INTERNATIONAL TELECOMMUNICATION UNION

# ITU-T

# X.294

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(04/95)

## DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS

## OPEN SYSTEMS INTERCONNECTION – CONFORMANCE TESTING

---

# OSI CONFORMANCE TESTING METHODOLOGY AND FRAMEWORK FOR PROTOCOL RECOMMENDATIONS FOR ITU-T APPLICATIONS – REQUIREMENTS ON TEST LABORATORIES AND CLIENTS FOR THE CONFORMANCE ASSESSMENT PROCESS

**ITU-T Recommendation X.294**

(Previously “CCITT Recommendation”)

---

## FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation X.294 was revised by ITU-T Study Group 7 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 10th of April 1995.

---

NOTE

In this Recommendation, the expression “Administration” is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

ITU-T X-SERIES RECOMMENDATIONS

**DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS**

(February 1994)

**ORGANIZATION OF X-SERIES RECOMMENDATIONS**

| Subject area | Recommendation Series |
|---|---|
| PUBLIC DATA NETWORKS | |
| Services and Facilities | X.1-X.19 |
| Interfaces | X.20-X.49 |
| Transmission, Signalling and Switching | X.50-X.89 |
| Network Aspects | X.90-X.149 |
| Maintenance | X.150-X.179 |
| Administrative Arrangements | X.180-X.199 |
| OPEN SYSTEMS INTERCONNECTION | |
| Model and Notation | X.200-X.209 |
| Service Definitions | X.210-X.219 |
| Connection-mode Protocol Specifications | X.220-X.229 |
| Connectionless-mode Protocol Specifications | X.230-X.239 |
| PICS Proformas | X.240-X.259 |
| Protocol Identification | X.260-X.269 |
| Security Protocols | X.270-X.279 |
| Layer Managed Objects | X.280-X.289 |
| Conformance Testing | X.290-X.299 |
| INTERWORKING BETWEEN NETWORKS | |
| General | X.300-X.349 |
| Mobile Data Transmission Systems | X.350-X.369 |
| Management | X.370-X.399 |
| MESSAGE HANDLING SYSTEMS | X.400-X.499 |
| DIRECTORY | X.500-X.599 |
| OSI NETWORKING AND SYSTEM ASPECTS | |
| Networking | X.600-X.649 |
| Naming, Addressing and Registration | X.650-X.679 |
| Abstract Syntax Notation One (ASN.1) | X.680-X.699 |
| OSI MANAGEMENT | X.700-X.799 |
| SECURITY | X.800-X.849 |
| OSI APPLICATIONS | |
| Commitment, Concurrency and Recovery | X.850-X.859 |
| Transaction Processing | X.860-X.879 |
| Remote Operations | X.880-X.899 |
| OPEN DISTRIBUTED PROCESSING | X.900-X.999 |

# CONTENTS


*Page*

1 Scope ..... 1

2 References ..... 2

3 Definitions ..... 3

4 Abbreviations ..... 3

5 Overview of the conformance assessment process ..... 4
- 5.1 Introduction ..... 4
- 5.2 Preparation for testing ..... 4
- 5.3 Test operations ..... 4
- 5.4 Test report production ..... 5

6 Preparation for testing ..... 5
- 6.1 Introduction ..... 5
- 6.2 Requirements for testability of the System under Test ..... 5
- 6.3 Communication between the test laboratory and the client ..... 8
- 6.4 Documentation for conformance assessment ..... 10

7 Test operations ..... 12
- 7.1 Introduction ..... 12
- 7.2 Static conformance review ..... 14
- 7.3 Test selection ..... 15
- 7.4 Test parameterization ..... 17
- 7.5 Verification of Test Coordination Procedures ..... 17
- 7.6 Test campaign ..... 18
- 7.7 Negotiated exits during the test campaign ..... 20

8 Test report production ..... 21
- 8.1 Conformance test reports ..... 21
- 8.2 System Conformance Test Report (SCTR) ..... 22
- 8.3 Protocol Conformance Test Report (PCTR) ..... 22

9 Compliance ..... 23
- 9.1 Test laboratory role ..... 23
- 9.2 Client role ..... 24

Annex A – System Conformance Test Report (SCTR) template ..... 25
- A.1 Introduction ..... 25
- A.2 Conformance ..... 25
- A.3 SCTR proforma ..... 25

Annex B – Protocol Conformance Test Report (PCTR) template ..... 29
- B.1 Introduction ..... 29
- B.2 Conformance ..... 29
- B.3 PCTR proforma ..... 29

Appendix I – Skeleton IXIT template ..... 33
- I.1 Introduction ..... 33
- I.2 IXIT proforma ..... 33

## SUMMARY

This Recommendation specifies requirements on both the test laboratory and client, for the conduct of the conformance assessment process. The requirements are those necessary to achieve comparability of results of tests on similar implementations performed by different test laboratories. This Recommendation also provides some guidance on the conformance assessment process. The text was developed jointly with ISO/IEC JTC1 and the main intent of this revision is to reflect the changes as a result of the work on Protocol Profile Testing Methodology (PPTM) and on Multi-Party Testing Methodology (MPyTM).

# INTRODUCTION

Conformance testing requires mutual understanding and agreement between the test laboratory and the client. This Recommendation addresses the roles of both the test laboratory and the client during the conformance assessment process, the need to reach mutual agreements between them, and the requirements on each of them.

The conformance assessment process is the most visible process of conformance testing, where the results of test suite standardization are put to real use. This is also the stage at which there is potentially the most scope for variations to occur. As this Recommendation is concerned with the relatively formal process of testing implementations, it is important that the number and nature of such variations be very limited. One of the major objectives of standardizing the conformance testing process is to achieve an acceptable and useful degree of comparability of results of conformance assessments of similar implementations. If this is to be achieved, not only should the same source of tests be used (i.e. as specified in appropriate standards), but also the methods of selecting and parameterizing these tests, and presenting their results, should be, to a large extent, the same.

This Recommendation addresses the issues which should be taken into account, by both the test laboratory and the client, if the necessary consistency of conformance assessment is to be achieved. The target audiences for this Recommendation are the test laboratories and their clients. The test laboratory is responsible for conducting the conformance assessment of an OSI implementation at the request of a client. Typically, test laboratories are:

1) organizations developing or supplying OSI implementations (first-party test laboratories);

2) organizations willing to verify OSI implementations themselves before using them (second-party test laboratories);

3) organizations, independent of suppliers or users of OSI implementations, whose business is the testing of such implementations (third-party test laboratories).

Clients may be implementors or suppliers of real open systems or other OSI systems, who are applying for their own implementations to be tested. Alternatively, they may be procurers of those implementations, or any other interested party. The applicability of this Recommendation is independent of the relationship between the client and the implementation. During the conformance assessment process, the client is responsible for the conformance statements accompanying the System under Test (SUT) and for the configuration of the SUT.

Secondary, but related, audiences to whom this Recommendation could also be of interest

a) are test realizers;

b) organizations responsible for the accreditation of first- , second- or third-party test laboratories;

c) organizations responsible for the issue of test certificates which are based upon the conformance test reports issued by test laboratories;

d) readers of conformance test reports.

Within this Recommendation, the conformance assessment process relating to both the test laboratory and the client is divided into three phases:

i) preparation for testing;

ii) test operation;

iii) production of test reports.

An overview of these three phases is given in clause 5. Clauses 6 to 9 state requirements on how to conduct these three phases.

For the purposes of this Recommendation, it is assumed that a test laboratory is available and is already organized to provide a conformance assessment service. The test laboratory is assumed to have acquired from a test realizer (whether or not the latter belongs to the same organization) means of Testing IUTs, for one or more OSI protocols and according to one or more Abstract Test Methods (ATMs). This Recommendation specifies requirements on the test laboratory with respect to the conduct of the conformance assessment process for a particular client.

Similarly, it is assumed that a client is ready to apply for conformance assessment of an OSI implementation. The client is assumed to be familiar with the appropriate standards, with the concepts of conformance testing and Abstract Test Methods, and to be ready to cooperate with the test laboratory. This Recommendation specifies requirements on the client with respect to both the testability of the proposed SUT and the conduct of the conformance assessment process.

It is recommended that this Recommendation be read in conjunction with Recommendation X.290.

This Recommendation is also to published as ISO/IEC 9646-5:1994.

**Recommendation X.294**

# OSI CONFORMANCE TESTING METHODOLOGY AND FRAMEWORK FOR PROTOCOL RECOMMENDATIONS FOR ITU-T APPLICATIONS – REQUIREMENTS ON TEST LABORATORIES AND CLIENTS FOR THE CONFORMANCE ASSESSMENT PROCESS[1)]

*(Geneva, 1992; revised in 1995)*

## 1 Scope

**1.1** This Recommendation specifies requirements on both the test laboratory and the client, for the conduct of the conformance assessment process. The requirements are those necessary to achieve comparability of results of tests on similar implementations performed by different test laboratories. Implementations could support one base specification only, multiple base specifications or one or more profile(s) based on one or more base specifications. This Recommendation also provides some guidance on the conformance assessment process.

**1.2** The requirements include:

a) requirements for the testability of the implementation with respect to Abstract Test Methods;

b) general requirements on the test laboratory and the client applicable to any conformance assessment process;

c) exchange of technical and administrative information, including a System Conformance Statement, an Implementation Conformance Statement for each relevant base or profile specification, and Implementation extra Information for Testing for each Abstract Test Suite (ATS) to be used for testing each base specification, combination of base specifications or component of each profile, as appropriate, plus for profile testing the Profile Test Specification Summary for each profile;

d) cooperation between the test laboratory and the client to reach an agreement on the definition of the Implementation under Test, on the Abstract Test Methods and ATSs to be used and on the conditions under which testing will be performed;

e) requirements for the structure and content of the conformance test reports that document the results of the conformance assessment process.

**1.3** This Recommendation is applicable equally to those test laboratories which are affiliated to suppliers or procurers, and those which are independent.

**1.4** This Recommendation is applicable to conformance assessment of implementations of:

– OSI and Integrated Services Digital Network (ISDN) base specifications that comply with the relevant requirements for testability in Recommendation X.291; and/or

– OSI and ISDN profile specifications that comply with the relevant requirements for testability in Recommendation X.295,

based on:

– conformance testing specifications specified in compliance with Recommendation X.291; and

– if appropriate, based on Profile Test Specification Summaries and Profile Specific Test Specifications specified in compliance with Recommendation X.295; and

– using Means of Testing (MOT) in compliance with Recommendation X.293.

---

1) Recommendation X.294 and ISO/IEC 9646-5, Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 5: Requirements on test laboratories and clients for the conformance assessment process, are technically aligned.

**1.5** The following are outside the scope of this Recommendation:

a) the production of diagnostic trace information, additional to that in the conformance log, resulting from testing performed by the test laboratory, and the supply to the client;

b) aspects of test laboratory operations which are not specific to conformance testing implementations of OSI base specifications and profiles;

c) accreditation of test laboratories;

d) certification of implementations of OSI protocols.

## 2 References

The following Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision: all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of currently valid ITU-T Recommendations is regularly published.

– ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model.*

– ITU-T Recommendation X.210 (1993) | ISO/IEC 10731:1994, *Information technology – Open Systems Interconnection – Conventions for the definition of OSI services.*

– ITU-T Recommendation X.290 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – General concepts.*

  ISO/IEC 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts.*

– ITU-T Recommendation X.291 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T Applications – Abstract test suite specification.*

  ISO/IEC 9646-2:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 2: Abstract test suite specification.*

– CCITT Recommendation X.292 (1992), *OSI conformance testing methodology and framework for protocol Recommendations for CCITT applications – The tree and tabular Combined Notation (TTCN).*

  ISO/IEC 9646-3:1992, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 3: The Tree and Tabular Combined Notation (TTCN).*

  ISO/IEC 9646-3:1992/Amd 1[2)], *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 3: The Tree and Tabular Combined Notation (TTCN) – Amendment 1: TTCN extensions.*

– ITU-T Recommendation X.293 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications –Test realization.*

  ISO/IEC 9646-4:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 4: Test realization.*

– ITU-T Recommendation X.295 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Protocol profile test specification.*

[2)] To be published.

ISO/IEC 9646-6:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 6: Protocol profile test specification.*

– ITU-T Recommendation X.296[3)], *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – Implementation conformance statements.*

ISO/IEC 9646-7:1995, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation conformance statement.*

## 3 Definitions

For the purposes of this Recommendation, all the definitions given in Recommendation X.290 apply. The definitions in this clause also apply to this Recommendation.

**3.1 client checklist:** A record of test-related information supplied to the test laboratory by the client during the test preparation phase of the conformance assessment process.

