IEC 62382

Edition 3.0 2024-04

PRE-RELEASE VERSION (FDIS)

Control systems in the process industry – Electrical and instrumentation loop check

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 25.040.40

65E/1082/FDIS

FINAL DRAFT INTERNATIONAL STANDARD (FDIS)

PROJECT NUMBER: **IEC 62382 ED3**	
DATE OF CIRCULATION: **2024-04-26**	CLOSING DATE FOR VOTING: **2024-06-07**
SUPERSEDES DOCUMENTS: **65E/1024/CDV, 65E/1065/RVC**	

IEC SC 65E : DEVICES AND INTEGRATION IN ENTERPRISE SYSTEMS

SECRETARIAT: United States of America	SECRETARY: Mr David Richmond
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL STANDARD: ☐

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY

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TITLE:

Control systems in the process industry - Electrical and instrumentation loop check

PROPOSED STABILITY DATE: 2027

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CONTROL SYSTEMS IN THE PROCESS INDUSTRY – ELECTRICAL AND INSTRUMENTATION LOOP CHECK

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IEC 62382 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This third edition cancels and replaces the second edition published in 2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) general re-organization of the content of the previous edition, moving informative content to the annexes;
b) replacing the forms based on I/O type in IEC 62382:2012, Annex A to Annex E with an example of a generic loop check form;
c) providing additional references to other applicable standards.

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

Draft	Report on voting
65E/XX/FDIS	65E/XX/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.

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.

INTRODUCTION

The inspection and verification of the individual measurements and controls in conjunction with the control systems used to monitor these devices is referred to as loop check. In industry, numerous methods and philosophies are used to check the instrumentation and controls after mechanical installation within projects for modified or new facilities.

This document was created to provide a better understanding of what loop check consists of and also to provide a standard methodology for executing a loop check.

Annex A provides examples of checks for various loop components to aid the user in establishing the desired loop check plans for a specific project. Annex B provides an example of a loop check form.

CONTROL SYSTEMS IN THE PROCESS INDUSTRY – ELECTRICAL AND INSTRUMENTATION LOOP CHECK

1 Scope

1.1 General applicability

This document defines procedures and specifications for loop check, which comprises the activities between the completion of the loop construction (including installation and point-to-point checks) and the beginning of cold commissioning. This document is applicable for the construction of new plants and for expansion or retrofits (i.e. revamping) of electrical and instrument (E&I) installations in existing plants (including PLC, DCS, panel-mounted and field instrumentation). It does not include a detailed checkout of power distribution systems, except as they relate to the loops being checked (i.e. a motor starter or a power supply to a four-wire transmitter). Loop checks can be performed throughout the lifecycle of the plant. This document is also applicable when loop checks are performed after commissioning. This document describes what is intended to be tested but not how the test is performed, due to the wide range of technologies and equipment available.

The intent of this document is to provide a means for all parties, including the owner, the installer and the vendor, to clearly establish and agree on the scope of activities and responsibilities involved in performing these tests in order to achieve a timely delivery and acceptance of the automation system. The activities described in this document can be taken as a guideline and adapted to the specific requirements of the process, plant or equipment.

1.2 Exclusions

1.2.1 Prior and post activities

Engineering and manufacturing activities prior to or after the loop checks, such as FAT, SAT, SIT and commissioning, are not covered by this document.

1.2.2 Regulated industries

For applications in the pharmaceutical or other highly specialized industries, additional guidelines (e.g. good automated manufacturing practice (GAMP)), definitions and stipulations apply in accordance with existing standards.

1.2.3 Safety instrumented systems

All loops are checked in accordance with this document. However, loops involved in safety instrumented systems are subjected to additional testing. The IEC 61511 series provides requirements for checks and validation of safety instrumented systems.

1.2.4 Manufacturing execution systems

Testing and verification of manufacturing execution systems (MES) is not covered by this document.

1.2.5 Advanced process control

Testing and verification of advanced process control (APC) are not covered by this document.

1.2.6 Security for industrial automation and control systems

The IEC 62443 series provides requirements for network and system security.

1.2.7 User-specific procedures and requirements

This document does not describe any user-specific procedures and requirements that can be related to loop check, e.g. positioning of process isolation valves, what state to leave the loop in after check, calibration. It is the user's responsibility to ensure that these are added to the loop check requirements as necessary.

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 62381, *Automation systems in the process industry – Factory acceptance test (FAT), site acceptance test (SAT), and site integration test (SIT)*