



**SLOVENSKI STANDARD**  
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**Upravljanje elektroenergetskega sistema in pripadajoča izmenjava informacij - Varnost podatkov in komunikacij - 7. del: Podatkovni modeli pri upravljanju omrežij in sistemov (NSM)**

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

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

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)

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OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
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TITLE:

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

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

**Part 7: Network and System Management (NSM) data object models**

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

- 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:

FDIS	Report on voting
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57/1857/FDIS	57/1885/RVD
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Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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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

10

### 1 Scope

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

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

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

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

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

37 The objects that are already covered by existing MIBs are not defined here but are expected to  
38 be compliant with existing MIB standards.

39

### 2 Normative references

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

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

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

- 49 IEC 62351-3, *Power systems management and associated information exchange – Data and*  
50 *communications security – Part 3: Communication network and system security – Profiles*  
51 *including TCP/IP*
- 52 IEC 62351-4, *Power systems management and associated information exchange – Data and*  
53 *communications security – Part 4: Profiles including MMS<sup>1</sup>*
- 54 IEC 62351-5, *Power systems management and associated information exchange – Data and*  
55 *communications security – Part 5: Security for IEC 60870-5 and derivatives*
- 56 IEC TS 62351-8, *Power systems management and associated information exchange – Data*  
57 *and communications security – Part 8: Role-based access control*
- 58 IEC 62351-9, *Power systems management and associated information exchange – Data and*  
59 *communications security – Part 9: Cyber security key management for power system equipment*
- 60 IEEE 754:2008, *IEEE Standard for Floating-Point Arithmetic*
- 61 IETF RFC 2578, *Structure of Management Information Version 2 (SMIv2)*, April 1999,  
62 <http://tools.ietf.org/html/rfc2578>
- 63 IETF RFC 3410, *Introduction and Applicability Statements for Internet-Standard Management*  
64 *Framework*, December 2002, <http://tools.ietf.org/rfc/rfc3410>
- 65 IETF RFC 3414, *User-based Security Model (USM) for version 3 of the Simple Network*  
66 *Management Protocol (SNMPv3)*, December 2002, <http://tools.ietf.org/rfc/rfc3414>
- 67 IETF RFC 3826, *The Advanced Encryption Standard (AES) Cipher Algorithm in the SNMP User-*  
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- 69 IETF RFC 4022, *Management Information Base for the Transmission Control Protocol (TCP)*,  
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- 73 IETF RFC 4292, *IP Forwarding Table MIB*, April 2006, <http://www.rfc-editor.org/rfc/rfc4292>
- 74 IETF RFC 4293, *Management Information Base for the Internet Protocol (IP)*, April 2006,  
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- 76 IETF RFC 4898, *TCP Extended Statistics MIB*, May 2007, <http://tools.ietf.org/rfc/rfc4898>
- 77 IETF RFC 5132, *IP Multicast MIB*, December 2007, <http://tools.ietf.org/rfc/rfc5132>
- 78 IETF RFC 5905, *Network Time Protocol Version 4: Protocol and Algorithms Specification*, June  
79 2010, <http://tools.ietf.org/rfc/rfc5905>
- 80 IETF RFC 5590, *Transport Subsystem for the Simple Network Management Protocol (SNMP)*,  
81 June 2009, <http://tools.ietf.org/rfc/rfc5590>
- 82 IETF RFC 5591, *Transport Security Model for the Simple Network Management Protocol*  
83 *(SNMP)*, June 2009, <http://tools.ietf.org/rfc/rfc5591>
- 84 IETF RFC 5592, *Secure Shell Transport Model for the Simple Network Management Protocol*  
85 *(SNMP)*, June 2009, <http://www.rfc-editor.org/rfc/rfc5592>
- 86 IETF RFC 5953, *Transport Layer Security (TLS) Transport Model for the Simple Network*  
87 *Management Protocol (SNMP)*, August 2010, <http://www.rfc-editor.org/rfc/rfc5953>

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