



TECHNICAL SPECIFICATION



**Power systems management and associated information exchange – Data and communication security –
Part 100-4: Cybersecurity conformance testing for IEC 62351-4**

INTERNATIONAL
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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms, definitions, and abbreviated terms	10
3.1 Terms and definitions.....	10
3.2 Abbreviated terms.....	11
4 Application structure and information flow.....	11
4.1 Overview	11
4.2 Application entity structure.....	12
4.3 Relationship to test structure	13
5 General	14
5.1 General guidelines.....	14
5.2 Test methodology	14
5.2.1 General	14
5.2.2 Normal procedure tests and resiliency tests.....	14
5.2.3 SubClass descriptions	14
5.3 Conformance testing requirements.....	15
5.3.1 Testing within the context of an application.....	15
5.3.2 Requirements for the device under test	15
5.3.3 Requirements for the test facility	15
5.3.4 Test Validation	16
5.4 PICS.....	16
5.5 PIXIT	17
5.6 Tests cases	18
6 E2E conformity testing in an OSI environment.....	22
6.1 Conformance tables for E2E OSI-security profile	22
6.2 E2E Test Procedures for OSI environment.....	25
6.2.1 Association Management.....	25
6.2.2 Clear Data Transfer	29
6.2.3 Encrypted Data Transfer.....	31
6.2.4 Rekey.....	34
7 E2E conformity testing in the XMPP environment	38
7.1 Conformance tables for E2E-XMPP security profile.....	38
7.2 E2E Test Procedures for XMPP environment	41
7.2.1 Association Management.....	41
7.2.2 Clear Data Transfer	44
7.2.3 Encrypted Data Transfer.....	45
7.2.4 Rekey.....	46
8 E2E Resiliency test procedures	49
8.1 General.....	49
8.2 Association Management Resiliency Testing.....	50
8.3 Clear Data Transfer Resiliency	59
8.4 Encrypted Data Transfer Resiliency	64
9 E2E security subclass (SecPDU).....	68
9.1 E2E Handshake request subclass.....	68

9.2	E2E handshake accept subclass	71
9.3	E2E Application reject subclass	74
9.4	E2E Handshake reject subclass	76
9.5	E2E Handshake security abort subclass	78
9.6	E2E Data transfer security abort subclass	80
9.7	E2E Abort by protected protocol subclass	82
9.8	E2E Clear data transfer subclass	84
9.9	E2E Encrypted data transfer subclass	88
9.10	E2E Association release request subclass	92
9.11	E2E Association release response subclass	94
10	OSI subclass (EnvPDU).....	96
10.1	OSI association request subclass	96
10.2	OSI association response subclass.....	98
10.3	OSI abort subclass	100
10.4	OSI clear data transfer subclass	103
10.5	OSI encrypted data transfer subclass.....	103
10.6	OSI release request subclass	104
10.7	OSI release response subclass	104
11	XMPP subclass (EnvPDU).....	105
11.1	XMPP IQ stanza subclass	105
11.2	XMPP message stanza subclass.....	108
11.3	XMPP error subclass	109
	Figure 1 – Application entity structure and information flow.....	12
	Figure 2 – Relationships between APDUs	12
	Figure 3 – Structure for test specifications	13
	Table 1 – PIXIT for Base Profile.....	17
	Table 2 – PIXIT for Secure Communication.....	18
	Table 3 – IEC 62351-4:2018/AMD1:2020 E2E Compliancy Testing (IEC 61850-8-1 and ICCP)	19
	Table 4 – IEC 62351-4:2018/AMD1:2020 E2E Compliancy Testing (IEC 61850-8-2)	21
	Table 5 – Base Profile – E2E Security	23
	Table 6 – Protocol Handshake – E2E Security	23
	Table 7 – IEC 61850 Application Association – E2E Security	23
	Table 8 – OSI EnvPDU Supported – E2E Security	23
	Table 9 – OSI EnvPDU Subclass Supported – E2E Security	23
	Table 10 – E2E SecPDU Subclass Supported.....	24
	Table 11 – OSI Mode of encryption – E2E Security	24
	Table 12 – Cryptographic algorithms – E2E Security.....	24
	Table 13 – ASN.1 Objects – E2E Security.....	25
	Table 14 – Verification of Client handshake request procedure in OSI environment	26
	Table 15 – Verification of Server handshake request procedure in OSI environment.....	27
	Table 16 – Handshake request resiliency procedure in OSI environment – Client	28
	Table 17 – Handshake request resiliency procedure in OSI environment – Server	29