**3.2 client test manager:** The person identified by the client organization as being responsible for all matters relating to the conformance testing of the IUT.

**3.3 negotiated exit (from the conformance assessment process):** A point in time at which the test laboratory and the client can mutually decide to terminate the conformance assessment process.

**3.4 operator of the system under test; SUT operator:** The person or persons designated by the client organization as being responsible for operation of the SUT during conformance testing.

**3.5 test laboratory checklist:** A record of test-related information supplied to the client by the test laboratory during the test preparation phase of the conformance assessment process.

**3.6 test laboratory manager:** The person identified by the test laboratory as being responsible for all matters relating to test laboratory operations.

**3.7 test operator:** The person or persons designated by the test laboratory as being responsible for running conformance tests against the IUT.

## 4 Abbreviations

For the purposes of this Recommendation, the following abbreviations defined in clause 4/X.290, clause 4 apply:

| | |
|---|---|
| ASP | Abstract Service Primitive |
| ATM | Abstract Test Method |
| ATS | Abstract Test Suite |
| BIT: | Basic Interconnection Test |
| ICS | Implementation Conformance Statement |
| IXIT | Implementation extra Information for Testing |
| IUT | Implementation under Test |
| MOT | Means of Testing |
| MPyT | Multi-Party Testing |
| OSI | Open Systems Interconnection |
| PCO | Point of Control and Observation |
| PCTR | Protocol Conformance Test Report |
| PETS | Parameterized Executable Test Suite |

3) Presently at the stage of draft.

| | |
|---|---|
| PICS | Protocol Implementation Conformance Statement |
| PIXIT | Protocol Implementation Extra Information for Testing |
| RL | Requirements List |
| PSTS | Profile Specific Test Specification |
| PTS | Profile Test Specification |
| SATS | Selected Abstract Test Suite |
| SCS | System Conformance Statement |
| SCTR | System Conformance Test Report |
| SUT | System under Test |
| TCP | Test Coordination Procedures |
| TMP | Test Management Protocol |
| XRL | IXIT Requirements List |

# 5 Overview of the conformance assessment process

## 5.1 Introduction

Figure 1/X.290 illustrates the conformance assessment process. Subclause 6.3/X.290 provides an overview of the conformance assessment process. An overview of the three phases (preparation for testing, test operations and test report production) is given as guidance in the following subclauses.

## 5.2 Preparation for testing

The preparatory phase includes:

a) general administrative steps, such as the application by the client, the provision of documents by the test laboratory describing the general policy, terms and conditions to be followed during test operations, and the provision of information about the System under Test (SUT) by the client;

b) checking the completeness of the documents provided by the test laboratory [Implementation extra Information for Testing (IXIT) proforma(s)], of those provided by the client [Implementation Conformance Statements(s) (ICS(s)], IXIT(s), System Conformance Statement (SCS), and also any other information exchanged between the test laboratory and the client; in particular, the preparatory phase for a profile also includes checking completeness of the profile related documents provided by the test laboratory (profile IXIT proforma), and those provided by the client (profile ICS and profile IXIT, SCS);

c) analysis of the configuration of the SUT and choice of a conformance testing specification(s) for the base specification(s) and profiles, if any, to be tested, either agreeing that the SUT and the test laboratory's Means of Testing (MOT) are both capable of supporting the test method(s), or using a negotiated exit if an agreement cannot be reached;

d) preparation of the SUT and the MOT for the testing configuration that results from the choice of test method(s).

Requirements for test preparation, on both the test laboratory and the client, are given in clause 6.

## 5.3 Test operations

During the second phase, the test operations are carried out. These include:

a) the static conformance review, during which detailed analysis of the ICS(s) and IXIT(s) takes place;

b) test selection and parameterization, applied to the executable (or abstract) test suite(s); this determines the Parameterized Executable Test Suite(s) [PETS(s)] that will be executed;

c) one or more test campaigns, running:

1) Basic Interconnection Tests (optional);

2) capability tests;

3) behaviour tests.

If difficulties are encountered during test operations, it is possible for the client and test laboratory to negotiate a repetition of a test campaign as a whole or in part. Alternatively, they can take a negotiated exit from the conformance assessment process.

NOTE – The reasons for the negotiated exit are documented in an informal test report.

Requirements for test operations, on both the test laboratory and the client, are given in clause 7.

### 5.4 Test report production

The third phase, which may begin before the test operations are complete, involves the presentation of the results of the conformance assessment process. These results are recorded in Protocol Conformance Test Reports (PCTRs) with a summary in a System Conformance Test Report (SCTR). Requirements for proformas for these test reports are specified in Annexes B and A respectively.

Requirements for test report production are given in clause 8.

## 6 Preparation for testing

### 6.1 Introduction

This clause specifies requirements for test preparation on both the test laboratory and the client. Figure 1 illustrates the preparatory phase of the conformance assessment process. During this phase, both parties ensure that the required documentation [including SCS, ICS(s) and IXIT(s)] is completed to their mutual satisfaction. Furthermore, checklists are provided for both parties to help them ensure that they have all the information they need prior to beginning the test operation phase. Each party shall provide the other with all the information indicated in their own checklist. In particular, the characteristics of the SUT which determine its configurations and affect the choice of test method(s) shall have been precisely defined. It is assumed that the requirements for SUT testability have been met by the client before approaching the test laboratory.

As a prerequisite to test operations, the client and the test laboratory agree on the test method(s) and the conditions for the test campaign. If an agreement is reached, the test laboratory will select the MOT for the chosen test method, and proceed to the test operations phase; otherwise, a negotiated exit may be taken.

### 6.2 Requirements for testability of the System under Test

#### 6.2.1 Client role

##### 6.2.1.1 General

The client shall ensure that the SUT is testable using at least one test method for each base specification implemented in the Implementation under Test (IUT).

If the IUT includes multi-party protocol(s), then the client shall ensure that the SUT is testable using appropriate Multi-Party Testing (MPyT) test methods using the appropriate numbers of Lower Testers.

NOTE – This Recommendation does not constrain the client to agree to any particular test method(s), as long as at least one test method is made possible by appropriately configuring the SUT.

Each of the Abstract Test Methods described in clause 11/X.291, imposes particular requirements on the SUT with respect to its testability. The requirements vary according to the test method.

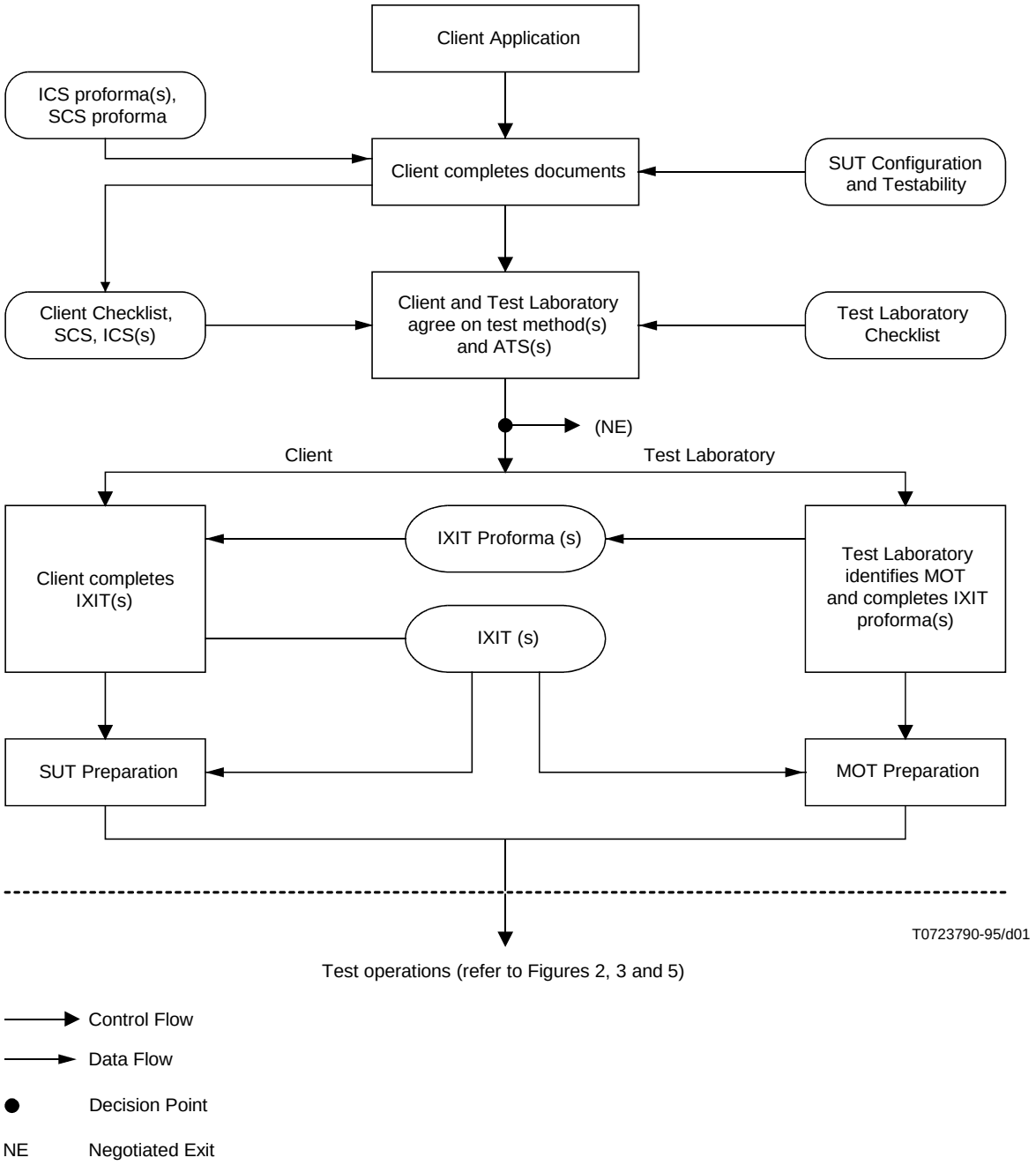


FIGURE 1/X.294

**Preparation for Testing**

For each test method by which the client claims the SUT can be tested, the client shall ensure that the SUT provides the necessary means of control and observation and that it can enable the appropriate Test Coordination Procedures (TCP) to be performed.

Further requirements for SUT testability for each of the Single-Party Testing (SPyT) Abstract Test Methods are stated below. The MPyT test methods may impose appropriate combinations of the requirements for the SPyT test methods, depending on the nature of the Upper Tester(s) and TCP used in each MPyT test method.

#### 6.2.1.2 Local test method

**6.2.1.2.1** For the Local test method, the client shall ensure that the IUT upper interface is realized in hardware and can be connected to a test system.

NOTE – The only requirements are that the interface is standardized and that there is a well-defined mapping between the relevant ASPs and the hardware interface.

**6.2.1.2.2** There are no requirements on the client for the TCP.

#### 6.2.1.3 Distributed test method

**6.2.1.3.1** For the Distributed test method, the client shall ensure that the SUT contains the means of generating, and indicating the receipt of, the Abstract Service Primitives (ASPs) for the relevant Points of Control and Observation (PCOs), that are appropriate to the envisaged IUT.

NOTES

1 The only requirements are that means be realized within the SUT for the control and observation of the effects of the relevant ASPs and that the upper service boundary of the IUT is either a human-user interface or a standardized programming language interface.

2 Any realization will satisfy this requirement provided that the appropriate ASPs can be generated and detected unambiguously. Example realizations are: pushing buttons, observing and controlling activities of OSI protocols which use the service primitives concerned, observing activity on peripherals and so on. There may be a one-to-one, one-to-many, or many-to-one correspondence between the means within the SUT and ASPs provided that there is no ambiguity about which ASPs are detected and generated.

**6.2.1.3.2** The client shall ensure that notification of the occurrence of ASP events within the SUT can be communicated by the SUT operator to the test operator (at the test laboratory) when required by the TCP.

NOTE – The means for transferring notification of the occurrence of generated and observed ASP events to the test laboratory is outside the scope of Recommendations X.290 to X.296, but could be achieved by the use of a separate communication channel, e.g. voice, telephone call, data call, etc. The way in which this communication takes place constitutes part of the informal TCP, and is stated by the client in the client checklist when applying to the test laboratory for conformance assessment.

#### 6.2.1.4 Coordinated test method

**6.2.1.4.1** For the Coordinated test method, the client shall ensure that the SUT can support at least one Upper Tester that is an implementation of the standardized Test Management Protocol (TMP) for the appropriate base specification(s).

NOTE – This requirement does not imply the implementation within the SUT of a real OSI service boundary with real service primitives.

