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Power systems management and associated information exchange — Data and communications security

Part 90-3: Guidelines for network and system management

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee PEL/57, Power systems management and associated information exchange.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Part 90-3: Guidelines for network and system management

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 90-3: Guidelines for network and system management

FOREWORD

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IEC TR 62351-90-3 has been prepared by IEC technical committee 57: Power systems management and associated information exchange. It is a Technical Report.

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

DTR	Report on voting
57/2255/DTR	57/2337/RVDTR

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 Report is English.

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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/standardsdev/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.

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- withdrawn,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

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

Part 90-3: Guidelines for network and system management

1 Scope

This part of IEC 62351, which is a technical report, provides guidelines for efficiently handling both IT and OT data in terms of their monitoring, classification and correlations on them to deduce any possible useful outcomes about the state of the power system.

The convergence of information technologies (IT) and operational technologies (OT) refers to the integration of the systems, processes and data associated with the domains of IT and OT. This document provides guidelines for a comprehensive security monitoring for power grid components based on IT/OT convergent systems. The emphasis is about the development of a methodology and a set of recommendations for utility operators to build a general monitoring framework based on the analysis of the data collected from different IT and OT systems through network management, traffic inspection, and system activity readings. As such, the monitoring framework that this document introduces relies on the integration of management and logging information obtained using IEC 62351-7 and IEC 62351-14, respectively. Further systems and data sources from IT and OT would be considered such as the data obtained, for instance, through the IT network management using the Simple Network Management Protocol (SNMP), the passive network monitoring, and the functional characterization of control and automation processes.

This document's recommendations include the implementation of data collection, filtering and correlation mechanisms. The development of data analytics algorithms is out of the scope of this document and would be left to utility operators and owners. Finally, applications of the general monitoring framework guidelines and recommendations are provided for different power grid environments, namely for IEC 61850 substations and for Distributed Energy Resources (DER) systems.

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 and derivatives*

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

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

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

IEC TS 62351-14, *Power systems management and associated information exchange – Data and communications security – Part 14: Cyber Security Event Logging*[1]

IEC TR 62351-90-2, *Power systems management and associated information exchange – Data and communications security – Part 90-2: Deep packet inspection of encrypted communications*

IEC TR 61850-90-4, *Communication networks and systems for power utility automation – Part 90-4: Network engineering guidelines*

IEC 60870-5-101, *Telecontrol equipment and systems – Part 5-101: Transmission protocols – Companion standard for basic telecontrol tasks*

IEC 60870-5-104, *Telecontrol equipment and systems – Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles*

IEEE 1815-2012, *IEEE Standard for Electric Power Systems Communications-Distributed Network Protocol (DNP3)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TS 62351-2 and IEC 62351-7 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Abbreviated terms and acronyms

Additional abbreviated terms and acronyms are given in IEC TS 62351-2.

ASN.1	Abstract Syntax Notation One
DER	Distributed Energy Resource
DTLS	Datagram Transport Layer Security
DPI	Deep Packet Inspection
GIS	Geographical Information System
HMI	Human Machine Interface
ICS	Industrial Control System
IED	Intelligent Electronic Device

[1] Under preparation. Stage at the time of publication: IEC TS/PCC 62351-14:2021.

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