIATE	5.3, 8.6.4	m
3	T_U_ABORT	4.1	m

In the case of a table with multiple questions, if only one status is modified in the row, the other one should not be repeated. Only the reference of the base specification ICS should be mentioned, to indicate that the status is not modified by the profile.

EXAMPLE 2: The requirement list for this example is contained in annex C.

Table C.1: [4] Table A.5 Connect parameters

Item	Parameter	Sending		Receiving	
		Profile reference	Profile status	Profile reference	Profile status
1	RespNumber	1, 2	[4]	1.4	m
2	Display	1.3	m	1.5	m

If an entire table is "out-of-scope" (refer to "Profile status column" in subclause 16.1.1.1), in theory, all the items of the table should be repeated with a new status "i". However, in practice, it is permissible to summarize in one line that the whole table is "out-of-scope".

EXAMPLE 3: [2] Table A.6 Call directions: the status of all the items of this table is "i".

16.1.1.1 Table title and columns

Table title

The table title should provide an unambiguous reference to the corresponding table in the base specification ICS proforma.

EXAMPLE: **Table F.3: [2] Table A.6 Call directions**

This example shows the title of the third table of a requirement list, contained in annex F. This table contains the modifications of table A.6 of the ICS proforma whose reference is [2]. The **exact name** of this table in the ICS proforma is "Call directions".

Item column

This contains the same number as the corresponding one in the base specification ICS proforma. This means that if some rows are dropped in the requirement list, the item numbers will contain some "holes".

Item description column

This contains exactly the same description as the one provided in the base specification ICS.

Profile reference column

This contains the references to the appropriate clauses in the profile, which were used to determine the new status.

Profile status column

This specifies the status modified by the requirements of the profile. The rules about possible modifications to the status values are given in ISO/IEC 9646-7 [3] subclause 9.6. The general idea is to restrict the number of options of the base specification (e.g. optional capability in the protocol which becomes mandatory in the profile), or to declare some capabilities outside the scope of the given profile. For this, a new notation, not allowed for a base specification ICS, shall be used: "i" for "irrelevant".

Profile values allowed column

This specifies the values allowed by the profile.

16.1.1.2 Table types

For each possible table type (4 types) in an ICS proforma for a base specification, there is a corresponding table type for the requirement list. To specify a modification in an ICS base table, the corresponding type should be used in the requirement list.

In the following examples the requirement list is contained in annex C.

type 1:

EMPTY MODEL:

Table C.1: <wording>

Item	<Item description>	Profile reference	Profile status

EXAMPLE 1:

Table C.1: [3] Table A.2 service elements

Item	Service	Profile reference	Profile status
1	T_ASSOCIATE	5.3, 8.6.4	m
3	T_U_ABORT	4.1	i

type 2:

EMPTY MODEL:

Table C.1: <wording>

Item	<Item description>	<context1>		<context2>	
		Profile reference	Profile status	Profile reference	Profile status

EXAMPLE 2:

Table C.1: [3] Table A.4 class 1 PDUs

Item	PDU	Sending		Receiving	
		Profile reference	Profile status	Profile reference	Profile status
1	Connect	3.4, 8.7	m	3.2	m

type 3:

EMPTY MODEL:

Table C.1: <wording>

Item	<Item description>	Profile reference	Profile status	Profile values allowed

EXAMPLE 3:

Table C.1: [3] Table A.6 Transfer PDU

Item	Parameter	Profile reference	Profile status	Profile values allowed
1	Reason	5.2	m	'22'H
2	Function	5.3	m	1, 2
5	Recovery	5.4	i	0, 1
6	LifeTime	5.5	x	1 .. 24 -- sec

type 4:

EMPTY MODEL:

Table C.1: <wording>

Item	<Item description>	<context1>			<context2>		
		Profile reference	Profile status	Profile values allowed	Profile reference	Profile status	Profile values allowed

EXAMPLE 4:

Table C.1: [3] Table A.6 Response parameters

Item	Parameter	Sending			Receiving		
		Profile reference	Profile status	Profile values allowed	Profile reference	Profile status	Profile values allowed
1		1.2	m	'22'H	2.1	m	'22'H
2		1.4	m	1	2.3	m	1

16.1.2 Item references

The item references identify the answers in the support columns. A requirement list contains no support column. Thus the item references used in a requirement list, for example in a conditional expression, refer to support columns in the base specification ICS proforma. To avoid any ambiguity, the item references should be preceded by the reference to the relevant ICS proforma.

EXAMPLE: IF [3] A.4/5 THEN m ELSE o.

16.1.3 Guidelines on conditional and qualified optional items

In some cases, the new status of an item is conditional or qualified optional (i.e. c<condition number> or o.<integer>). To avoid any ambiguity with the existing references to conditional expressions and qualified optional items of the base specification ICS proforma, the numbering of conditionals and qualified optional items in the requirement should follow a specific naming rule: p<integer>. "p" stands for "profile". The numbering rule of <integer> is the same as for a base specification ICS proforma. Note that this is not a new status notation (i.e. the status are c and o). It is just a specific convention for the condition and option numbers.