**6.2.1.4.2** Once an Abstract Test Suite (ATS) specification for the Coordinated test method has been chosen during test preparation, the client shall ensure that the SUT supports an Upper Tester which realizes the TMP for this ATS specification.

NOTE – The client may use the assistance of the test laboratory during test preparation in order to meet this requirement. Alternatively, the client may choose to implement the Upper Tester and TMP for a particular ATS specification within the envisaged IUT before approaching a test laboratory for conformance assessment.

#### 6.2.1.5 Remote test method

**6.2.1.5.1** For the Remote test method, once an ATS specification is chosen during test preparation, the client shall document in the IXIT(s) the degree of control and observation that is possible within the SUT to achieve the TCP that are stated informally in the ATS specification.

NOTE – Of all the test methods, the Remote testing method imposes the fewest constraints on the SUT. The SUT, however, is expected to perform in accordance with the claims made in the IXIT(s). These claims may imply some degree of control, for example, where the SUT is required to initiate some event.

**6.2.1.5.2** For those test events for which a claimed of degree of control or observation has been made in the IXIT(s), the client shall ensure that notification of the occurrence of such test events within the SUT can be communicated by the SUT operator to the test operator (at the test laboratory), when required by the TCP.

NOTE – The means for transferring notification of the occurrence of generated and observed test events to the test laboratory is outside the scope of Recommendations X.290 to X.296, but could be achieved by the use of a separate communication channel, e.g. voice, telephone call, data call, etc. The way in which this communication takes place constitutes part of the informal TCP, and is stated by the client in the client checklist when applying to the test laboratory for conformance assessment.

## 6.3 Communication between the test laboratory and the client

### 6.3.1 Test laboratory and client checklists

#### 6.3.1.1 Introduction

During test preparation, the test laboratory and client exchange test-related information in order that they can agree on the definition of the IUT and on the choice of test method(s) and ATS specification(s) to be used during testing. The information to be provided, some of which may be assembled as a result of discussions, is specified in a test laboratory checklist and a client checklist. Based on the exchange and review by both parties of the information indicated in the checklists, an agreement can be reached on whether or not to proceed with the test preparation phase. An agreement might not be reached if the test laboratory is unable to offer a testing service which is compatible with the client's proposed IUT. If both parties agree to continue, the documents required for conformance assessment are prepared (refer to 6.4).

#### 6.3.1.2 Test laboratory role

During the test preparation phase of the conformance assessment process, the test laboratory shall provide the client with all information indicated in the following test laboratory checklist:

a) requirements placed on the client by the test laboratory, concerning the provision of the SCS, ICS(s) and IXIT(s), plus the relevant IXIT proformas;

b) statement of compliance with this Recommendation;

c) Abstract Test Method(s) supported for each base specification or combination of base specifications for which a testing service is offered;

d) statement of conformance with the conformance testing specifications and in the case of profile testing the Profile Test Specification Summary (PTS-Summary) and Profile Specific Test Specification (PSTS), for which a testing service is offered;

e) statement of whether or not the test laboratory offers a comprehensive conformance testing service as defined in each of the applicable conformance testing specifications and in Recommendation X.291;

f) limitations, if any, of the Lower Tester(s), for the supported test methods that are relevant to the client's SUT;

g) specifications of the upper tester, if applicable, and the TCP for the supported test methods that are relevant to the client's SUT;

h) description of the test laboratory procedures which are related to running the tests during the test campaign and which are relevant to the client, particularly those to be performed by the SUT operator;

i) references to all documentation to be used and produced by the test laboratory during the conformance assessment process.

NOTE – The test laboratory may provide the client with:

a) information on the testing services offered relevant to the range of base specifications and profiles of interest to the client;

b) assistance in the implementation of an upper tester, if applicable for the chosen test method;

c) ICS proformas:

d) SCS proforma;

e) information on whom to contact to obtain any other necessary information;

f) estimates of the time required to complete the test operations and test report production phases of the conformance assessment process;

g) statement of test laboratory accreditation (if applicable).

#### 6.3.1.3 Client role

During the test preparation phase of the conformance assessment process, the client shall provide the test laboratory with all the information indicated in the following client checklist:

a) statement of compliance with this Recommendation;

b) specification of what part of the SUT is proposed to be the IUT and which base specification(s) and/or profile(s) are to be tested;

c) a claim of SUT testability based on specific Abstract Test Method(s) and/or ATS specification(s);

d) a statement of the TCP that are suitable for use with this IUT, and which correspond to the proposed test method(s).

NOTE – The client may provide the test laboratory with:

a) information on any physical requirements for the SUT (e.g. space, air conditioning, etc.) if relevant, and any other practical information that may be needed during the conformance assessment process;

b) information on whom to contact during the conformance assessment process.

### 6.3.2 Agreement on test methods and selection of test suites

#### 6.3.2.1 Test laboratory role

The test laboratory shall review the client checklist and shall determine if the test laboratory offers a testing service which is applicable to the client's proposed IUT. The test laboratory shall accommodate the client's choice of test method for each base specification or combination of base specifications in the proposed IUT (see 6.3.2.2) and shall select the corresponding reference ATS specification (including if relevant the TMP specification and/or PSTS) to be used in the conformance assessment process.

For each PTS-Summary ATS specification selected, the test laboratory shall identify and use an MOT which conforms with that ATS specification and for profile testing the PTS-Summary, and which complies with Recommendation X.293.

For each test case in a PSTS, the test laboratory shall identify and use an MOT which conforms with the requirements for that test case and complies with Recommendation X.293.

NOTE – The conformance testing specification(s) used should have the highest available standardization status (see clause 5/X.291).

#### 6.3.2.2 Client role

The client shall review the test laboratory checklist and shall make the choice of which test method(s) should be used for each base specification or combination of base specifications in the proposed IUT in accordance with the claims for SUT testability and the testing service offered by the test laboratory.

NOTE 1 – The client may wish to select test method(s) which impose no additional requirements on the SUT other than those contained in the base specifications or profiles to which the SUT claims to conform. In this case, the client should select a test laboratory which provides a comprehensive testing service. (See 11.6.2/X.291 and 9.1 of this Recommendation.)

An IUT can consist of a single protocol entity or multiple protocol entities. If the IUT is multi-protocol, then embedded test methods should be used incrementally. (See 7.6/X.290.)

NOTE 2 – Several IUTs can be defined in the SUT if several conformance assessments are to be performed on the same SUT for different combinations of base specifications and test methods.

#### 6.3.2.3 Mutual role

After both parties have reviewed the information provided in the checklists, in order that the conformance assessment process can continue, both parties shall agree on:

a) the accuracy and sufficiency of the information provided in the checklists;

b) the definition of the IUT;

c) the test method(s) and the corresponding ATS specification(s) which will be used for the conformance assessment process.

If an agreement cannot be reached, a negotiated exit should be taken in order to terminate the conformance assessment process. If an agreement is reached, what has been agreed shall be recorded in the SCTR issued at the end of the conformance assessment process.

### 6.3.3 Management of technical issues

There are no general requirements concerning procedures for the resolution of technical issues between the client and test laboratory that may arise during the conformance assessment process. However, should differences be discovered between the conformance testing specification and the base specification(s), the base specification(s) shall have precedence in problem resolution.

NOTE – Unresolved issues of a technical nature, related to the interpretation of relevant specification, can be referred to the appropriate specification defining group in ITU-T or ISO/IEC.

## 6.4 Documentation for conformance assessment

### 6.4.1 Overview

After the test laboratory and client have agreed on the definition of the IUT and on the test method(s) and ATS specification(s) to be used during the conformance assessment, they exchange detailed information about the SUT. This information resides in a set of documents related to test preparation: the ICS(s), IXIT(s), SCS and TMP Implementation Statement, if any. Thus, for a profile, the information resides in the following set of documents related to test preparation:

- the profile ICS;
- the profile IXIT;
- the SCS; and
- the TMP implementation statement (if any).

Requirements on both the client and test laboratory related to the production and exchange of these documents are stated below.

### 6.4.2 Implementation Conformance Statement (ICS)

#### 6.4.2.1 Content of the ICS

Detailed information on the role and scope of the ICS is given in 5.6/X.290, and basic guidance on the design of the ICS proforma is given in Recommendation X.296.

A Protocol Implementation Conformance Statement (PICS) proforma is contained in each OSI protocol specification which complies with the requirements of Recommendation X.291 for testability. An information object ICS proforma should accompany each information object specification. Requirements applicable to a transfer syntax (abstract syntax and encoding rules) are stated in the specification of the protocol and hence should be covered in the relevant PICS.

#### 6.4.2.2 Test laboratory role

There is no requirement on the test laboratory for the provision of ICS proformas for use by the client. However, the test laboratory may provide copies of the relevant ICS proformas if necessary.

#### 6.4.2.3 Client role

The client shall provide a PICS for each OSI protocol specification which is implemented in the IUT and for which conformance is to be tested. The client shall provide an information object ICS for each information object which is implemented in the IUT and for which conformance is to be tested.

The client shall complete the relevant ICS proformas from the relevant OSI specifications. The requirements for the provision of ICS information are stated in the relevant specifications.

### 6.4.3 Profile Implementation Conformance Statement

#### 6.4.3.1 Content of the profile ICS

Detailed information on the role and scope of the profile ICS is given in 5.6.3/X.290, and basic guidance on the construction and use of the profile ICS is given in Recommendation X.296.

The profile specific ICS proforma, if any, and profile Requirements List (RL) are part of the profile specification.

#### 6.4.3.2 Test laboratory role

There is no requirement on the test laboratory concerning the provision of the profile RL and related base specification ICS proformas, on which the profile ICS will be based, for use by the client. However, the test laboratory may provide copies of the relevant base specification and profile specific ICS proformas and profile RL if necessary.

#### 6.4.3.3 Client role

The client shall provide a profile ICS for the profile which is implemented in the IUT and for which conformance is to be tested.

The client shall complete the relevant profile ICS proforma. The requirements for the provision of the relevant ICS information are stated in the relevant specifications and the profile RL.

### 6.4.4 Implementation extra Information for Testing (IXIT)

#### 6.4.4.1 Content of the IXIT

The role and scope of the IXIT are given in 6.2/X.290, and for profile related issues additions are given in Recommendation X.295. An IXIT template is given in Appendix I to give guidance on the production of IXIT proformas.

#### 6.4.4.2 Test laboratory role

The test laboratory shall produce an IXIT proforma for each ATS (or set of ATSs) for which testing is offered. The following list of information shall be included:

a) identification of the IXIT (e.g. name, number, date of issue, issued to);

b) identification of the ATS(s) (e.g. reference, Abstract Test Method);

c) identification of the test laboratory (e.g. name, test laboratory manager, technical authority, accreditation status);

d) identification of the MOT (e.g. name, version);

e) identification of the client (e.g. name, client test manager, required test facilities);

f) identification of the SUT (e.g. name, version, SCS, configuration, operating system, Upper Tester identification, date of Upper Tester validation);

g) information about the ancillary protocols [e.g. name, version, ICS reference(s), IXIT reference(s), PCTR reference(s)];

h) augmented partial IXIT proforma accompanying the MOT and associated with the reference ATS(s).

The test laboratory shall provide an IXIT proforma to the client for each ATS (or set of ATSs) that is to be used during the conformance assessment process. Before issuing the IXIT proforma to the client, the test laboratory shall complete the information of a), b), c), and d) above.

In case of profile testing, the test laboratory shall produce a profile IXIT proforma for each profile to be tested. This implies that besides the production of the IXIT proforma(s) for the ATS(s), the test laboratory shall produce the profile specific IXIT proforma and the profile IXIT Requirements List (XRL). The test laboratory shall ensure consistency of the cross references between the XRL and the IXIT proformas.

NOTE – The test laboratory could produce the profile IXIT proforma by either producing separate IXIT proforma(s), profile specific IXIT proforma and XRL documents or by merging them together into just one document.

#### 6.4.4.3 Client role

The client shall provide an IXIT to the test laboratory providing the information of e) and f) of the list in 6.4.4.2 above.

#### 6.4.4.4 Mutual role

Test laboratory and client should fill out in collaboration the information of g) and h) of 6.4.4.2 above. For profile testing they should use the supplied profile XRL when doing this.

### 6.4.5 System Conformance Statement (SCS)

#### 6.4.5.1 Content of the SCS

The SCS gives a summary of the protocols, profiles and information objects to which the IUT claims to conform. It also provides references to the ICS(s) and references to related test reports (if any).

The role and scope of the SCS, as well as the general requirements and use of the SCS are described in Recommendation X.296.

The SCS provided with the SUT may indicate if the SUT is a complete or partial (N)-open system, if it is to be tested as an end system or a relay system, and what protocols are within the SUT but not part of the IUT. For instance, if the IUT is an implementation of an Application profile covering the Application, Presentation and Session layers, the SCS may indicate which protocols or profiles are used to provide the Transport service.