Table 18 – Verification of requirements for OSI environment security – Clear Data transfer	30
Table 19 – Clear Data Transfer resiliency procedure in OSI environment – Client	30
Table 20 – Clear Data Transfer resiliency procedure in OSI environment – Server	31
Table 21 – Verification of requirements for OSI environment security – Encrypted data transfer	32
Table 22 – Resiliency testing for client – Encrypted data transfer	33
Table 23 – Resiliency testing for server – Encrypted data transfer	34
Table 24 – Verification of requirements for OSI environment security – Rekey initiated by the client	35
Table 25 – Verification of requirements for OSI environment security – Rekey initiated by the Server	36
Table 26 – Base Profile – E2E XMPP Security	38
Table 27 – Protocol Handshake – E2E XMPP Security	38
Table 28 – IEC 61850 Application Association – E2E XMPP Security	38
Table 29 – EnvPDU Parameters– E2E XMPP Security	39
Table 30 – EnvPDU Supported– E2E XMPP Security	39
Table 31 – SecPDU Subclasses– E2E XMPP Security	39
Table 32 – Encryption – E2E XMPP Security	40
Table 33 – Cryptographic algorithms – E2E XMPP Security	40
Table 34 – XMPP – E2E XMPP Security	40
Table 35 – XMPP– E2E XMPP Security	41
Table 36 – XMPP T-profile – E2E XMPP Security	41
Table 37 – Verification of client handshake request procedure in XMPP environment	42
Table 38 – Verification of server handshake request procedure in XMPP environment	43
Table 39 – Handshake request resiliency procedure in XMPP environment – Client	43
Table 40 – Handshake request resiliency procedure in XMPP environment – Server	44
Table 41 – Verification of requirements for XMPP environment security – Clear Data transfer	44
Table 42 – Clear Data Transfer resiliency procedure in XMPP environment – Server	45
Table 43 – Clear Data Transfer resiliency procedure in XMPP environment – Client	45
Table 44 – Verification of requirements for XMPP environment security – Encrypted data transfer	45
Table 45 – Resiliency testing for client – Encrypted data transfer	46
Table 46 – Resiliency testing for server – Encrypted data transfer	46
Table 47 – Verification of requirements for XMPP environment security – Rekey initiated by the client	47
Table 48 – Verification of requirements for XMPP environment security – Rekey initiated by the server	48
Table 49 – Handshake request resiliency procedure – Client	50
Table 50 – Handshake request resiliency procedure – Server	55
Table 51 – Clear Data Transfer resiliency – Server	59
Table 52 – Clear Data Transfer resiliency – Client	61
Table 53 – Resiliency testing for client – Encrypted data transfer	64
Table 54 – Resiliency testing for server – Encrypted data transfer	66
Table 55 – E2E handshake request subclass	69

Table 56 – E2E handshake accept subclass.....	71
Table 57 – E2E Application reject subclass.....	75
Table 58 – Server reject of association due to security issues	77
Table 59 – Test of client submitted handshake security abort	79
Table 60 – Client or server emitted data transfer security abort	81
Table 61 – Client or server emitted abort by protected protocol.....	83
Table 62 – Client initiated clear data transfer.....	85
Table 63 – Server initiated clear data transfer.....	87
Table 64 – Client initiated encrypted data transfer	89
Table 65 – Server initiated encrypted data transfer	91
Table 66 – Client or server issued association release request.....	93
Table 67 – Client or server association release response	95
Table 68 – OSI association request subclass.....	97
Table 69 – OSI association response subclass	99
Table 70 – Client OSI abort subclass	101
Table 71 – Server OSI abort subclass.....	102
Table 72 – Client or server OSI environment clear data transfer	103
Table 73 – Client or server OSI environment encrypted data transfer.....	103
Table 74 – OSI release request subclass.....	104
Table 75 – OSI release response subclass	105
Table 76 – Client XMPP iq stanza subclass	106
Table 77 – Server XMPP IQ stanza subclass	107
Table 78 – Client XMPP message stanza subclass	108
Table 79 – Server XMPP message stanza subclass.....	109

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION
EXCHANGE – DATA AND COMMUNICATION SECURITY –**

Part 100-4: Cybersecurity conformance testing for 62351-4

FOREWORD

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IEC TS 62351-100-4 has been prepared by IEC technical committee 57: Power systems management and associated information exchange. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
57/2505/DTS	57/2564/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

A list of all parts in the IEC 62351 series, published under the general title *Power systems management and associated information exchange – Data and communications security*, can be found on the IEC website.