EXAMPLE 1: cp201: IF [3] A.4/5 THEN m ELSE o.

cp201 is the condition 1 of table 2 of the requirement list.

EXAMPLE 2: o.p4: It is mandatory to support at least one of these options.

o.p4 is the option 4 of the requirement list.

Note that if the new status for an item is conditional, the condition should be expressed using profile conditions numbering (i.e. p<integer>), and not using a condition number existing in the base specification ICS, even if this condition already exists for another item in the base specification ICS.

16.1.4 Guidelines on the use of Microsoft Word

How to use electronic version of the requirement list example

To ease the production of ICS proforma using Microsoft Word, the electronic version of the example contained in annex B accompanies the present document.

It is not a template as is the one provided in annex A for a base specification. It is just given to demonstrate the use of the guidelines provided in previous subclauses. Its electronic version may be used in order to "copy and paste" the tables.

As for a base specification ICS proforma, a requirement list should be "hard coded" just before the publication, during the final editing phase. Refer to clause 14.

NOTE: The "hard coding" of the requirements list is normally carried out by the publishing editor only.

How to use sequences and bookmarks in a requirement list

As a rule, all references to the base specifications ICS proforma should be "hard coded". Thus there should be **no sequences nor bookmarks** for:

- the reference to the table identifier of the base specification ICS proforma;
- the item numbers in the item column;
- the item references.

On the other hand, sequences may be used for generating numbering local to the requirement list:

- the numbers of the requirement list tables;
- the <table number> part of a condition number;
- the qualified optional references.

EXAMPLE: A bookmark called "opt_Rel" has been created on **{seq opt}** of the option below and is referred to in the profile status column.

Table C.{seq tab}: [3] Table A.24 Release parameters

Item	Parameter	Profile reference	Profile status
1	Facility	5.3, 8.6.4	cp{seq tab \c}01
3	LifeTime	4.1	m
5	Reason	5.3	o.p{**seq opt opt_Rel**}
6	Cause	7.2, 8.3, 9.3	o.p{**seq opt opt_Rel**}

o.p**{seq opt}**: It is mandatory to support exactly one of these options.
cp{seq tab \c}01: IF [3] A.7/9 THEN m ELSE o

16.2 Guidelines on profile specific ICS proforma

A profile-specific ICS proforma is required when some requirements of the profile cannot be mapped onto existing items in the base specification ICS proforma. In practice, a profile specific ICS proforma is often not required.

As stated in ETS 300 406 [1] subclause 8.2.2, a profile specific proforma shall satisfy the same criteria as an ICS proforma for a base specification. The only difference is that it is allowed to express dynamic requirements, when dynamic requirements of the profile are different from the base specification.

Annex A:
Template of an ICS proforma specification

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the template in this annex so that it can be used for its intended purposes.

This annex contains text which may be used verbatim in ICS specifications. Such text is shown using standard (black) font. Guidance and explanatory text not intended to be included in ICS specifications are differentiated by being shown in *italics* font; this latter text is blue if viewed in electronic form.

A.1 Conventions

Conventions used in this template:

- *the text provided for guidance for the ICS proforma specifier is in italics. It should not be included in the actual ICS proforma;*
- *the text provided in brackets i.e. <wording>, should be replaced by the relevant text in the actual ICS proforma:*

EXAMPLE: "This <document type> provides the Implementation Conformance Statement" might be replaced by "This EN provides the Implementation Conformance Statement ...".

<reference specification> stands for the specification for conformance against which the ICS proforma is written (e.g. the protocol, the API, the PCI etc.). In particular:

- ***<reference specification type>** may be protocol, API, PCI, etc.;*
- ***<reference specification id>** is the identifier of the reference specification (e.g. "EN 300 403-1" or "ETS 300 374-5");*
- ***<reference specification title>** is the entire title of the reference specification;*
- ***<reference specification description>** is the reworded title of the reference specification.*

For example, in the case of an ICS proforma, contained in a stand-alone standard, and written for the protocol described in ETS 300 374-5 whose title is "Signalling Protocols and Switching (SPS); Intelligent Network Capability Set 1 (CS1); Core Intelligent Application Protocol (INAP); Part 5: protocol specification for the SCF-SDF interface":

- *<reference specification type> is "protocol";*
- *<reference specification id> is "ETS 300 374-5";*
- *<reference specification title> is "Signalling Protocols and Switching (SPS); Intelligent Network Capability Set 1 (CS1); Core Intelligent Application Protocol (INAP); Part 5: protocol specification for the SCF-SDF interface";*
- *<reference specification description> is "Intelligent Network Capability Set 1 (CS1) Core Intelligent Application Protocol (INAP) for the SCF-SDF interface".*

A.2 Keywords

The keywords **ICS** ***and****, if appropriate,* **PICS** *shall be included in the keywords element of the deliverable.*

A.3 Title

The title should be the same as that of the base specification followed by the words

Implementation Conformance Statement (ICS) specification

or

Protocol Implementation Conformance Statement (PICS) specification

as appropriate.