#### 6.4.5.2 Test laboratory role

The test laboratory may provide an SCS proforma to the client. If so, it shall comply with the relevant requirements in Recommendation X.296.

#### 6.4.5.3 Client role

The client shall provide to the test laboratory an SCS as described in 6.4.6.2.

### 6.4.6 Test Management Protocol (TMP) implementation statement

#### 6.4.6.1 Content of the TMP Implementation statement

The role and scope of the TMP implementation statement is given in clause 13/X.291. A proforma for the TMP implementation statement is contained in the TMP part of each conformance testing specification which uses the SPyT Coordinated Abstract Test Method or which uses a TMP in the MPyT context.

#### 6.4.6.2 Test laboratory role

The test laboratory shall provide the client with the proforma for the TMP implementation statement for each ATS specification which uses a TMP and which will be used during conformance assessment.

#### 6.4.6.3 Client role

The client shall provide a TMP implementation statement for each ATS specification which uses a TMP and which is to be used for testing. This is done by completing the relevant proforma provided by the test laboratory.

# 7 Test operations

## 7.1 Introduction

Clause 7 specifies requirements for test operations. Figure 2 shows typical test operations. For the purpose of this clause, it is assumed that the IUT is being tested using a single standardized ATS specification. However, this clause does not exclude the IUT being tested by multiple ATSs or by a Profile Test Specification (PTS).

NOTE – See Figure 3 for typical test operations for profile testing.

If the IUT is to be tested using multiple ATSs or a PTS, then there shall be a single static conformance review covering all relevant ICSs and IXITs, followed by the following sequence of test operations for each ATS (or separate test suite for a PSTS) in turn:

a) test selection;

b) test parameterization;

c) TCP verification;

d) test campaign.

The order of executing the different ATSs should be from those testing the lowest protocol(s) to those testing the highest.

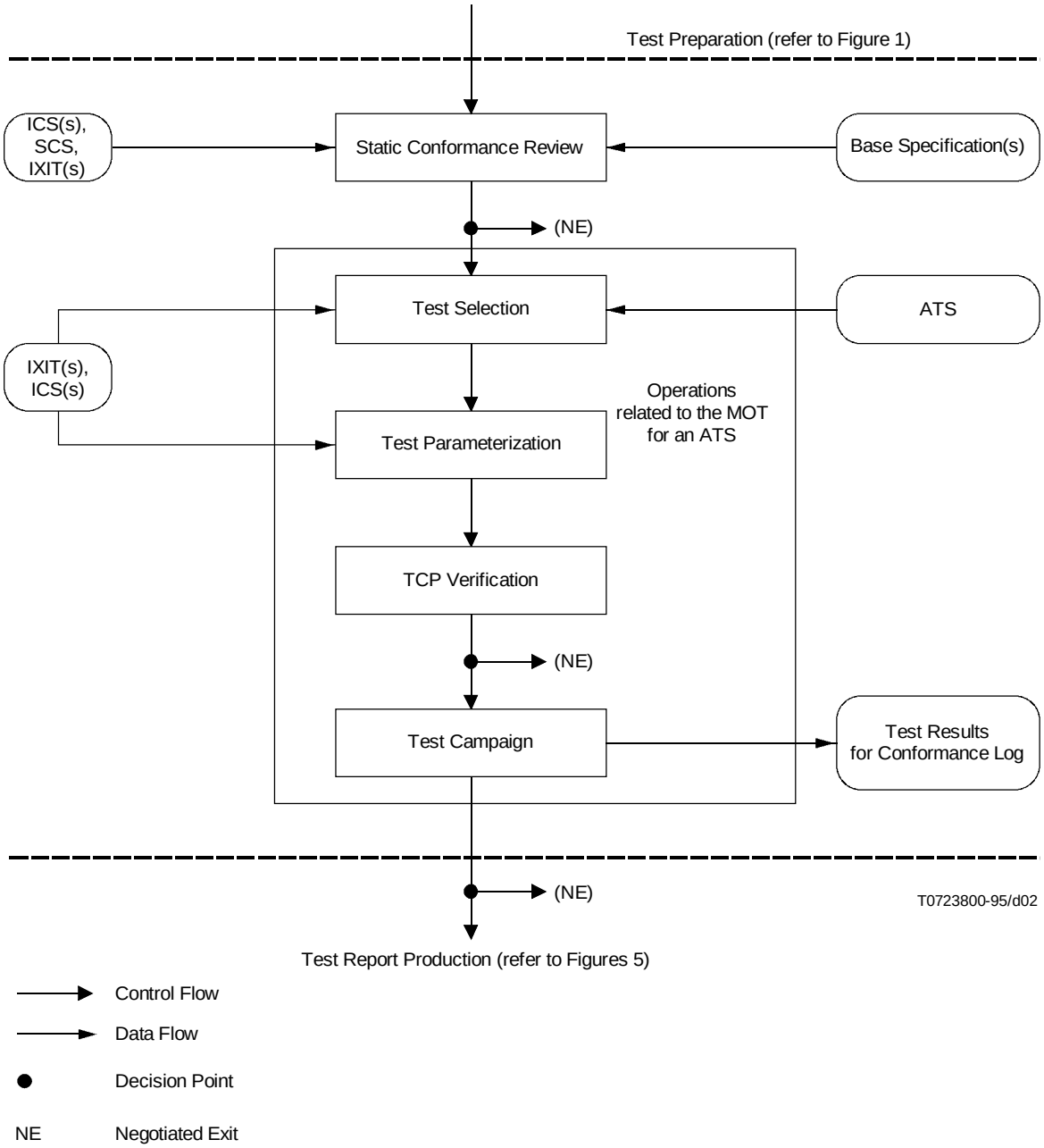


FIGURE 2/X.294

**Typical Test Operations for a single ATS**

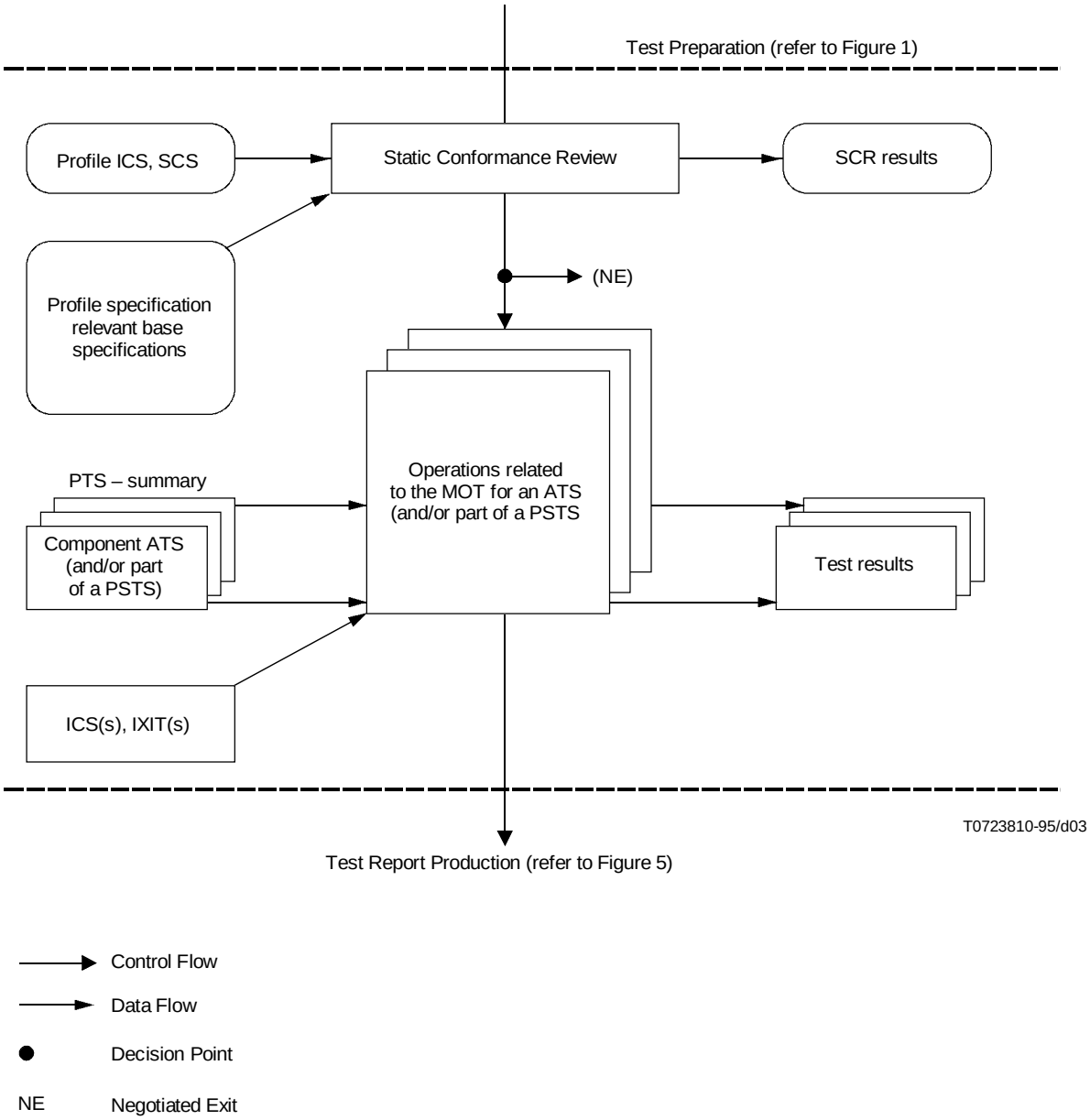


FIGURE 3/X.294

**Typical Tes Operations for Profile Testing**

## 7.2 Static conformance review

### 7.2.1 Test laboratory role

**7.2.1.1** During the static conformance review, the test laboratory shall analyse the ICS(s) according to the following criteria:

a) the ICS(s) shall be self-consistent;

b) the ICS(s) shall be consistent with the static conformance requirements specified in the base specification(s) to which the IUT is claimed to conform;

c) in the case of a profile, the profile ICS shall be consistent with the profile RL.

**7.2.1.2** In the case of a profile ICS, the status values of the ICS proforma(s) are modified by applying the profile RL. In all cases the status values and any other static conformance requirements and the support answers of the ICS(s) shall be checked for consistency. These shall include:

a) For each item which has a status value of ‘‘m’’ (i.e. mandatory), check that the support answer is yes (e.g. ‘‘Y’’).

b) For each item which has a status value of ‘‘o’’ (i.e. optional), check that the support answer is not ‘‘no answer required’’ (i.e. ‘‘–’’).

c) For each set of items which have a status value of ‘‘o.n’’(i.e. a set of related options), check that the support answers are consistent with the requirements (e.g. at least one is supported, or precisely one is supported).

d) For each item which has a conditional status value, evaluate the condition in order to determine the effective status value and then perform the check which is appropriate to that status value.

e) For each item which has a status value of ‘‘x’’ (i.e. prohibited), check that the support answer for sending is no (e.g. ‘‘N’’).

NOTE – A status value of ‘‘x’’ should not normally be used for receipt (see Recommendation X.296).

f) Apply the additional static conformance review checks, if any, which are specified explicitly in the ICS proforma itself.

**7.2.1.3** No additional checks are needed for items which have a status value of:

a) not applicable (e.g. ‘‘n/a’’ or ‘‘–’’);

b) out of scope (i.e. ‘‘i’’),

since all support answers, including ‘‘no answer required’’ (i.e. ‘‘–’’), are allowed for such items.

**7.2.1.4** The test laboratory shall also check the consistency of the information presented in the IXIT(s) and SCS documents provided by the client.

**7.2.1.5** The test laboratory shall inform the client of the results of the static conformance review before continuing with the conformance assessment process.

### 7.2.2 Client role

The client shall review the results of the static conformance review.

### 7.2.3 Mutual role

If the results of the static conformance review reveal that, in the view of either the test laboratory or the client, to proceed with testing would not be productive, then a negotiated exit may be taken.

## 7.3 Test selection

### 7.3.1 Test laboratory role

See Figure 4.

For each chosen ATS (or test suite within the PSTS), test selection begins with the complete test suite.

In the case of profile testing, the test cases from the ATS which are appropriate to the profile are listed in the PSTS. The test cases identified in this list are obtained by applying the deletions, additions and replacements with respect to the ATS, as are specified in the PSTS (see clause 9/X.295).

In all other cases the ATS remains unchanged.

