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STN	**Riadenie elektrických výkonových sústav a pridružená výmena informácií Bezpečnosť údajov a komunikácií Časť 7: Objektové modely údajov pre riadenie siete a systémov (NSM)**	**STN EN IEC 62351-7** 33 4622

Power systems management and associated information exchange - Data and communications security - Part 7: Network and System Management (NSM) data object models

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/26

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Power systems management and associated information exchange - Data and communications security - Part 7: Network and System Management (NSM) data object models (IEC 62351-7:2025)

Gestion des systèmes de puissance et échanges d'informations associés - Sécurité des communications et des données - Partie 7: Modèles d'objets de données de gestion de réseaux et de systèmes (NSM)
(IEC 62351-7:2025)

Datenmodelle, Schnittstellen und Informationsaustausch für Planung und Betrieb von Energieversorgungsunternehmen - Daten- und Kommunikationssicherheit - Teil 7: Datenobjektmodelle für Netzwerk- und Systemmanagement (NSM)
(IEC 62351-7:2025)

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 57/2798/FDIS, future edition 2 of IEC 62351-7, prepared by TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62351-7:2026.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2027-01-31
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2029-01-31

This document supersedes EN 62351-7:2017 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a standardization request addressed to CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62351-7:2025 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 61850-7-2	NOTE	Approved as EN 61850-7-2
IEC 61850-7-4	NOTE	Approved as EN 61850-7-4
IEC 61850-8-1	NOTE	Approved as EN 61850-8-1
IEC 61850-9-2	NOTE	Approved as EN 61850-9-2

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC/TS 62351-1	-	Power systems management and associated information exchange - Data and communications security - Part 1: Communication network and system security - Introduction to security issues	-	-
IEC/TS 62351-2	-	Power systems management and associated information exchange - Data and communications security - Part 2: Glossary of terms	-	-
IEC 62351-3	-	Power systems management and associated information exchange - Data and communications security - Part 3: Communication network and system security - Profiles including TCP/IP	EN IEC 62351-3	-
IEC 62351-4	-	Power systems management and associated information exchange - Data and communications security - Part 4: Profiles including MMS and derivatives	EN IEC 62351-4	-
IEC 62351-5	2023	Power systems management and associated information exchange - Data and communications security - Part 5: Security for IEC 60870-5 and derivatives	EN IEC 62351-5	2023
IEC 62351-8	-	Power systems management and associated information exchange - Data and communications security - Part 8: Role-based access control for power system management	EN IEC 62351-8	-
IEC 62351-9	-	Power systems management and associated information exchange - Data and communications security - Part 9: Cyber security key management for power system equipment	EN IEC 62351-9	-
IEEE 754	2008	IEEE Standard for Binary Floating-Point Arithmetic	-	-
IETF RFC 2578	-	Structure of Management Information Version 2 (SMIv2), April 1999, http://tools.ietf.org/html/rfc2578	-	-

EN IEC 62351-7:2026 (E)