A.4 Introduction clause

An Introduction clause shall be present and shall contain at least the following text:

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

A.5 Scope clause

In addition to the text according to the skeleton, the following text shall be included:

The present document provides the Implementation Conformance Statement (ICS) proforma for the <reference specification description> defined in <reference specification id> [1] in compliance with the relevant requirements, and in accordance with the relevant guidance given in ISO/IEC 9646-7 [4] and ETS 300 406 [2].

A.6 References clause

*Include the following **normative** references:*

[1] <reference specification>.

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

[3] ISO/IEC 9646-1: "Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[4] ISO/IEC 9646-7: "Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

A.7 Definitions subclause

Include the following text and definitions:

- terms defined in <reference specification id> [1];
- terms defined in ISO/IEC 9646-1 [3] and in ISO/IEC 9646-7 [4].

In particular, the following terms defined in ISO/IEC 9646-1 [3] apply:

Implementation Conformance Statement (ICS): A statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented. The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, information object ICS, etc.

ICS proforma: A document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS.

NOTE: Include the following definition if <reference specification type> = "protocol".

Protocol ICS (PICS): An ICS for an implementation or system claimed to conform to a given protocol specification.

NOTE: Include the following definition if <reference specification type> ≠ "protocol".

<reference specification type> ICS: An ICS for an implementation or system claimed to conform to a given <reference specification type> specification.

EXAMPLE:

***API ICS:** An ICS for an implementation or system claimed to conform to a given API specification.*

New abbreviations, like "PICS", should not be created for other reference specification types. For example, an ICS for an API is an API ICS and not an AICS.

A.8 Abbreviations subclause

The abbreviations subclause shall contain at least the following entries:

ICS	Implementation Conformance Statement
IUT	Implementation Under Test
SCS	System Conformance Statement
SUT	System Under Test

and, if applicable:

PICS	Protocol ICS

In the remainder of this template, "ICS" should be replaced globally by "PICS" in case of <reference specification type> = "protocol".

A.9 "Conformance to this ICS proforma specification" clause

The conformance clause is a clause which concerns the ICS proforma and completed ICS themselves and not the implementation. This clause restricts what is allowed to be an ICS proforma which conforms to this ICS proforma specification. According to ISO/IEC 9646-7 [3], this clause shall not restrict natural language (an ICS proforma with questions translated into another language is still compliant with the ICS proforma specification), or pagination. If no special reason exists, it is not recommended to add restrictions to the following text.

The conformance clause shall contain at least (and probably only) the following text:

If it claims to conform to the present document, the actual ICS proforma to be filled in by a supplier shall be technically equivalent to the text of the ICS proforma given in annex A, and shall preserve the numbering/naming and ordering of the proforma items.

An ICS which conforms to the present document shall be a conforming ICS proforma completed in accordance with the guidance for completion given in clause x.1.

Annex x (normative): ICS proforma for <reference specification id>

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

x.1 Guidance for completing the ICS proforma

x.1.1 Purposes and structure

The purpose of this ICS proforma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in ETS <reference specification id> [1] may provide information about the implementation in a standardized manner.

The ICS proforma is subdivided into subclauses for the following categories of information:

- guidance for completing the ICS proforma;
- identification of the implementation;
- identification of the <reference specification type>;
- global statement of conformance;
- <further subclauses>.

Further subclauses of the ICS proforma tables clause depend on the reference specification. They shall be structured in a hierarchical manner from general questions to detailed ones, beginning with the major capabilities of the implementation followed by the underlying items. For more details, refer to ISO/IEC 9646-7 [4] subclause 8.5 and ETS 300 406 [2] clause A.2.

EXAMPLE:

- *instructions for completing the PICS proforma;*
- *identification of the implementation;*
- *identification of the protocol;*
- *global statement of conformance;*
- *roles;*
- *user role;*
  - *major capabilities;*
  - *PDUs;*
    - *type A;*
    - *type B;*
  - *PDU parameters;*
    - *parameters of type A PDUs;*
    - *parameters of type B PDUs;*
  - *timers;*
  - *negotiation capabilities;*

- *protocol error handling;*

- *network role;*
  - *major capabilities;*
  - *PDUs;*
    - *type A;*
    - *type B;*
  - *PDU parameters;*
    - *parameters of type A PDUs;*
    - *parameters of type B PDUs;*
  - *timers;*
  - *negotiation capabilities;*
  - *protocol error handling.*

In certain cases it may be useful to add in this subclause an explanation about the structure, and about the content of the different parts of the structure.

x.1.2 Abbreviations and conventions

The ICS proforma contained in this annex is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7 [4].

Item column

The item column contains a number which identifies the item in the table.

Item description column

The item description column describes in free text each respective item (e.g. parameters, timers, etc.). It implicitly means "is <item description> supported by the implementation?".