The “ATS reference” column of the PCTR proforma shall be completed by listing all the test cases of the ATS in the order stated in the ATS specification. In the case of profile testing, any additional test cases from the PSTS and relevant to the ATS are listed in the PCTR proforma in the order stated in the PSTS after those of the ATS; any replacement test cases from the PSTS are listed in the PCTR proforma immediately after the corresponding replaced test case; any replaced or deleted test cases are denoted in the PCTR proforma by putting “N/A” or “–” in the “selected” column of the PCTR proforma.

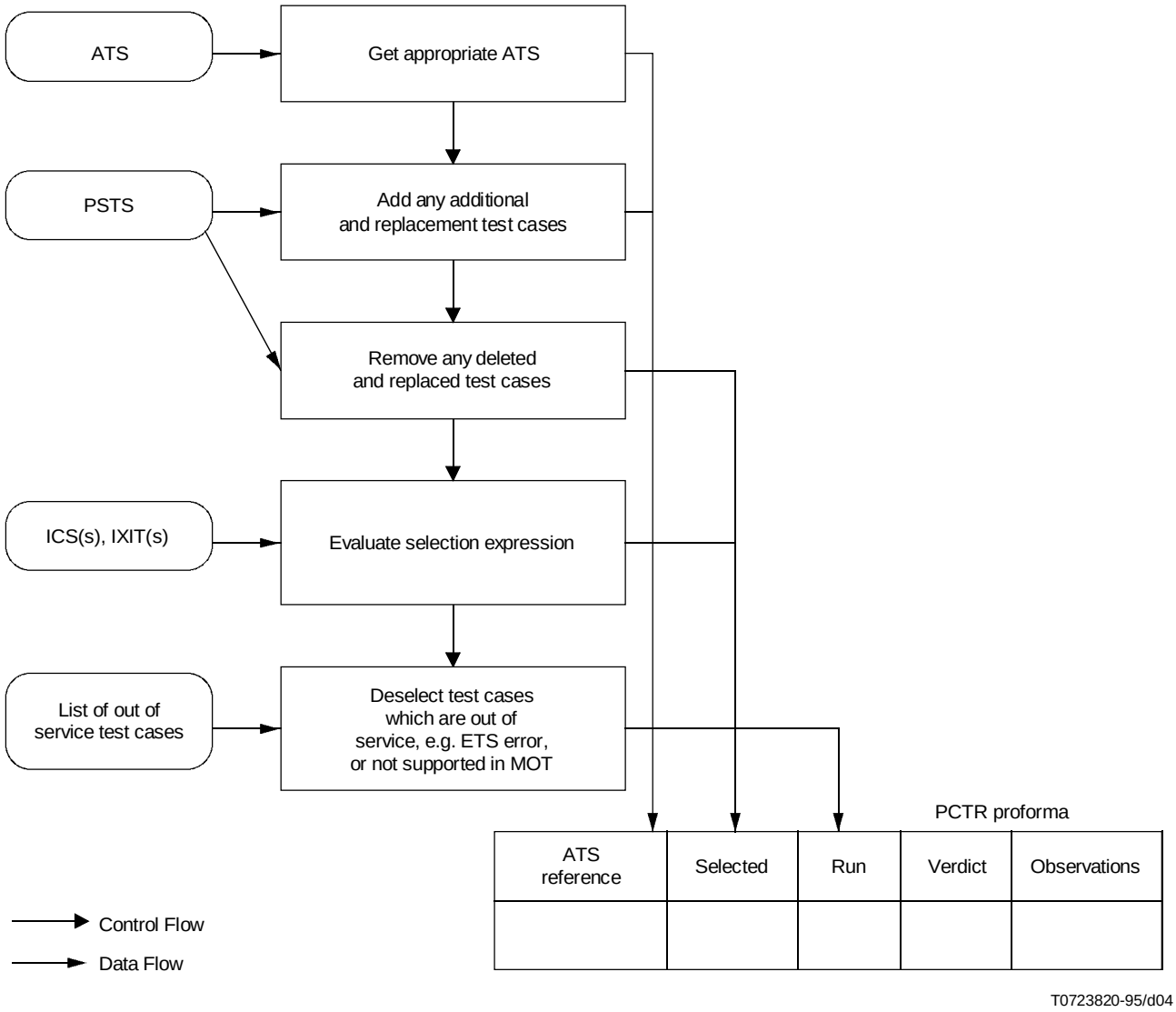


FIGURE 4/X.294

**Test selection process and listing test cases in the PCTR proforma**

The selection expressions associated with the relevant test cases shall be evaluated using the IUT's ICS(s) and IXIT(s) to deselect those test cases inappropriate to the IUT. The IXIT(s) shall then be checked to ensure that all the remaining test cases can be executed with the SUT, any that cannot shall be deselected. The results of this selection process are recorded in the selected column of the PCTR.

The test laboratory shall then deselect test cases, if any, which are out of service for some reason (e.g. ETS error or MOT problems) and record them in the run column of the PCTR as not run.

The above process is shown in schematic form in Figure 4.

The resulting ATS shall cover the following:

a) all capability test cases for mandatory capabilities;

b) all capability test cases for optional or conditional capabilities that are claimed to be supported by the IUT according to the ICS(s);

c) all behaviour test cases for mandatory capabilities;

d) all behaviour test cases that are consistent with the optional or conditional capabilities that are claimed to be supported by the IUT according to the ICS(s).

#### 7.3.2 Client role

The client shall inform the test laboratory whether or not Basic Interconnection Testing should be performed during the test campaign.

NOTE – If the standardized ATS does not identify a list of Basic Interconnection Tests, the test laboratory will not be able to accommodate this request.

## 7.4 Test parameterization

### 7.4.1 Test laboratory role

**7.4.1.1** After the set of all test cases retained by test selection is determined, the information provided in the IXIT(s) shall be used to determine the appropriate values for each parameter in those test cases, in accordance with the documentation of the MOT and with the requirements of its reference ATS. The resulting Parameterized Executable Test Suite(s) [PETS(s)] is then ready to be executed, or to be generated on request.

Information from the IXIT(s) [and if necessary from the ICS(s)] is used in the parameterization process. Examples of types of parameterization are:

a) values of network addresses;

b) values of connection end point identifiers;

c) values of counters;

d) values of timers;

e) encoding strategies.

NOTE – This list is not exhaustive.

**7.4.1.2** After parameterization, the test laboratory shall ensure that all the test cases in the Selected Abstract Test Suite(s) [SATS(s)] are present in the PETS(s).

NOTE – The parameterization performed should be validated as far as possible before capability testing takes place, for example, during basic interconnection testing.

### 7.4.2 Client role

There are no requirements on the client during test parameterization.

## 7.5 Verification of Test Coordination Procedures

### 7.5.1 Introduction

Some level of TCP is specified or implied in every ATS specification. Upon completion of the test parameterization process, it should be verified that the MOT and the SUT are able to use the required TCP in order to carry out the test campaign.

### 7.5.2 Test laboratory role

If the Local test method is to be used, or if the MPyT context is to be used, verification of the TCP used by the Lower Testers done by or for the test laboratory as part of the procedures for validating the MOT.

### 7.5.3 Mutual role

If any of the test method(s) to be used for the test campaign is an SPyT test method other than the Local or the Coordinated test method, the verification of the TCP shall be informally accomplished by the test laboratory and the client.

Similarly, if the MPyT context is to be used, verification of the TCP required of the Upper Testers, if any, shall be informally accomplished by the test laboratory and the client.

If the Coordinated test method is to be used, the test laboratory shall verify the implementation of the TMP in the SUT. This shall be achieved by selecting the applicable TMP test cases from the ATS specification, according to the TMP implementation statement, and executing them against the Upper Tester.

Regardless of the test method or the testing context, if the results of verifying the TCP are unsatisfactory to either the test laboratory or the client, then the test campaign shall not be attempted.

## 7.6 Test campaign

### 7.6.1 Introduction

A test campaign is the process of executing the PETS for a particular IUT and producing the information required for the conformance log.

### 7.6.2 Test laboratory role

#### 7.6.2.1 General

The test laboratory shall ensure that the MOT and test operator are available throughout the agreed test campaign period, shall invoke all of the test cases in the PETS, and shall produce the information required for the conformance log.

#### 7.6.2.2 Test cases previously run

If requested by the client prior to running any test cases in the test campaign, the test laboratory shall identify which, if any, of the test cases in the PETS have been run previously using the same SUT, configured in the same way, with the same MOT. If the test laboratory identifies that there are such test cases, then the test laboratory shall discuss with the client whether or not those test cases should be rerun in this test campaign. If it is decided not to rerun any such test cases, then the verdicts from the previous occasion shall be entered into the PCTR together with a statement of the period during which those test cases were actually run.

NOTE – This situation is most likely to arise when the test laboratory is testing a multi-profile non-configurable SUT for conformance to several profiles. In this case, the test cases that are common to two or more profiles for that SUT need only be run once, although their verdicts are reported in more than one PCTR.

If, in profile testing, a PETS to be run for one profile is exactly the same as a PETS run previously for a different profile with the same SUT, configured in the same way, then the PCTR resulting from the previous execution of the PETS may be referenced from the SCTR for the new profile, without any of the test cases being rerun.

If the SUT is configured differently for this test campaign, compared with all previous test campaigns for this SUT, then all the test cases shall be run afresh, and no verdicts from the previous test campaigns shall be reported in the PCTR for this test campaign.

#### 7.6.2.3 Basic Interconnection Tests (BITs)

If BITs have been selected, the test laboratory shall invoke those test cases before running further capability and behaviour test cases. The test laboratory shall inform the client of the results of the Basic Interconnection Tests before proceeding with further test cases.

NOTE – The client may wish to take a negotiated exit after analysing the results of the Basic Interconnection Tests.

#### 7.6.2.4 Analysis of verdict assignments

During the test campaign, the test laboratory shall establish for each test case in the SATS, which one of the following results applies:

a) Pass verdict;

b) Fail verdict;

c) Inconclusive verdict;

d) abstract test case error;

e) executable test case error;

f) abnormal test case termination.

NOTE 1 – If the MPyT context is used, the Lower Tester Control Function determines this by evaluating all preliminary results.

For each test case that has an abstract test case error, the test laboratory shall indicate in the PCTR that the test case was ‘‘Not Run’’ together with the reason why.

NOTE 2 – The test laboratory should progress the updating of the ATS specification to fix the error via the relevant defect reporting procedures.

For each test case that produced either an executable test case error or an abnormal test case termination result, the test laboratory shall rerun the test case (unless it is certain that the result cannot change). If the same result is produced, the test laboratory shall indicate in the PCTR that the test case was ‘‘Not Run’’ together with the reason why.

For each test case that produced an Inconclusive verdict, the test laboratory shall rerun the test case at least once. If a Pass or Fail verdict is produced during a subsequent execution, that verdict shall be recorded in the PCTR. If an Inconclusive verdict is the only verdict produced during subsequent execution(s) of the test case and the test case behaviour is the same as in previous executions, the Inconclusive verdict shall be recorded in the PCTR.

For each test case that produced a Fail verdict, the test laboratory shall assess whether the verdict was associated with an unidentified test event in the abstract test case. If this is not the case, the test laboratory shall record the Fail verdict for this test case in the PCTR. However, if this is the case, the test laboratory shall determine whether there is an abstract test case error, that is, whether the event which matched the unidentified test event was valid according to the protocol and should have been defined in the abstract test case. If so, the test laboratory shall indicate in the PCTR that the test case was ‘‘Not Run’’ together with the reason why.

While analysing the conformance log associated with a particular test case, the test laboratory might observe values in the PDUs received by the MOT which were not explicitly checked in the abstract test case. If the abstract test case does not contain explicit checks for these values, then the test laboratory shall not alter the verdict assignment because of its observation.

NOTE 3 – Any observations made by the test laboratory may be recorded in section 7 of the PCTR (see Annex B) but shall be considered only as additional information for the client.

Prior to entering the test report production phase, the test laboratory shall inform the client of any test cases for which it intends to record a Fail verdict in the PCTR.

#### 7.6.2.5 Production of conformance log

If the client requests a conformance log for the test campaign, the test laboratory shall produce one that documents the test outcome for every execution of each test case which was requested by the client, including any repeated executions.

### 7.6.3 Client role

#### 7.6.3.1 General

The client shall ensure that the SUT and, if required, an SUT operator are available throughout the agreed test campaign period. The client shall cooperate with the test laboratory to make any changes to the IUT or its environment which are required in order to enable execution of all the test cases (see 7.6.4.2) and shall review the documentation of such changes.

#### 7.6.3.2 Test cases previously run

If any of the test cases in the PETS have been run previously using the same SUT, configured in the same way, with the same MOT, the client may request the test laboratory to report the previous verdicts for such test cases, rather than rerunning them.