Publication	Year	Title	EN/HD	Year
IETF RFC 3414	-	User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3), December 2002, http://tools.ietf.org/rfc/rfc3414	-	-
IETF RFC 3826	-	The Advanced Encryption Standard (AES) Cipher Algorithm in the SNMP User-based Security Model, June 2004, http://www.rfc-editor.org/rfc/rfc3826	-	-
IETF RFC 4022	-	Management Information Base for the Transmission Control Protocol (TCP), March 2005, http://tools.ietf.org/html/rfc4022	-	-
IETF RFC 4113	-	Management Information Base for the User-Datagram Protocol (UDP), June 2005, http://tools.ietf.org/html/rfc4113	-	-
IETF RFC 4292	-	IP Forwarding Table MIB, April 2006, http://www.rfc-editor.org/rfc/rfc4292	-	-
IETF RFC 4293	-	Management Information Base for the Internet Protocol (IP), April 2006, http://tools.ietf.org/rfc/rfc4293	-	-
IETF RFC 4898	-	TCP Extended Statistics MIB, May 2007, http://tools.ietf.org/rfc/rfc4898	-	-
IETF RFC 5132	-	IP Multicast MIB, December 2007, http://tools.ietf.org/rfc/rfc5132	-	-
IETF RFC 5905	-	Network Time Protocol Version_4: Protocol and Algorithms Specification	-	-
IETF RFC 5590	-	Transport Subsystem for the Simple Network Management Protocol (SNMP), June 2009, http://tools.ietf.org/rfc/rfc5590	-	-
IETF RFC 5591	-	Transport Security Model for the Simple Network Management Protocol (SNMP), June 2009, http://tools.ietf.org/rfc/rfc5591	-	-
IETF RFC 5592	-	Secure Shell Transport Model for the Simple Network Management Protocol (SNMP), June 2009, http://www.rfc-editor.org/rfc/rfc5592	-	-
IETF RFC 5953	-	Transport Layer Security (TLS) Transport Model for the Simple Network Management Protocol (SNMP), August 2010, http://www.rfc-editor.org/rfc/rfc5953	-	-
IETF RFC 6347	-	Datagram Transport Layer Security Version 1.2, January 2012, http://tools.ietf.org/rfc/rfc6347	-	-
IETF RFC 6353	-	Transport Layer Security (TLS) Transport Model for the Simple Network Management Protocol (SNMP), July 2011, http://tools.ietf.org/rfc/rfc6353	-	-
IETF RFC 7860	-	HMAC-SHA-2, Authentication Protocols in User-Based Security Model (USM) for SNMPv3, April 2016, http://tools.ietf.org/rfc/rfc7860	-	-
IETF RFC 8915	-	Protocol Security for the Network Time Protocol, September 2020, http://tools.ietf.org/rfc/rfc8915	-	-

IEC 62351-7

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INTERNATIONAL STANDARD

Power systems management and associated information exchange - Data and communications security -
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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Power systems management and associated information exchange - Data and communications security - Part 7: Network and System Management (NSM) data object models

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 62351-7 has been prepared by IEC technical committee 57: Power systems management and associated information exchange. It is an International Standard.

This edition of IEC 62351-7 cancels and replaces IEC 62351-7 published in 2017. This new edition constitutes a technical revision and includes the following significant technical changes with respect to IEC 62351-7:

a) Reviewed and enriched the NSM object data model;
b) UML model adopted for NSM objects description;
c) SNMP protocol MIBs translation included as Code Components.

The text of this International Standard is based on the following documents:

Draft	Report on voting
57/2798/FDIS	57/2829/RVD

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 International Standard is English.

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.

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

This IEC standard includes Code Components i.e components that are intended to be directly processed by a computer. Such content is any text found between the markers <CODE BEGINS> and <CODE ENDS>, or otherwise is clearly labeled in this standard as a Code Component.

The purchase of this IEC standard carries a copyright license for the purchaser to sell software containing Code Components from this standard directly to end users and to end users via distributors, subject to IEC software licensing conditions, which can be found at: http://www.iec.ch/CCv1.

The Code Components included in this IEC standard are also available as electronic machine readable file at: http://www.iec.ch/TC57/supportdocuments.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

1 Scope

This part of IEC 62351 defines network and system management (NSM) data object models that are specific to power system operations. These NSM data objects will be used to monitor the health of networks and systems, to detect possible security intrusions, and to manage the performance and reliability of the information infrastructure. The goal is to define a set of abstract objects that will allow the remote monitoring of the health and condition of IEDs (Intelligent Electronic Devices), RTUs (Remote Terminal Units), DERs (Distributed Energy Resources) systems and other systems that are important to power system operations.

Power systems operations are increasingly reliant on information infrastructures, including communication networks, IEDs, and self-defining communication protocols. Therefore, management of the information infrastructure has become crucial to providing the necessary high levels of security and reliability in power system operations.

The telecommunication infrastructure that is in use for the transport of telecontrol and automation protocols is already subject to health and condition monitoring control, using the concepts developed in the IETF Simple Network Management Protocol (SNMP) standards for network management. However, power system specific devices (like teleprotection, telecontrol, substation automation, synchrophasors, inverters and protections) need instead a specific solution for monitoring their health.