Status column

The following notations, defined in ISO/IEC 9646-7 [4], are used for the status column:

m	mandatory - the capability is required to be supported.
o	optional - the capability may be supported or not.
n/a	not applicable - in the given context, it is impossible to use the capability.
x	prohibited (excluded) - there is a requirement not to use this capability in the given context.
o.i	qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer which identifies an unique group of related optional items and the logic of their selection which is defined immediately following the table.

NOTE: In the case where items of the group do not always belong to the same table, all o.i shall be defined in the last subclause of the ICS proforma, and the text "which is defined immediately following the table" should be replaced by "which is defined in the last subclause of this annex".

ci	conditional - the requirement on the capability ("m", "o", "x" or "n/a") depends on the support of other optional or conditional items. "i" is an integer identifying an unique conditional status expression which is defined immediately following the table.

If irrelevant status is used, the following notation should be added:

i	irrelevant (out-of-scope) - capability outside the scope of the reference specification. No answer is requested from the supplier.

NOTE 1: This use of "i" status is not to be confused with the suffix "i" to the "o" and "c" statuses above.

If it is used for transparent parameters in received PDUs, it should be indicated that in that case, the supplier should give an explanation about his answer (refer to annex C of the style guide).

Reference column

The reference column makes reference to ETS <reference specification id> [1], except where explicitly stated otherwise.

Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7 [4], are used for the support column:

Y or y	supported by the implementation.
N or n	not supported by the implementation.
N/A, n/a or -	no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

If this ICS proforma is completed in order to describe a multiple-profile support in a system, it is necessary to be able to answer that a capability is supported for one profile and not supported for another. In that case, the supplier shall enter the unique reference to a conditional expression, preceded by "?" (e.g. ?3). This expression shall be given in the space for comments provided at the bottom of the table. It uses predicates defined in the SCS, each of which refers to a single profile and which takes the value TRUE if and only if that profile is to be used.

EXAMPLE 1: ?3: IF prof1 THEN Y ELSE N

In case of protocol, the following text should be added:

NOTE 2: As stated in ISO/IEC 9646-7 [4], support for a received PDU requires the ability to parse all valid parameters of that PDU. Supporting a PDU while having no ability to parse a valid parameter is non-conformant. Support for a parameter on a PDU means that the semantics of that parameter are supported.

If the ICS proforma does not contain tables with "values allowed" columns and "values supported" columns, the two following column descriptions shall be removed.

Values allowed column

The values allowed column contains the type, the list, the range, or the length of values allowed. The following notations are used:

- range of values: <min value> .. <max value>
  example: 5 .. 20

- list of values: <value1>, <value2>, ..., <valueN>
  example: 2 ,4 ,6 ,8, 9
  example: '1101'B, '1011'B, '1111'B
  example: '0A'H, '34'H, '2F'H

- list of named values: <name1>(<val1>), <name2>(<val2>), ..., <nameN>(<valN>)
  example: reject(1), accept(2)

- length: size (<min size> .. <max size>)
  example: size (1 .. 8)

Values supported column

The values supported column shall be filled in by the supplier of the implementation. In this column, the values or the ranges of values supported by the implementation shall be indicated.

References to items

For each possible item answer (answer in the support column) within the ICS proforma a unique reference exists, used, for example, in the conditional expressions. It is defined as the table identifier, followed by a solidus character "/", followed by the item number in the table. If there is more than one support column in a table, the columns are discriminated by letters (a, b, etc.), respectively.

EXAMPLE 2: A.5/4 is the reference to the answer of item 4 in table 5 of annex A.

EXAMPLE 3: A.6/3b is the reference to the second answer (i.e. in the second support column) of item 3 in table 6 of annex A.

Prerequisite line

A prerequisite line takes the form: Prerequisite: <predicate>.

A prerequisite line after a clause or table title indicates that the whole clause or the whole table is not required to be completed if the predicate is FALSE.

x.1.3 Instructions for completing the ICS proforma

The supplier of the implementation shall complete the ICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support or supported column boxes provided, using the notation described in subclause x.1.2.

If there is no "values supported" column, the text "or supported" should be removed.

However, the tables containing in "user role" subclause shall only be completed for user implementations, and the tables containing in "network role" subclause shall only be completed for network implementations.

The sentence about user and network are here only for the need of the example, and should be removed or modified for the actual ICS proforma.

If necessary, the supplier may provide additional comments in space at the bottom of the tables or separately.

More detailed instructions are given at the beginning of the different subclauses of the ICS proforma.

x.2 Identification of the implementation

Identification of the Implementation Under Test (IUT) and the system in which it resides (the System Under Test (SUT)) should be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product supplier information and client information should both be filled in if they are different.

A person who can answer queries regarding information supplied in the ICS should be named as the contact person.

x.2.1 Date of the statement

.....

x.2.2 Implementation Under Test (IUT) identification

IUT name:

.....

.....

IUT version:

.....

x.2.3 System Under Test (SUT) identification

SUT name:

.....

.....