#### 7.6.3.3 Basic Interconnection Tests (BITs)

If BITs are to be run, the client shall review the results of that testing and inform the test laboratory if a negotiated exit is to be taken. The client should do this before the test laboratory proceeds with further testing.

#### 7.6.3.4 Analysis of verdict assignments

There are no requirements on the client concerning analysis of verdict assignments. However, during the test campaign, the client may request a rerun of any test case that produced a Fail verdict, if not satisfied that the test case correctly diagnosed an error in the IUT.

#### 7.6.4 Mutual role

##### 7.6.4.1 Test cases previously run

As the result of a request by the client, the test laboratory may identify, prior to running any test cases in the test campaign, some test cases in the PETS which have been run previously using the same SUT, configured in the same way, with the same MOT. If so, the test laboratory and client shall discuss whether or not those test cases should be rerun in this test campaign.

NOTE – In this discussion, the test laboratory and client should consider carefully the consequences of not rerunning such test cases, as well as the cost saving in not rerunning them. In particular, the acceptability to all the relevant parties of the old results needs to be considered.

##### 7.6.4.2 Changes to the test environment

Once a test campaign has started, any changes to the IUT or its environment, or to the Lower Tester and its environment, or to the Upper Tester, shall occur only if agreed by both the client and test laboratory.

For the sake of consistency of the test results, such changes shall be agreed to only if they do not invalidate the results of the test cases previously executed in that test campaign. If the changes are required in order to run test cases in the executable version of the reference ATS, then the fact that the requirement comes from the reference ATS is sufficient reason to deem that those test cases do not invalidate the results of previously executed test cases.

Any changes shall be documented by the test laboratory and reviewed by both the test laboratory manager and the client test manager. Based on this review, a decision shall be reached as to whether the test campaign is to be:

a) restarted;

b) continued, following the necessary revisions; or

c) discontinued by taking a negotiated exit.

##### 7.6.4.3 Analysis of verdict assignments

If the client requests a rerun of a test case that produced a Fail verdict, the test laboratory and client shall assess whether or not the result was caused by some error in the IUT. If they are unable to establish the existence of an error in the IUT, the test laboratory shall apply the repetition procedure for test cases yielding Inconclusive verdicts (see 7.6.2.4).

### 7.7 Negotiated exits during the test campaign

#### 7.7.1 Use of a negotiated exit

During the test campaign, a negotiated exit is a point in time when the test laboratory and the client decide together that the test results up to that point do not justify continuing the conformance assessment process. The request for a negotiated exit can be made by either party.

If a negotiated exit is taken as a consequence of a dispute over the result(s) of specific test case(s), then the negotiated exit shall take place before the assignment of verdict(s) to the disputed test case(s).

#### 7.7.2 Test laboratory role

If a negotiated exit is agreed to by both the client and test laboratory, the test laboratory shall make available to the client, on request, documentation containing all the relevant information recorded during the conformance assessment process. This documentation shall, if requested by the client, include the conformance log for the test cases that were run, as defined in 6.4/X.293.

In addition, the test laboratory shall provide an informal test report which does not assume the status of either an SCTR or PCTR. It shall be considered simply as guidance to the client on the results of the testing undertaken. This informal test report shall indicate the reasons why a negotiated exit was taken.

NOTE – When a test campaign is terminated by a negotiated exit, diagnostic testing may proceed and further diagnostic trace information, additional to that in the conformance log, may be provided to the client, but this is outside the scope of Recommendations X.290 to X.296.

### 7.7.3 Client role

If a negotiated exit is taken, there are no further requirements on the client.

NOTE – The client may request documentation containing all the relevant information recorded during the conformance assessment process, including the conformance log.

### 7.7.4 Mutual role

After a negotiated exit, conformance testing shall not be restarted except by starting a new test campaign or by initiating a new conformance assessment process.

# 8 Test report production

## 8.1 Conformance test reports

The conformance assessment process culminates in the production by the test laboratory of two types of test report: a System Conformance Test Report; and a Protocol Conformance Test Report for each ATS executed. This is illustrated in Figure 5.

The test laboratory may also produce detailed diagnostic trace information, additional to that provided in the conformance log, to accompany the test reports if requested; such information is considered to be supplemental to the test reports themselves, and there is no requirement in this Recommendation that a test laboratory shall provide it.

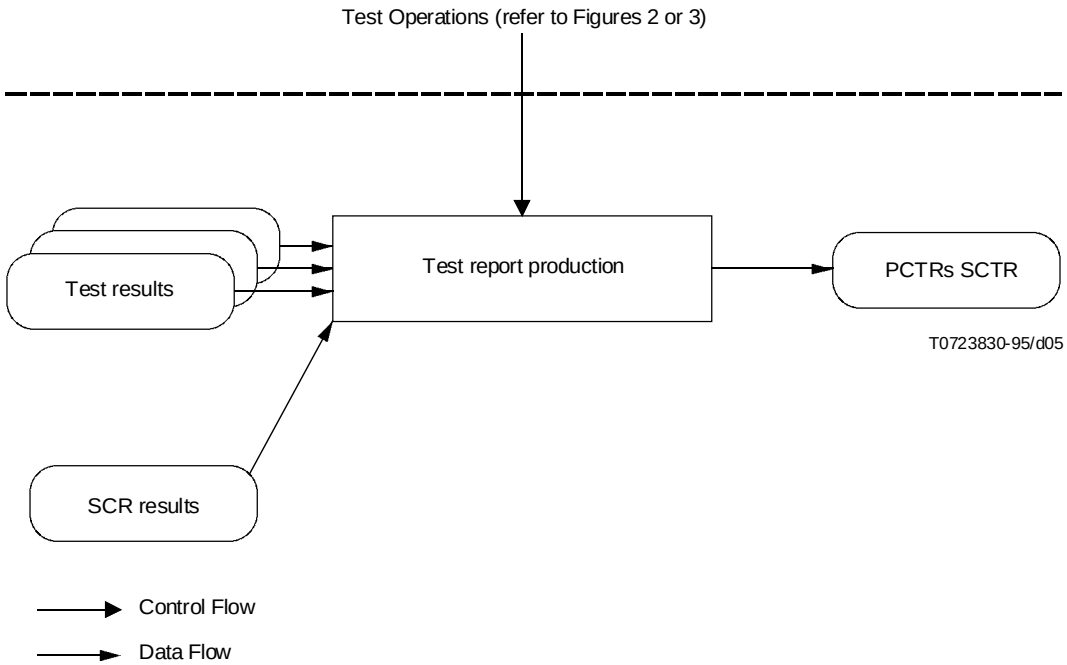


FIGURE 5/X.294

**Test report production**

## 8.2 System Conformance Test Report (SCTR)

### 8.2.1 Test laboratory role

Provided that a negotiated exit was not taken during the test campaign, the test laboratory shall produce an SCTR that provides a summary of the results of the conformance testing performed on the client's SUT. If an SUT is tested for support of more than one profile, a separate SCTR shall be produced for each profile. Where the commonality between two or more profiles is such that the selection of test cases from a given ATS is identical for several profiles (e.g. several Application PTSs may be able to use the same Session test cases), a single PCTR may be produced for that ATS and may be referenced by each of the relevant SCTRs. The test laboratory need not use an SCTR proforma in the production of an SCTR(e.g. it may generate its SCTRs directly from an SCTR tool), but if it does use an SCTR proforma, then that proforma shall conform to the SCTR template given in Annex A. In either case, the test laboratory shall produce each SCTR in conformance with the SCTR template given in Annex A.

The SCTR shall contain the list of reference ATS(s) against which testing has been carried out, together with their dates of publication and, if applicable, details of any amendments or addenda with which the IUT is claimed to conform.

The SCTR shall explain briefly the nature of OSI testing and in particular that there is no guarantee that an SUT that has passed all the tests will interwork with other real open systems. (The SCTR proforma contains a paragraph for this purpose.)

The SCTR shall state clearly if non-conformance has been demonstrated in any of the test cases, or if any areas of concern have been observed. Such statements should be clear and unambiguous.

Section 1.8 of the SCTR shall record the agreement between the test laboratory and the client on the definition of what part(s) of the SUT are considered to be the IUT during testing, and on the Abstract Test Method(s) and ATS specification(s) to be used.

The SCS shall be attached to the SCTR.

The SCTR shall be made available to the client by test laboratory at the end of the conformance assessment process.

### 8.2.2 Client role

There are no requirements on the client during the production of the SCTR.

NOTE – The client should review the SCTR and, in the case of disagreement with the test laboratory over its content, should supply comments in section 1.9 of the SCTR.

### 8.2.3 Mutual role

The test laboratory and client shall ensure that information is provided in section 1.7 of the SCTR describing any restrictions that apply to the use by the client of the SCTR, or to its release by the test laboratory.

## 8.3 Protocol Conformance Test Report (PCTR)

### 8.3.1 Test laboratory role

At the client's request, the test laboratory shall provide an accompanying PCTR for each ATS which has been run during this conformance assessment process. The test laboratory need not use an PCTR proforma in the production of an PCTR (e.g. it may generate its PCTRs directly from an PCTR tool), but if it does use an PCTR proforma then that proforma shall conform to the template given in Annex B. In either case, the test laboratory shall produce each SCTR in conformance with the PCTR template given in Annex B.

Each PCTR shall record the conformance status of the IUT with respect to the base specification(s) which have been tested. In sections 3 and 5 of the PCTR, the test laboratory shall record the results of the static conformance review. In section 6, the test laboratory shall list all of the abstract test cases in the ATS reference column as specified in 7.3.1, together with the following information:

a) Which abstract test cases which were selected for inclusion in the PETS (see 7.3.1).

b) Which abstract test cases had corresponding executable test cases run to completion during the test campaign, including any Basic Interconnection Tests which were run.

NOTE 1 – Test cases which are selected but reported as being ''Not Run'' include those which produced a test case error or an abnormal test case termination, as well as those which were out of service.

c) The verdicts assigned to those test cases that were run to completion.

d) Observations (if any) made by the test laboratory during the test campaign.

The test laboratory may, optionally, include extra information (e.g. mappings from ATS to ETS, mapping to other PCTRs, conformance log references for test cases which led to a Fail or Inconclusive verdict).

The test laboratory shall ensure that the correct set of test cases has been performed for the IUT. If the MOT has selected a test case which is not appropriate for the IUT, then the test laboratory shall not document the result of that test case in the PCTR but shall indicate that the test was ‘‘Not Run’’ together with the reason why. If the MOT failed to select a test case which is appropriate for the IUT, then the test laboratory shall indicate in the PCTR that the test was selected but that it was ‘‘Not Run’’, together with the reason why.

NOTE 2 – The test laboratory should try to correct the error in either the ATS specification (by submitting a defect report) or in the MOT, as appropriate.

If no Fail verdicts are to be recorded in the PCTR, the test laboratory shall complete section 4 to indicate that ‘‘the test campaign did not reveal errors in the IUT’’. If, in addition, the ICS(s) for the IUT is consistent with the static conformance requirements, the test laboratory shall complete section 1 to indicate that ‘‘the IUT has not been shown by conformance assessment to be non-conforming to the referenced base specification(s)’’.

The relevant ICS(s) and IXIT(s), including, if appropriate, the profile RL and profile XRL, shall be attached to the PCTR. Only one copy of each ICS or IXIT needs to be included in a single collection of SCTR(s) and PCTR(s), even if it is referenced by more than one test report.

At the client’s request, the test laboratory shall also provide to the client any or all of the appropriate conformance logs, together with guidance on how to interpret them.

NOTE 3 – As a minimum, the conformance logs are required to be available on paper, but it is recommended that they are also available in a machine-readable format suitable for the client.

The test laboratory shall record in the PCTR the retention date for the conformance logs.

NOTE 4 – It is recommended that, if available, either the ordered list of actual test events which is specific to the test system, or a machine-readable version of the conformance log, is retained until the retention date.

#### 8.3.2 Client role

The client shall inform the test laboratory whether or not PCTR(s) and the associated conformance logs are to be provided.

NOTE – The client should review each PCTR and, in the case of disagreement with the test laboratory over its content, should supply comments in section 1.5 of the PCTR.

#### 8.3.3 Mutual role

The test laboratory and client shall ensure that information is provided in section 1.4 of the PCTR describing any restrictions that apply to the use by the client of the PCTR, or to its release by the test laboratory.

# 9 Compliance

## 9.1 Test laboratory role

**9.1.1** A test laboratory which claims to comply with this Recommendation shall:

a) for each SUT for which it carries out conformance assessment, comply with the requirements stated under the subclauses entitled ‘‘Test laboratory role’’ and ‘‘Mutual role’’ for

   1) the preparation for testing, as stated in clause 6;

   2) test operation, as stated in clause 7;

   3) test report production, as stated in clause 8 and Annexes A and B;

b) test each IUT by means of conformance testing specifications which comply with Recommendation .291, and if appropriate by a PTS which complies with Recommendation X.295, using MOT which comply with Recommendation X.293.