The NSM objects provide monitoring data for IEC protocols used for power systems (IEC 61850, IEC 60870-5-104) and device specific environmental and security status. As a derivative of IEC 60870-5-104, IEEE 1815 DNP3 is also included in the list of monitored protocols. The NSM data objects use the naming conventions developed for IEC 61850, expanded to address NSM issues. For the sake of generality these data objects, and the data types of which they are comprised, are defined as abstract models of data objects.

In addition to the abstract model, in order to allow the integration of the monitoring of power system devices within the NSM environment in this part of IEC 62351, a mapping of objects to the SNMP protocol of Management Information Base (MIBs) is provided.

The objects that are already covered by existing MIBs are not defined here but are expected to be compliant with existing MIB standards. For example protocols including EST, SCEP, RADIUS, LDAP, GDOI are not in scope.

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 TS 62351-1, *Power systems management and associated information exchange – Data and communications security – Part 1: Communication network and system security – Introduction to security issues*

IEC TS 62351-2, *Power systems management and associated information exchange – Data and communications security – Part 2: Glossary of terms*

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

IEC 62351-4, *Power systems management and associated information exchange – Data and communications security – Part 4: Profiles including MMS*[1]

IEC 62351-5:2023, *Power systems management and associated information exchange – Data and communications security – Part 5: Security for IEC 60870-5 and derivatives*

IEC 62351-8, *Power systems management and associated information exchange – Data and communications security – Part 8: Role-based access control*

IEC 62351-9, *Power systems management and associated information exchange – Data and communications security – Part 9: Cyber security key management for power system equipment*

IEEE 754:2008, *IEEE Standard for Floating-Point Arithmetic*

IETF RFC 2578, *Structure of Management Information Version 2 (SMIv2),* April 1999, http://tools.ietf.org/html/rfc2578

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IETF RFC 4113, *Management Information Base for the User Datagram Protocol (UDP)*, June 2005, http://tools.ietf.org/html/rfc4113

IETF RFC 4292, *IP Forwarding Table MIB*, April 2006, http://www.rfc-editor.org/rfc/rfc4292

IETF RFC 4293, *Management Information Base for the Internet Protocol (IP)*, April 2006, http://tools.ietf.org/rfc/rfc4293

IETF RFC 4898, *TCP Extended Statistics MIB*, May 2007, http://tools.ietf.org/rfc/rfc4898

IETF RFC 5132, *IP Multicast MIB*, December 2007, http://tools.ietf.org/rfc/rfc5132

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IETF RFC 5590, *Transport Subsystem for the Simple Network Management Protocol (SNMP)*, June 2009, http://tools.ietf.org/rfc/rfc5590

IETF RFC 5591, *Transport Security Model for the Simple Network Management Protocol (SNMP)*, June 2009, http://tools.ietf.org/rfc/rfc5591

IETF RFC 5592, *Secure Shell Transport Model for the Simple Network Management Protocol (SNMP)*, June 2009, http://www.rfc-editor.org/rfc/rfc5592

IETF RFC 5953, *Transport Layer Security (TLS) Transport Model for the Simple Network Management Protocol (SNMP)*, August 2010, http://www.rfc-editor.org/rfc/rfc5953

1 Under preparation. Stage at the time of publication: IEC CDV 62351-4:2017

IETF RFC 6347, *Datagram Transport Layer Security Version 1.2*, January 2012, *http://tools.ietf.org/rfc/rfc6347*

IETF RFC 6353, *Transport Layer Security (TLS) Transport Model for the Simple Network Management Protocol (SNMP)*, July 2011, *http://tools.ietf.org/rfc/rfc6353*

IETF RFC 7860, *HMAC-SHA-2, Authentication Protocols in User-Based Security Model (USM) for SNMPv3*, April 2016, http://tools.ietf.org/rfc/rfc7860

IETF RFC 8915, *Protocol Security for the Network Time Protocol*, September 2020, http://tools.ietf.org/rfc/rfc8915