Hardware configuration:

.....

.....

.....

Operating system:

.....

x.2.4 Product supplier

Name:

.....

Address:

.....

.....

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

.....

x.2.5 Client (if different from product supplier)

Name:

.....

Address:

.....

.....

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

x.2.6 ICS contact person

(A person to contact if there are any queries concerning the content of the ICS)

Name:

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

.....

x.3 Identification of the <reference specification type>

This ICS proforma applies to the following standard:

<reference specification id> (<date>): "<reference specification title>".

If the ICS proforma applies for amendments of the reference specification, this fact should be reflected here.

x.4 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No) .....

NOTE: Answering "No" to this question indicates non-conformance to the <reference specification type> specification. Non-supported mandatory capabilities are to be identified in the ICS, with an explanation of why the implementation is non-conforming, on pages attached to the ICS proforma.

All of the following subclauses are only given as an example, and should be removed from the ICS proforma produced. It is not an actual example, and it has been created for the purposes of this ICS proforma template. Its aim is to demonstrate the use of each table type, of the different status values, and the use of sequences and bookmarks. The example is semantically consistent. However, it should not be considered as a generic example. In particular, it does not present the only possibility to deal with the sending/receiving cases (two different sets of tables of type 1 or 3 may be used).

NOTE: Contrary to the first part of the template, the examples are no longer presented in italics text to facilitate their immediate usability. Only text for guidance is written in italics.

To create the actual ICS tables, follow the guidance given in clause 14 of the ICS proforma style guide, especially to copy and paste tables which contain bookmarks.

Empty table models (which contain no bookmarks) are presented at the end of this proforma template.

x.5 Roles

Table x.1: Roles

Item	Role	Reference	Status	Support
1	user	1.3	o.1	
2	network	1.2	o.1	

o..1: It is mandatory to support exactly one of these items.

Comments:

x.6 User role

This subclause contains the ICS proforma tables related to the user role. They need to be completed only for user implementations:

Prerequisite: x.1/1 -- user role

x.6.1 Major capabilities

Table x.2: Call directions

Item	Call direction	Reference	Status	Support
1	incoming call	1.2, 4.6	o.2	
2	outgoing call	1.4, 4.7	o.2	

o..2: It is mandatory to support at least one of these items.

Comments:

x.6.2 PDUs

x.6.2.1 Type A

Table x.3: Type A PDUs

Item	PDU	Sending			Receiving		
		Reference	Status	Support	Reference	Status	Support
1	Connect	1.1, 6	c303		1.1, 7	c301	
2	ConnectAck	3.5	c302		3.6	c303	

c301: IF x.2/1 THEN m ELSE n/a -- incoming call
c302: IF x.2/1 THEN o ELSE n/a -- incoming call
c303: IF x.2/2 THEN m ELSE n/a -- outgoing call

Comments:

x.6.2.2 Type B

Table x.4: Type B PDUs

Item	PDU	Sending			Receiving		
		Reference	Status	Support	Reference	Status	Support
1	Release	1, 4	m		2.4, 6.7	m	
2	ReleaseAck	1, 8	m		8	m	

Comments:

x.6.3 PDU parameters

x.6.3.1 Parameters of type A PDUs

Table x.5: Connect sent parameters

Prerequisite: x.3/1a -- Connect sent

Item	Parameter	Reference	Status	Support
1	All parameters	4.3, 7.3.2, 9.1	m	

Comments:

Table x.6: Connect received parameters

Prerequisite: x.3/1b -- Connect received

Item	Parameter	Reference	Status	Support
1	All parameters	4.3, 7.3.2, 9.1	m	

Comments:

Table x.7: ConnectAck sent parameters

Prerequisite: x.3/2a -- ConnectAck sent

Item	Parameter	Reference	Status	Support
1	RespNumber	4.3, 7.3.2, 9.1	m	
2	Display	4.3, 7.3.2, 9.1	o	

Comments:

Table x.8: ConnectAck received parameters

Prerequisite: x.3/2b -- ConnectAck received

Item	Parameter	Reference	Status	Support
1	RespNumber (transp)	4.6, 9.6	m (note)	
2	Display (transp)	4.6, 7.3.1	i	
NOTE: This parameter is transparent. The support of this parameter implies its transmission to the layer 4.				

Comments:

x.6.3.2 Parameters of type B PDUs

NOTE: It is not recommended to use landscape tables. It is recommended to split the table into two parts, each dealing with one context. However, the next table is provided to demonstrate the use of a type 4 table.

Table x.9: Release parameters

Item	Parameter	Sending					Receiving				
		Reference	Status	Support	Values		Reference	Status	Support	Values	
					Allowed	Supported				Allowed	Supported
1	Cause	7.1, 8.3.1, 6.3	m		Normal (1) Reject (2)		7.1, 8.3.2, 6.4	m		Normal (1) Reject (2)	
2	LifeTime	7.2, 8.1.1	o		1 .. 8 --sec		7.2, 8.1.2	o		1 .. 8 --sec	

Comments:

Because some values are mandatory whilst others are optional within the list of values for the Cause parameter sent by the user, an additional table listing all parameters with their status is provided.