**9.1.2** In addition, if a test laboratory claims to provide a comprehensive conformance testing service for a specific base specification or combination of base specifications, then it shall comply with the requirements for a comprehensive conformance testing service stated in the relevant conformance testing specification(s) and in Recommendation X.291.

NOTES

1 There is no requirement in Recommendations X.290 to X.296 that a test laboratory has to offer a comprehensive conformance testing service for any specific base specification.

2 There is a requirement on test suite specifiers, in 11.6.2/X.291, that they are to state the minimum requirements which are to be met by test laboratories in order to claim a comprehensive conformance testing service for the relevant base specification(s).

3 If there is more than one ATS specification for the same base specification, then a test laboratory can be said to provide a comprehensive conformance testing service even if it meets the requirements for such a service in only one of them. This could arise for example if the ITU-T Recommendation and International Standard ATSs differ for the same test method and the same base specification.

**9.1.3** A test laboratory which makes a claim of conformance to the conformance testing specification(s) or PTS-Summary used for the conformance assessment, shall [in addition to satisfying the requirements stated in the conformance testing specification(s) and PTS-Summary if any] comply with the requirements stated under the subclauses entitled ‘‘Test laboratory role’’ and ‘‘Mutual role’’ for

a) test selection, as stated in 7.3;

b) test parameterization, as stated in 7.4;

c) the test campaign, as stated in 7.6.

## 9.2 Client role

A client which claims to comply with this Recommendation shall, for each SUT presented for conformance assessment, comply with the requirements stated under the subclauses entitled ‘‘Client role’’ and ‘‘Mutual role’’ throughout clauses 6, 7 and 8.

# Annex A

## System Conformance Test Report (SCTR) *template* [4)]

(This annex forms an integral part of this Recommendation)

### A.1 Introduction

This annex provides an SCTR template which shall be used either to create an SCTR proforma or to create the completed SCTR which documents the results of a conformance assessment process for a specific client.

The text in *underlined italics* is intended as guidance for the production of an SCTR proforma.

The text in *italics* but not underlined is intended as guidance for the production of an SCTR by the test laboratory.

The name of the test laboratory, the SCTR number, the page number and the total number of pages should appear on every page of the SCTR.

The SCS for an SUT/IUT may specify zero, one or several profiles for which conformance assessment is required. Section 1.5 of the SCTR template shall be stated to be not applicable in the SCTR proforma or completed SCTR if it does not relate to profile testing. Otherwise it shall contain the actual references relevant to a single profile. Thus, for profile testing, the conformance assessment process of each profile shall result in a separate SCTR.

The package of documents produced as a result of the conformance assessment process (i.e. SCTRs, PCTRs, SCS, ICSs, IXITs) shall include at least one copy of each relevant document but need not include more than one. Thus, "reference to attached document" in this proforma means "reference to a copy of the document included in the package of documents".

Section 2.n of the SCTR template shall be used to generate as many sections 2.n in the SCTR proforma and in the SCTR, as there are test suites used, in accordance with the PTS-Summary or as required by the definition of what is to be tested in the SCS.

### A.2 Conformance

An SCTR proforma conforms to the SCTR template given in this annex provided that:

a) no items are omitted from the template, although they may be translated into another natural language as well as or instead of the English language text given in the template;

b) the order of items is as specified in the template;

c) text in *underlined italics* is replaced by the required information (e.g. profile identification) or is used to generate the tailored proforma (e.g. generation of 2.n sections) which may affect the general presentation and pagination;

d) text in *italics* and/or a translation of it into another natural language is included;

An SCTR conforms to the SCTR template given in this annex provided that, in addition to the above,

e) text in italics (or its translation) is replaced or complemented by information relevant to the conformance assessment process.

### A.3 SCTR proforma

The SCTR shall use the format given in the following pages:

---

4) Copyright release for SCTR Proformas.
Users of this Recommendation may freely reproduce the SCTR template in this annex so that it can be used for its intended purpose and may further publish the completed SCTR.

**System Conformance Test Report for *SUT Name***

# 1. IDENTIFICATION SUMMARY

## 1.1 SYSTEM CONFORMANCE TEST REPORT

| | |
|---|---|
| SCTR Number: | *Reference number* |
| SCTR Date: | *Date* |
| Test Laboratory Manager: | *Name* |
| Signature: | *Signature* |

## 1.2 TEST LABORATORY

| | |
|---|---|
| Identification: | *Name, address, etc.* |

## 1.3 CLIENT

| | |
|---|---|
| Identification: | *Name, address, etc.* |

## 1.4 SUT

| | |
|---|---|
| Name: | *System name* |
| Version: | *System version* |
| Supplier: | *Name* |
| Period of Testing: | *Dates* |
| Date of Receipt of SUT: | *Date* |
| or | |
| Location of SUT for Testing: | *Location* |
| SCS Identifier: | *Reference to attached document* |

## 1.5 PROFILE

| | |
|---|---|
| Profile identification[5)]: | *Identification* |
| Profile version[5)]: | *Reference* |
| PTS-Summary reference[5)]: | *Reference* |
| PSTS reference[5)]: | *Reference* |
| Profile ICS[5)]: | *Reference to attached document(s)* |
| Profile IXIT[5)]: | *Reference to attached document(s)* |

[5)] Only needed if relevant.

## 1.6 NATURE OF CONFORMANCE TESTING

The purpose of Conformance Testing is to increase the probability that different implementations can interwork. However, the complexity of OSI protocols makes exhaustive testing impractical on both technical and economic grounds. Furthermore, there is no guarantee that an SUT which has passed all the relevant test cases conforms to a specification. Neither is there any guarantee that such an SUT will interwork with other real open systems. Rather, the passing of the test cases gives confidence that the SUT has the stated capabilities and that its behaviour conforms consistently in representative instances of communication.

## 1.7 LIMITS AND RESERVATIONS

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

The test results presented in this test report apply only to the particular SUT and component IUTs declared in sections 1.4 and 1.8 of this SCTR, for the functionality described in the referenced SCS and in the ICS(s) referenced in each PCTR, as presented for test in the period declared in section 1.4 and configured as declared in the relevant IXIT(s) referenced in each PCTR. This SCTR may not be reproduced except in full together with its SCS.

## 1.8 RECORD OF AGREEMENT

*A definition of what part(s) of the SUT were considered to be the IUT(s) during testing, and of the Abstract Test Method(s) and abstract test suite(s) that were used.*

| IUT definition reference | Component | ATS reference | ATM(s) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

*The above table gives guidance to the nature of the information which may appear in the record of agreement. Here the ‘‘IUT definition reference’’ means the full reference of the IUT to be tested by the referenced ATS. A ‘‘component’’ identifies the protocol(s) and/or information object(s) which are to be tested. The ‘‘ATM(s)’’ contains a list of Abstract Test Methods used by the ATSs and also indicates if MPyT test methods are used.*

## 1.9 COMMENTS

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

# 2. SYSTEM REPORT SUMMARY

*For each component (*i.e. *protocol or set of protocols and/or information objects) tested, a summary of the testing and conformance status of the implementation of that component is required, using clauses of the format shown below.*

## 2.n TESTING SUMMARY FOR *Component Name*

| | |
|---|---|
| Accreditation status: | *Reference* |
| Accreditation reference: | *Reference* |
| Implementation identifier: | *Name and version number* |
| IUT definition reference: | *Reference from section 1.8* |
| Protocol specification(s)[6]: | *Reference(s)* |
| Information object specification(s)[6]: | *Reference(s)* |
| ICS(s)[6]: | *Reference to attached document(s)* |
| IXIT(s)[6]: | *Reference to attached document(s)* |
| PCTR Number: | *Reference to attached document* |
| PCTR Date: | *Date of PCTR* |
| ATS specification(s)[7]: | *Reference(s)* |
| Abstract Test Method(s): | *Identification of method(s)* |
| Means of Testing identifier: | *Name and version number* |
| Conformance Status: | |
| Static Conformance errors?: | *Yes/No* |
| Dynamic Conformance errors?: | *Yes/No* |
| Test cases run: | *Number* |
| Passed: | *Number* |
| Failed: | *Number* |
| Inconclusive: | *Number* |

Observations (optional):

*If the SUT is not statically and dynamically conforming for this component, an additional summary may be given on aspects of non-conformance. Any difficulties encountered may be reported here.*

---

[6] In the case of a component consisting of more than a single protocol, it is possible to have more than one reference.

[7] In the case of common and specific parts, it is possible to have more than one reference.

# Annex B

## Protocol Conformance Test Report (PCTR) *template* [8)]

(This annex forms an integral part of this Recommendation)

### B.1 Introduction

This annex provides a PCTR template which shall be used to create either a PCTR proforma or a completed PCTR to document the results of conformance testing against a specific component (i.e. a base specification or combination of base specifications) using a particular ATS specification or test suite within a PSTS, for a specific client. A component may cover one or more protocols, possibly together with one or more information objects, provided that all are tested by the one test suite.

The text in *underlined italics* is intended as guidance for the production of a PCTR proforma.

The text in *italics* but not underlined is intended as guidance for the production of a PCTR by the test laboratory.

The name of the test laboratory, the PCTR number, the page number and the total number of pages should appear on every page of the PCTR.

The package of documents produced as a result of the conformance assessment process (i.e. SCTRs, PCTRs, SCS, ICSs, IXITs) shall include at least one copy of each relevant document but need not include more than one. Thus, "reference to attached document" in this proforma means "reference to a copy of the document included in the package of documents".

If an SUT is tested for support of multiple profiles, a PCTR may be wholly relevant to more than one profile, provided that the required test cases are identical, the SUT configuration is the same and the MOT is the same. In other cases, a subset of the results reported in one PCTR may be relevant to another PCTR, provided that the SUT configuration is the same and the MOT is the same, in which case the results shall be reported in each relevant PCTR even if the test cases have only been run once.

### B.2 Conformance

A PCTR proforma conforms to the PCTR template given in this annex provided that:

a) no items are omitted from the template, although they may be translated into another natural language as well as or instead of the English language text given in the template;

b) the order of items is as specified in the template;

c) text in *underlined italics* is replaced by the required information (i.e. profile RL identification);

d) text in *italics* and/or a translation of it into another natural language is included;

A PCTR conforms to the PCTR template given in this annex provided that, in addition to the above,

e) text in *italics* (or its translation) is replaced or complemented by information relevant to the conformance assessment process.

### B.3 PCTR proforma

The PCTR shall use the format given in the following pages:

---

8) Copyright release for PCTR Proformas.
Users of this Recommendation may freely reproduce the PCTR template in this annex so that it can be used for its intended purpose and may further publish the completed PCTR.

**Protocol Conformance Test Report for *Component Description***

# 1. IDENTIFICATION SUMMARY

## 1.1 PROTOCOL CONFORMANCE TEST REPORT

| | |
|---|---|
| PCTR Number: | *Reference number* |
| PCTR Date: | *Date* |
| Test laboratory: | *Identification* |
| Accreditation status | *Reference* |
| Accreditation reference | *Reference* |
| Technical Authority: | *Name* |
| Job Title: | *Name* |
| Signature: | *Signature* |
| Test Laboratory Manager: | *Name* |
| Signature: | *Signature* |

## 1.2 IUT

| | |
|---|---|
| Name: | *Implementation name* |
| Version: | *Implementation version* |
| Protocol specification(s)[9]: | *Reference(s)* |
| Information object specification(s)[9]: | *Reference(s)* |
| ICS(s)[9]: | *Reference to attached document(s)* |
| Profile RL[10]: | *Reference to attached document* |
| Profile Specific ICS[10]: | *Reference to attached document* |

## 1.3 TESTING ENVIRONMENT

| | |
|---|---|
| IXIT(s): | *Reference to attached document* |
| Profile XRL[10]: | *Reference to attached document* |
| Profile Specific IXIT[10]: | *Reference to attached document* |
| ATS specification[11] : | *Reference(s)* |
| Abstract Test Method(s): | *Identification of SPyT test method(s) ‘‘Multi-Party’’* |
| Means of Testing identification: | *Identification* |
| Period of testing: | *Dates* |
| Conformance Log reference(s): | *Information required to obtain conformance logs* |
| Retention Date for Log reference(s): | *Date* |

---

[9] In the case of a component consisting of more than a single protocol, it is possible to have more than one reference.

[10] Only needed if relevant.

[11] In the case of common and specific parts, it is possible to have more than one reference.

