SLOVENSKI STANDARD
SIST EN IEC 62881:2019

01-februar-2019

Preglednica vzrokov in učinkov (IEC 62881:2018)

Cause and Effect Matrix (IEC 62881:2018)

Ursache-Wirkungstabelle (IEC 62881:2018)

Matrice des causes et effets (IEC 62881:2018)

Ta slovenski standard je istoveten z: **EN IEC 62881:2018**

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control

SIST EN IEC 62881:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62881

November 2018

ICS 25.040.40

English Version

Cause and Effect Matrix (IEC 62881:2018)

Matrice des causes et effets
(IEC 62881:2018)

Ursache-Wirkungstabelle
(IEC 62881:2018)

This European Standard was approved by CENELEC on 2018-11-14. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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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 65/701/FDIS, future edition 1 of IEC 62881, prepared by IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62881:2018.

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) 2019-08-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-11-14

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Endorsement notice

The text of the International Standard IEC 62881:2018 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 standards indicated:

IEC 61131-3	NOTE	Harmonized as EN 61131-3
IEC 61508-1	NOTE	Harmonized as EN 61508-1
IEC 61511-1:2016	NOTE	Harmonized as EN 61511-1:2017 (not modified)
IEC 61511-1:2016/A1:2017	NOTE	Harmonized as EN 61511-1:2017/A1:2017 (not modified)
IEC 61511-2	NOTE	Harmonized as EN 61511-2
IEC 62061	NOTE	Harmonized as EN 62061
IEC 62381:2012	NOTE	Harmonized as EN 62381:2012 (not modified)
ISO 10418:2003	NOTE	Harmonized as EN ISO 10418:2003 (not modified)
ISO 10628-1	NOTE	Harmonized as EN ISO 10628-1
ISO 10628-2	NOTE	Harmonized as EN ISO 10628-2

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.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62708	-	Documents kinds for electrical and instrumentation projects in the process industry	EN 62708	-
IEC 81346-1	-	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 1: Basic rules	EN 81346-1	-
ISO 7200	-	Technical product documentation - Data fields in title blocks and document headers	EN ISO 7200	-

IEC 62881

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Cause and effect matrix

Matrice des causes et effets

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 25.040.40

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CAUSE AND EFFECT MATRIX

FOREWORD

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International Standard IEC 62881 has been prepared by IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this standard is based on the following documents:

FDIS	Report on voting
65/701/FDIS	65/711/RVD

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

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

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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Efficient engineering and reliable operation of automated plants strongly depend on clear and unambiguous description of regulatory controls and logic interlocks. For regulatory controls this description can typically be done for example via process flow diagrams and P&IDs (ISO 10628), which are accepted by process and I&C staff in engineering and operation of manufacturing and process plants. Regarding logic interlocks the widely distributed logic or functional diagrams are very often regarded by process engineers and plant operators as too complex (especially when using the fail-safe principle) and overloaded with detailed information.

This document describes a simple and widely accepted method to document logic interlocks in process and manufacturing industries – the "cause and effect matrix" (C&E matrix). C&E matrices can be applied with minimal previous knowledge and easy handling to describe the functions required for controlling a process independently from the automation platform used. They enable a sound understanding of the required relation from a process point of view without the need of detailed knowledge of the platform specific corresponding PLC/DCS program logic.

During the entire life cycle of a plant (e.g. engineering, commissioning, start-up and operation) C&E matrices are very useful to illustrate the functionalities of package units and their interfaces to related sections of the plant. In particular they support the fulfilment of legal or insurance requirements (e.g. governmental regulations, fire and gas regulations, machinery directives such as IEC 62061). It is possible to find C&E matrices included in other types of documents, for example fire protection datasheets but still the principle of identification of the cause and the effects and their logical relations defined in an intersection applies.

In addition, they can be used to illustrate the consequences of embedded diagnostic functions (e.g. activation of a trip function in case of detection of a broken wire), the functionality of installed back-up systems (e.g. fail to start a pump and switch over to a second one) or the required operator actions to reset plant sections or safety related functions after partial shut downs.

The information presented by C&E matrices might be structured according to the individual needs, for example information necessary for process interlocks in electrical switch gears.

C&E matrices describe the relationship between causing conditions – the causes – and the required outcome or actions – the effects. The causes are herein represented by signals created by sensors or other means of information; effects are actions automatically done by actuators (mainly valves and motors) or manually by shift operators, or alarms and messages provided to operators. Both are linked via a matrix containing the relations. These basic relations are hence documented in an appropriate and structured form enabling a reliable information exchange at the interface between process design, electrical engineering, I&C engineering, etc. In the further course of detail engineering C&E matrices are used as a starting point for the development of more detailed and platform specific (e.g. fail-safe PLC) logic enhancements.

During plant operation the C&E matrices can serve as functional descriptions, for example for the training of plant operation staff.

However, C&E matrices typically are not designed to specify functional sequences (e.g. batch mode of operation) or functional details as might be provided by other methods, for example logic descriptions complying with IEC 61131-3.