Table x.10: Values of Cause parameter in Release sent

Item	Cause value	Reference	Status	Support
1	Normal	8.3	m	
2	Reject	8.3	o	

Comments:

Table x.11: ReleaseAck parameters

Item	Parameter	Sending			Receiving		
		Reference	Status	Support	Reference	Status	Support
1	Cause	5.1, 7.8	o		5.2, 7.9	m	
2	NestedConditionalsExample	6.9	c1101		6.10	c1102	

c1101: IF x.3/4 OR (x.3/5 AND x.3/8) -- ConnectAck OR (Release AND ReleaseAck)
THEN m
ELSE (IF x.3/6 THEN o ELSE n/a) -- Connect

c1102: IF x.3/4 AND (x.3/5 AND (x.3/8 OR NOT x.3/9 OR x.3/3 OR x.3/2) OR (NOT x.3/1 AND x.3/7))
THEN m ELSE o

Comments:

NOTE: Item 2 and its status boxes contain no semantic. It just demonstrates how to write nested conditional expressions.

x.7 Network role

This subclause contains the ICS proforma tables related to the network role. They need to be completed only for network implementations:

Prerequisite: x.1/2 network role

etc.

Empty tables

type 1

Table x.12: <wording>

Item	<Item description>	Reference	Status	Support
1				
2				
3				
4				

type 2

Table x.13: <wording>

Item	<Item description>	<context1>			<context2>		
		Reference	Status	Support	Reference	Status	Support
1							
2							
3							
4							

type 3

Table x.14: <wording>

Item	<Item description>	Reference	Status	Support	Values	
					Allowed	Supported
1						
2						
3						
4						

type 4

Table x.15: <wording>

Item	<Item description>	<context1>					<context2>				
		Reference	Status	Support	Values		Reference	Status	Support	Values	
					Allowed	Supported				Allowed	Supported
1											
2											
3											
4											

Annex B:
Requirement list example

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the template in this annex so that it can be used for its intended purposes.

This annex contains text which may be used verbatim in ICS specifications. Such text is shown using normal (black) font. Guidance and explanatory text not intended to be included in ICS specifications are differentiated by being shown in *italics* font; this latter text is blue if viewed in electronic form.

This example should be used as a basis for producing a profile requirement list. It is not a template such as the one provided for the ICS proforma of a base specification - it contains less information about the general structure. It is merely given to demonstrate the use of the guidelines provided in subclause 16.1. Its electronic version may be used in order to "copy and paste" the tables.

Conventions used in this example

The text provided for guidance for the ICS proforma specifier is in *italics*. It should be removed in the actual requirement list.

For the purpose of this invented example

- the profile is: "Data communication, telematic profile", ETS 300 020, **the requirement list is annex "y"**;
- the 3 base specifications are:
  - "data communication protocol, layer 3", ETS 300 001 (reference [1] in the profile);
  - "data communication protocol, layer 4", ETS 300 002 (reference [2] in the profile);
  - "data communication protocol, layer 5", ETS 300 003 (reference [3] in the profile);
- the 3 corresponding PICS proforma are:
  - "data communication protocol, layer 3, PICS proforma specification", ETS 300 011, (reference [4] in the profile);
  - "data communication protocol, layer 4, PICS proforma specification", ETS 300 012, (reference [5] in the profile);
  - "data communication protocol, layer 5, PICS proforma specification", ETS 300 013, (reference [6] in the profile).

NOTE: "Data communication protocol, layer 3, PICS proforma specification" is the example provided in annex A. Refer to it to understand the requirement list.

Annex y (normative): Profile requirement list

y.1 Purpose and structure

The purpose of this requirement list is to specify the modifications that apply to the status of the items affected in the ICS proforma of each base specifications.

The requirement list is subdivided into subclauses each dealing with a given base specification:

- tables for data communication layer 3 protocol [1];
- tables for data communication layer 4 protocol [2];
- tables for data communication layer 5 protocol [3].

y.2 Tables for data communication layer 3 protocol [1]

This clause identifies the modifications to the requirements expressed in the PICS proforma specification for data communication, layer 3 [4].

y.2.1 User role

In the profile, incoming call is mandatory:

Table y.1: [4] Table A.2 Call directions

Item	Call direction	Profile reference	Profile status
1	incoming call	7.1	m

Because an incoming call is mandatory for the profile, the items which were conditional on the support of the incoming call are no longer conditional. This is why Connect received and ConnectAck sent are no longer conditional. On the other hand, because the status of outgoing call is not modified, the status of Connect sent and ConnectAck received are not changed:

Table y.2: [4] Table A.3 Type A PDUs

Item	PDU	Sending		Receiving	
		Profile reference	Profile status	Profile reference	Profile status
1	Connect	4.5, 7.2	[4]	8.1	m
2	ConnectAck	7.2, 5.3.2	o	8.2	[4]

Table y.3: [4] Table A.7 ConnectAck sent parameters

Item	Call direction	Profile reference	Profile status
2	Display	7.1	cp301

cp301: IF [4] A.14/2 THEN m ELSE o -- feature4

NOTE: [4] A.14/2 does not exist. It is just used to provide a conditional item template.

etc.

y.2.2 Network role

etc.

y.3 Tables for data communication layer 4 protocol [2]

The profile places no restriction on the support answers requested by the PICS proforma provided in PICS proforma specification for data communication, layer 4 [5].

y.4 Tables for data communication layer 5 protocol [3]

The profile places no restriction on the support answers requested by the PICS proforma provided in PICS proforma specification for data communication, layer 5 [6].