## 1.4 LIMITS AND RESERVATIONS

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

The order of test cases listed in section 6 of this PCTR corresponds to the ordering of test cases defined in the ATS referenced in section 1.3. This does not indicate that the test cases were executed in this order.

The test results presented in this test report apply only to the particular IUT declared in section 1.2 of this PCTR, for functionality described in the relevant ICS(s) attached to this PCTR, as presented for test in the period declared in section 1.3 and configured as declared in the relevant IXIT(s) attached to this PCTR. This PCTR shall not be reproduced except in full together with its attached ICS(s) and IXIT(s).

## 1.5 COMMENTS

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

# 2. IUT CONFORMANCE STATUS

This IUT has/has not been shown by conformance assessment to be non-conforming to the referenced base specification(s).

*Strike the appropriate words in this sentence; if the ICS(s) for this IUT is consistent with the static conformance requirements (as specified in section 3 of this report) and there are no "Fail" verdicts to be recorded (in section 6) strike the word "has/", otherwise strike the words "/has not".*

# 3. STATIC CONFORMANCE SUMMARY

The ICS(s) for this IUT is/is not consistent with the static conformance requirements in the referenced base specification(s).

*Strike the appropriate words in this sentence.*

# 4. DYNAMIC CONFORMANCE SUMMARY

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

*Strike the appropriate words in this sentence; if there are no "Fail" verdicts to be recorded in section 6 of this report, strike the word "did/", otherwise strike the words "/did not".*

*In addition, a summary of the results of groups of test cases may be given. The detailed results of testing are provided in the table of section 6. This summary may, for example, give totals for the number of passes, fails and inconclusives in each test group, and also allow the test laboratory to make observations on those results, such as "All the test cases concerned with segmented data transfer failed."*

# 5. STATIC CONFORMANCE REVIEW REPORT

*If section 3 indicates non-conformance, this section itemises the mismatches between the ICS(s) and the static conformance requirements of the referenced base specification(s).*

# 6. TEST CAMPAIGN REPORT

*This section shall use the following table which indicates both the test case selection that was performed by the test laboratory, and the results of testing. The list of abstract tests cases shall appear in this table in the same order as defined in the ATS specification and if relevant the PSTS specification (see 7.3.1). Notes on the information that the test laboratory shall complete in the columns are provided below, and referenced as n.*

*The table below indicates the minimum information which is required, additional columns may be added for attaching other information which may be provided, e.g. mappings from ATS to ETS or conformance log reference for test cases that led to Fail or Inconclusive verdicts.*

| ATS Reference | Selected? | Run? | Verdict | Observations |
|---|---|---|---|---|
| Reference<br>a) | Yes/No<br>b) | *Yes/No*<br>c) | P/F/I<br>d) | Any<br>e) |

*a) Reference to the abstract test case from the ATS specification or PSTS specification. This should be the same as the test purpose identifier in the TSS&TP. If not, a mapping between abstract test case references and test purpose identifiers shall be provided.*

*b) Indicate whether the test case was selected for execution against the IUT identified in section 1.2 according to the analysis of the information in the ICS(s) and IXIT(s) for the IUT. If the test case is deselected on the basis of the IXIT(s) then the test laboratory shall indicate why, by use of the observation column, by reference to the relevant IXIT(s) clause. The test laboratory may also provide clarification regarding which ICS entries led to the test case deselection, whether the deselection is as a result of evaluating the selection expression or directly as a result of ICS entries. If the test case is replaced, or deleted, on the basis of the PSTS, then this shall be indicated by an entry of "N/A" or "–". The test laboratory may provide further clarification of such replacements and deletions in the observations column.*

*c) If the test was selected, indicate whether or not the test was run to completion. If the status of the test was "Not Run", indicate why by use of the observation column (as defined in 7.6.2.4).*

*d) Enter the verdict as assigned during the test campaign for each test case run.*

*e) Enter an observation or a reference to any relevant observations made in section 7 of this PCTR.*

## 7. OBSERVATIONS

*Additional information relevant to the technical content of the PCTR may be given here.*

# Appendix I

## Skeleton IXIT *template* [12)]

(This appendix does not form an integral part of this Recommendation)

### I.1 Introduction

This appendix provides a skeleton structure for an IXIT proforma, suitable for use in the production of a Protocol IXIT proforma, information object IXIT proforma or profile specific IXIT proforma. The test laboratory should use this appendix to produce a comprehensive IXIT proforma of the same structure related to a specific ATS or PSTS and the corresponding MOT.

NOTE – This skeleton IXIT proforma is not oriented to any specific protocols, profile test methods or MOT and therefore should be modified and expanded as required by individual circumstances.

Text in *underlined italics* is guidance for the test laboratory to be replaced by the relevant information specific to the conformance assessment process when generating each IXIT proforma.

Text in *italics* is guidance for the client and should be retained in each IXIT proforma.

As the IXIT is normally used in conjunction with the corresponding ICS, it should not unnecessarily duplicate information provided by the ICS, other than that required to identify the client, the SUT and the base specification(s) and profiles(s) if any to be tested. Cross references should be provided in the IXIT to sections of the ICS wherever appropriate.

Where the client and the test laboratory agree that large amounts of information are necessary to enable testing to be performed, the IXIT should reference the appropriate documentation, rather than reproducing it.

The IXIT information relates mainly to the protocol(s) and information object(s), if any, to be tested. However, additional information relating to the ancillary layers (both higher and lower) involved in testing the IUT will also be required. The scope of this ancillary information will be dependent on the protocol(s) and information object(s) to be tested, the test method(s) and the MOT, but may include protocol and addressing information for each ancillary layer in the SUT [see 6. of IXIT proforma ("Ancillary protocols")].

Although the IXIT is intended primarily to provide information about the testing environment of the IUT to the test laboratory, it is also useful to incorporate into the IXIT that information (or references to it) which the client requires in order to prepare the SUT. The test laboratory incorporates this information into the IXIT proforma that is supplied to the client for completion. Examples include Lower Tester information (e.g addresses, timer values and parameter values) and the configuration of the ancillary layers to be used for testing.

### I.2 IXIT proforma

The IXIT proforma should use the format given in the following pages.

---

12) Copyright release for IXIT proformas
Users of this Recommendation may freely reproduce the IXI template in this appendix so that it can be used for its intended purpose and may further publish the completed IXIT.

## IXIT Proforma for ATS *or PSTS Name*

## 1. IDENTIFICATION SUMMARY

*This section is completed by the test laboratory.*

| | |
|---|---|
| IXIT Number: | *Reference number* |
| Test Laboratory Name: | *Name* |
| Date of Issue: | *Date* |
| Issued to: | *Name of client* |

*The test laboratory may include client or contract references in the identification summary.*

## 2. ABSTRACT TEST SUITE SUMMARY

*This section is completed by the Test Laboratory.*

| | |
|---|---|
| Protocol specification(s): | *Protocol(s) to be tested* |
| Information object specification(s): | *Information object(s) to be tested, if any* |
| ATS specification: | *ATS or PSTS reference* |
| Abstract Test Method(s): | *Abstract Test Method(s) used in the ATS or PSTS* |

## 3. TEST LABORATORY

*This section is completed by the Test Laboratory.*

| | |
|---|---|
| Test Laboratory Identification: | *Name and addressing details* |
| Accreditation status of the test service: | *Accreditation status* |
| Accreditation reference: | *Accreditation reference* |
| Test Laboratory Manager: | *Name* |
| Test Laboratory contact: | *Name* |
| Means of Testing: | *Identification of MOT, including version number* |

Instructions for Completion:

*The test laboratory should include any special instructions necessary for the completion and return of the proforma by the client.*

## 4. CLIENT

*This section is completed by the client and contains information to the identify the client. Typically, this should include:*

| | |
|---|---|
| Client Identification: | *Name and addressing details* |
| Client Test Manager: | *Name* |
| Client contact: | *Name* |

Test Facilities Required:

*The client should record the particular facilities required for testing, if a range of facilities is provided by the test laboratory.*

## 5. SUT

*This section is completed by the client.*

| | |
|---|---|
| Name: | *System name* |
| Version: | *System version* |
| SCS Reference: | *Reference* |
| Machine Configuration: | *Machine on which the SUT is mounted* |
| Operating System Identification: | *Operating system on which IUT is mounted* |
| Upper Tester Identification: | *Identification, if any* |
| Upper Tester Validation Date: | *Date, if appropriate* |
| IUT Identification: | *Implementation name* |
| ICS(s) | *Reference(s) to ICS(s) for the IUT* |

Limitations of the SUT:

*The client may provide information explaining if any of the abstract test cases cannot be executed, e.g. non-realization of ASPs if the Remote test method is used.*

Environmental Conditions:

*The test laboratory may specify the normal environmental conditions applying to the laboratory to be used for testing (e.g. temperature, humidity). The client should specify any tighter environmental conditions that may be necessary for the correct operation of the SUT.*

## 6. ANCILLARY PROTOCOLS

*This section is completed by the client in conjunction with the test laboratory.*

*In the following table, the client identifies relevant information concerning each ancillary protocol of the SUT:*

| Protocol Name | Version No. | PICS Ref. (opt.) | PIXIT Ref. (opt.) | PCTR Ref. (opt.) |
|---|---|---|---|---|
| | | | | |
| | | | | |

*One clause is required for each ancillary protocol included in the SUT other than the IUT itself. The information required is dependent on the MOT and the SUT, and covers all the addressing, parameter values, timer values and facilities (relevant to ITU-T Recommendations) as defined by the PICS for each protocol.*

## 7. PROTOCOL INFORMATION (for *Protocol Name*)

*This section is completed by the test laboratory and client in consultation. This section applies only to Protocol IXIT proformas.*

## 7.1 PROTOCOL IDENTIFICATION

Specification reference: *Reference including edition*

Protocol version: *Protocol version number*

PICS reference: *Reference*

## 7.2 IUT INFORMATION

*This subsection should include such items as addresses, parameter values and timer values required to test the IUT. It should be a refinement of the information provided in the PICS for the relevant protocol, but not conflict with it. Furthermore, it should include test suite parameters where they are identified in the test specification.*

### 7.2.1 Addresses

*This subsection should identify the Service Access Point addresses to be used:*

*a) by the Lower Tester(s) to access the IUT (provided by the client);*

*b) by the SUT to access the Lower Tester(s) (provided by the test laboratory).*

### 7.2.2 Parameter Values

| Parameter Name | Parameter Type | PICS Clause | Parameter Range | Parameter Value |
|---|---|---|---|---|
| | | | | |
| | | | | |

*The client provides the parameter range and the exact parameter value to be used is agreed between the client and the test laboratory.*

### 7.2.3 Timer Values

| Timer Name Type | PICS Clause | Timer Range | Timer Value |
|---|---|---|---|
| | | | |

### 7.2.4 Procedural Information

*This subsection should identify requirements for testing, placed by the ATS or PSTS specification, which may not be realizable by the SUT and which may result in abstract test cases which cannot be executed; for example, if the Remote test method is used, non-realization of the control of sending a particular PDU by the IUT, i.e. as required by the TTCN Implicit Send statement.*

# 8. INFORMATION OBJECT INFORMATION (for *Information Object Name*)

*This section applies only to information object IXIT proformas.*

## 8.1 INFORMATION OBJECT IDENTIFICATION

Object identifier: *Object identifier*

Specification reference: *Reference including edition*

ICS reference: *Reference*

## 8.2 IUT INFORMATION

*This subsection should include such items as parameter values which are related to the information object and which are required to test the IUT. It should be a refinement of the information provided in the ICS for the relevant information object, but not conflict with it. Furthermore, it should include test suite parameters where they are identified in the test specification.*

### 8.2.1 Parameter Values

| Parameter Name | Parameter Type | ICS Clause | Parameter Range | Parameter Value |
|---|---|---|---|---|
| | | | | |

*The client provides the parameter range and the exact parameter value to be used is agreed between the client and the test laboratory.*

### 8.2.2 Procedural Information

*This subsection should identify requirements for testing, placed by the ATS or PSTS specification, which may not be realizable by the SUT and which may result in abstract test cases which cannot be executed.*

# 9. PROFILE SPECIFIC INFORMATION (for *Profile Name*)

*This section applies only to profile specific IXIT proformas.*

## 9.1 PROFILE IDENTIFICATION

Profile identifier: *Identifier from ISO/IEC TR 10000-2 taxonomy*

Specification reference: *Reference including edition*

Profile specific ICS reference: Reference

## 9.2 CONFIGURATION INFORMATION

*This subsection should include information on how the SUT is to be configured for testing its conformance to the identified profile. This should be specified in sufficient detail to allow the test campaign(s) to be reproduced with the same configuration of the SUT at a later date, if this should prove to be necessary.*