In this document the following print types are used:

- Abstract Syntax Notation One (ASN.1) and W3C XML Schema Definition (W3C XSD) notions are presented in **Courier New** typeface; and
- when ASN.1 types and values are referenced in normal text, they are differentiated from normal text by presenting them in **Courier New** typeface.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

The quality system of a device producer forms the basis of reliable testing in development and production activities. Many internal tests during the development of a device result in a unit level test performed at least by the provider and – if required by applicable standards – by an independent test authority. In the context of this document, the term type test is restricted to the functional behavior of the device.

To validate the results of some tests, internal IED information should be made available (see 5.3.4). These requirements are beyond those specified in IEC 62351-4 and therefore the manufacturer/vendor shall describe in Table 2 how the IED can expose the required information.

Conformance testing does not replace project-specific system-related tests such as the POC (Proof Of Concept) FAT (Factory acceptance Test) and SAT (Site Acceptance Test). The POC, FAT and SAT are based on specific customer requirements for a dedicated substation automation system and are done by the system integrator and normally witnessed by the customer. These tests increase the confidence level that all potential problems in the system have been identified and solved. These tests establish that the delivered substation automation system is performing as specified. The conformance testing reduces the risks of failure during the POC, FAT and SAT.

The purpose of this part of IEC 62351 is to cover all possible situations taking into consideration the normal operating test cases and the resiliency test cases to demonstrate the capability of the DUT to operate with other devices in the specified way according to IEC 62351-4:2018/AMD1:2020, and also according to the PID (Protocol Implementation Document). Testing of Application layer protocol (61860-8-1, 61850-8-2 or ICCP) features or performances is out of scope.

Through this part of IEC 62351, a test facility can prove that the DUT communication subsystem (or a part of it) conforms to IEC 62351-4:2018/AMD1:2020.

The test cases described in this specification do not guarantee full cybersecurity conformance testing. It is to be complemented with other test suites.

POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION EXCHANGE – DATA AND COMMUNICATION SECURITY –

Part 100-4: Cybersecurity conformance testing for 62351-4

1 Scope

This part of IEC 62351, which is a technical specification, describes test procedures for interoperability conformance testing of data and communication security for power system automation and protection systems which implement MMS, IEC 61850-8-1 (MMS), IEC 61850-8-2 (XMPP) or any other protocol implementing IEC 62351-4:2018/AMD1:2020. The tests described in this document cover only E2E security testing and do not evaluate A-security¹ profile implementation. Thus, citing conformance to this document does not imply that any particular security level has been achieved by the corresponding product, or by the system in which it is used.

The goal of this document is to enable interoperability by providing a standard method of testing protocol implementations, but it does not guarantee the full interoperability of devices. It is expected that using this document during testing will minimize the risk of non-interoperability. Additional testing and assurance measures will be required to verify that a particular implementation of IEC 62351-4:2018/AMD1:2020 has correctly implemented all the security functions and that they can be assured to be present in the delivered products. This topic is covered in other IEC standards, for example IEC 62443.

The scope of this document is to specify available common procedures and definitions for conformance and/or interoperability testing of IEC 62351-4:2018/AMD1:2020.

This document deals mainly with cyber security conformance testing; therefore, other requirements, such as safety or EMC are not covered. These requirements are covered by other standards (if applicable) and the proof of compliance for these topics is done according to these standards.

T-profile testing is to be performed prior to E2E security profile testing. T-profile testing is described in IEC 62351-100-3 in the context of IEC 61850-8-1. T-profile testing for IEC 61850-8-2 is to be described in the corresponding IEC 61850-8-2 test specification.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62351-4:2018, *Power systems management and associated information exchange – Data and communications security – Part 4: Profiles including MMS and derivatives*
IEC 62351-4:2018/AMD1:2020

IEC 62351-3:2023, *Power systems management and associated information exchange – Data and communications security – Part 3: Communication network and system security – Profiles including TCP/IP*

¹ A-profile is specified in IEC 62351-4:2020 for backward compatibility with IEC 62351-4:2007.

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IEC 62351-6, *Power systems management and associated information exchange – Data and communications security – Part 6: Security for IEC 61850*