Empty tables

type 1

Table y.4: <wording>

Item	<Item description>	Profile reference	Profile status

type 2

Table y.5: <wording>

Item	<Item description>	<context1>		<context2>	
		Profile reference	Profile status	Profile reference	Profile status

type 3

Table y.6: <wording>

Item	<Item description>	Profile reference	Profile status	Profile values allowed

type 4

Table y.7: <wording>

Item	<Item description>	<context1>			<context2>		
		Profile reference	Profile status	Profile values allowed	Profile reference	Profile status	Profile values allowed

Annex C: Parameters on received PDUs (or messages, primitives etc.)

Most of ICS proforma specifiers have to deal with PICS items concerning the support of parameters on received PDUs, and for most of them the semantic of such items is not clear at all. In fact, what does "to support a received parameter" mean? Annex H of ISO/IEC 9646-7 [3] provides some guidance to clarify this issue. However, although the general approach in annex H is good, it would need some refinement. A defect report has been presented by ETSI TC MTS for this purpose. The guidance given in this subclause supersedes the text of ISO/IEC 9646-7 [3], annex H.

NOTE: The following text relates to the protocol case. However, the principles may be applied for other types of reference specifications (e.g. API).

C.1 Background

It has been found that some PICS proforma record a status of "m" for most of parameters on received PDUs. In such cases, it may be that the PICS proforma specifiers assumed that the status "m" is necessary whenever it is required that a conforming implementation supports the parsing of a parameter on a received PDU. It is now clear that the requirement to parse a parameter on a received PDU is implied by the support of the receipt of that PDU. Therefore, a PICS proforma question concerning support for a parameter on a received PDU should be understood to relate solely to the support of the full functionality associated with that parameter.

Several questions then arise. Firstly, if "to support a received parameter" does not mean to be able to parse it, what does it mean? Secondly, what are the appropriate status?

NOTE: It is implicit that the question concerning a received parameter relates to the receipt of a valid parameter.

C.2 Support and status in ICS proforma

Parameters on a received PDU are regarded as either transparent or non-transparent. A parameter on a received PDU is called **transparent** if the actions to be taken are not detectable in the subsequent behaviour of the instance of the protocol machine that received this parameter. All other parameters on received PDUs are called **non-transparent**.

C.2.1 Transparent parameters

There are two kinds of transparent parameters: the "non-described transparent" and the "described transparent".

"Non-described transparent" parameters

Received parameters are called "non-described transparent" when the specification does not describe at all its usage **by the implementation**. It is a parameter for which no action after its receipt is specified.

The meaning of a question concerning such a received parameter in a PICS proforma is quite delicate. Firstly, what does "supporting" such a parameter mean, if the standard does not describe its usage? In fact, the question is meaningless, since there is no corresponding requirement in the specification. From the point of view of the ICS proforma specifier, the question is without purpose. A subsequent question is then: how to find a status for a question whose meaning is not known?

The case of "non-described transparent" parameters should be treated as follows:

1) The parameter should appear in the ICS proforma, for the sake of completeness of a PDU parameter list. It cannot be simply omitted.

2) No precise question can be asked relative to this parameter. This means that a specific status notation should be used, to indicate that the parameter is mentioned, but no question asked. The N/A status does not apply here since it normally means "the specification makes it impossible to use this capability". It is proposed for simplicity to extend the use of "i" (out of scope) to apply to such cases.

3) It might however, be useful to leave the possibility for the supplier to document - freely - what the implementation does with the parameter. The supplier could answer "yes, I support, and by supporting I mean: .... " In other words, the supplier should document the answer by describing the subsequent behaviour of the implementation after receiving the parameter, in order to give meaning to the question.

Before ISO/IEC 9646-7 [3] takes this issue into account and provides relevant guidance, the following practical solution should be applied. It should nevertheless be considered as a temporary solution, compatible with the current recommendations of ISO/IEC 9646-7 [3].

A key word (transp) may also be used in the item description to indicate that the parameter is transparent, and that this has an impact on the meaning of the question. The status notation used for a "non-described transparent" should be "i" (out of scope). with a note indicating that:

- the parameter is transparent; and
- the support of the parameter is given no meaning within the scope of the protocol; and
- the supplier has the choice to answer or not; and
- any answer given should be explained.

EXAMPLE 1: **Table in the ICS proforma:**

Table A.1: Parameters in Release received

Item	Parameter	Reference	Status	Support
1	Cause (transp)	4.3	i	

Completed ICS:

- case 1: the supplier chooses not to answer:

Table A.1: Parameters in Release received

Item	Parameter	Reference	Status	Support
1	Cause (transp)	4.3	i	-

- case 2: the supplier chooses to answer, and expresses the meaning of the item:

Table A.1: Parameters in Release received

Item	Parameter	Reference	Status	Support
1	Cause (transp)	4.3	i	Y (1)

Comments:

1: This parameter is passed to the maintenance entity.

"Described transparent" parameters

Received parameters are called "described transparent" when the usage is precisely described in the specification, although this usage, from a strict point of view, is out of the scope of the protocol. It is the case, for example, of a parameter which is passed to the next layer through the service interface, and which has no impact on the protocol machine (e.g. a user-data parameter). It is also the case of a parameter which is transmitted transparently to a distant entity (e.g. a parameter transmitted by a relay or a gateway - the mandatory requirement of acting as a relay does not concern directly the protocol, i.e. the considered instance of the protocol machine).

For this type of received parameter, the meaning of a question concerning its support may be identified by the PICS specifier, because a description of its usage is clearly expressed in the specification. Moreover, this question is useful because the function of transporting/transmitting is often essential in a base specification, even if it is out of the scope in the pure context of the protocol. However, the question should be documented by the PICS proforma specifier.

The difference with the case of the non described transparent treated before is that, here, the meaning of "supporting" the parameter is known, and can be documented at the stage of ICS proforma specification.

The case of "described transparent" parameters should be treated as follows:

1) The status of a "described transparent" parameter may be mandatory or optional (or conditional). For example, the function to transmit a received parameter to the next layer may be mandatory in a base specification (e.g. ISDN layer 2 protocol: DL_DATA passed to the layer 3 through a DL_DATA_IND service primitive). On the other hand, it may be optional in the base specification, and mandatory only in a given profile.

2) A note may be used to clarify the meaning of "supporting the parameter", since this meaning is not the downright application of a protocol conformance requirement. This note resembles that of "non-described transparent" parameters; the essential difference is that the note is provided here by the ICS proforma specifier (whereas that of "non-described transparent" parameters was - if any - provided by the supplier of the implementation).

Before ISO/IEC 9646-7 [3] takes this issue into account and provides relevant guidance, the following practical solution should be applied. It should be considered as a temporary solution, nevertheless compatible with the current recommendations of ISO/IEC 9646-7 [3].

The status notation used for a "described transparent" should be <status> with a note indicating the meaning of the support of the parameter.

NOTE: The editing rules of ETSI recommend the use of notes instead of footnotes, contrary to ISO/IEC 9646-7 [3].

EXAMPLE 2: The next table presents how to deal with such a parameter in the ICS proforma.

Table A.1: Parameters in DL_DATA received

Item	Parameter	Reference	Status	Support
1	DATA (transp)	4.3	m (note)	
NOTE: The support of this parameter implies its transmission to layer 3.				

C.2.2 Non-transparent parameters

By definition, the requirements concerning the receipt of a non-transparent parameter belong to the protocol machine specification. The meaning of the associated question in the PICS proforma is without any ambiguity: to support the receipt of the parameter means that the implementation supports the full functionality of the parameter. This functionality is described in the protocol specification, and affects the behaviour of the protocol machine.

The status of a non-transparent may be mandatory, optional (or conditional). The status is optional (or conditional) when the implementor has the choice to implement the functionality of the parameter or to discard the received parameter. The most typical example is the case of parameters whose usage is linked to a more general capability, which is itself optional. In that case, the parameter status is conditional upon the support of the more general capability (i.e. IF capability THEN m else n/a). In that case, the "optionality" of the parameter is expressed at the level of the more general capability. However, its intrinsic status is optional.

NOTE: A non transparent parameter is frequently conditional upon a more general capability, than optional "on its own", because in most of cases a parameter is linked to a more general capability.

In the case of non-transparent parameters, the only difference with ISO/IEC 9646-7 [3] annex H, is that this style guide allows the status optional and conditional.

EXAMPLE: In ISDN layer 3 protocol, the "high layer compatibility" parameter received in a SETUP message is used to make compatibility checking: if it is compatible, the call is accepted, otherwise the call is rejected. The fact to process it has an impact on the protocol machine. Thus it is a non-transparent parameter. The support of this parameter is optional (i.e. the parameter may be discarded). However, the optionality is expressed in a major capability: the support of compatibility checking of the higher layers.

Table A.1: Major capabilities

Item	Major capability	Reference	Status	Support
1	Compatibility checking of the higher layers	4.3	o	

Table A.8: Parameters in SETUP received

Item	Parameter	Reference	Status	Support
1	high layer compatibility	4.3	c101	

c101: IF A.1/1 THEN m ELSE n/a

History

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