SVENSK STANDARD SS-EN 62424

Fastställd	Utgåva	Sida	Ansvarig kommitté
2010-08-23	1	1 (1+135)	SEK TK 65

Representation av industriella processer – Krav i P&I-scheman och datautbyte mellan P&ID-verktyg och PCE-CAE-verktyg

Representation of process control engineering – Requests in P&I diagrams and data exchange between P&ID tools and PCE-CAE tools

Som svensk standard gäller europastandarden EN 62424:2009. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62424:2009.

Nationellt förord

Europastandarden EN 62424:2009

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC

– **IEC 62424, First edition, 2008 - Representation of process control engineering - Requests in P&I diagrams and data exchange between P&ID tools and PCE-CAE tools**

utarbetad inom International Electrotechnical Commission, IEC.

ICS 35.240.50; 25.040.40

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62424

August 2009

ICS 35.240.50; 25.040.40

English version

Representation of process control engineering - Requests in P&I diagrams and data exchange between P&ID tools and PCE-CAE tools

(IEC 62424:2008)

Représentation de l'ingénierie du contrôle-commande des processus - Requêtes dans les diagrammes P&ID et échanges de données entre les outils P&ID et PCE-CAE (CEI 62424:2008)

Darstellung von Aufgaben der Prozessleittechnik - Fließbilder und Datenaustausch zwischen EDV-Werkzeugen zur Fließbilderstellung und CAE-Systemen (IEC 62424:2008)

CENELEC

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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 62424:2009 E

SEK Svensk Elstandard

Foreword

The text of document 65/420/FDIS, future edition 1 of IEC 62424, prepared by IEC TC 65, Industrial-process measurement, control and automation, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62424 on 2009-07-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2010-04-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2012-07-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62424:2008 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 60848	NOTE	Harmonized as EN 60848:2002 (not modified).
IEC 61512-1	NOTE	Harmonized as EN 61512-1:1999 (not modified).
IEC 61987-1	NOTE	Harmonized as EN 61987-1:2007 (not modified).
ISO 13628-6	NOTE	Harmonized as EN ISO 13628-6:2006 (not modified).
ISO 13703	NOTE	Harmonized as EN ISO 13703:2000 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 61346-1	-[1)]	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 1: Basic rules	EN 61346-1	1996[2)]
IEC 61511-1	-[1)]	Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and software requirements	EN 61511-1	2004[2)]
ISO 10628	-[1)]	Flow diagrams for process plants - General rules	EN ISO 10628	2000[2)]
ISO 13849-1	-[1)]	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design	EN ISO 13849-1	2008[2)]
XML 1.0	2004	Extensible Markup Language, W3C Recommendation	-	-

[1)] Undated reference.

[2)] Valid edition at date of issue.

CONTENTS

INTRODUCTION

Efficient process engineering requires highly sophisticated tools for the different needs of the involved work processes and departments. These engineering tools are normally specialized in Process Design (PD), in Process Control Engineering (PCE), etc. Therefore a working interoperability is essential to optimize the engineering process in total. Thus, the definition of a harmonized interface and data management is a core task to ensure a smooth workflow during the whole project and to guarantee data consistency in the different tools.

This standard defines procedures and specifications for the exchange of PCE relevant data provided by the Piping and Instrumentation Diagram (P&ID) tool. The basic requirements for a change management procedure are described. A generally accepted technology for machine information exchange, the Extensible Markup Language (XML) is used. Hereby, a common basis is given for information integration.

However, a definition for uniform semantics is still necessary. CAEX (Computer Aided Engineering eXchange) as it is defined in this document is an appropriate data format for this purpose. This concept of data exchange is open for different applications.

The main task of a data exchange is transporting/synchronizing information from the P&ID database to the PCE databases and vice versa. The owner's reference designation system and a unique description of the processing requirement is the key for a unique identification. For detailed information about representation of PCE loops in P&ID's see Clause 6.

The data exchange system may be a stand-alone, vendor independent application or a module in an engineering environment. The data between a P&ID tool and a PCE tool and vice versa is exchanged via CAEX.

After the data exchange, there are three places where information about the plant is stored. Both the proprietary databases of the considered tools include private and common information. Both are stored at different places and different divisions that are working on them. Hereby, the intermediate database CAEX only stores common information. In a wider approach, the intermediate database should store both common and private information. This becomes important if a third application is connected to the neutral database. If the intermediate database is used as a temporary data stream only (without storing the information in a file), the information will be lost after processing the data conciliation.

Figure 1 illustrates the information flow for the P&ID and the PCE database reconciliation. The data exchange is done via a neutral intermediate CAEX database, not directly from database to database. The intermediate CAEX database should be a file (for file based data exchange) or a stream (for network based data exchange). The term “CAEX database” within this standard has to be understood in this way, it does not denominate a database product as e. g. SQL.

Annex C of this standard contains the full XML schema of the CAEX Model. It is attached to this publication in XSD format.

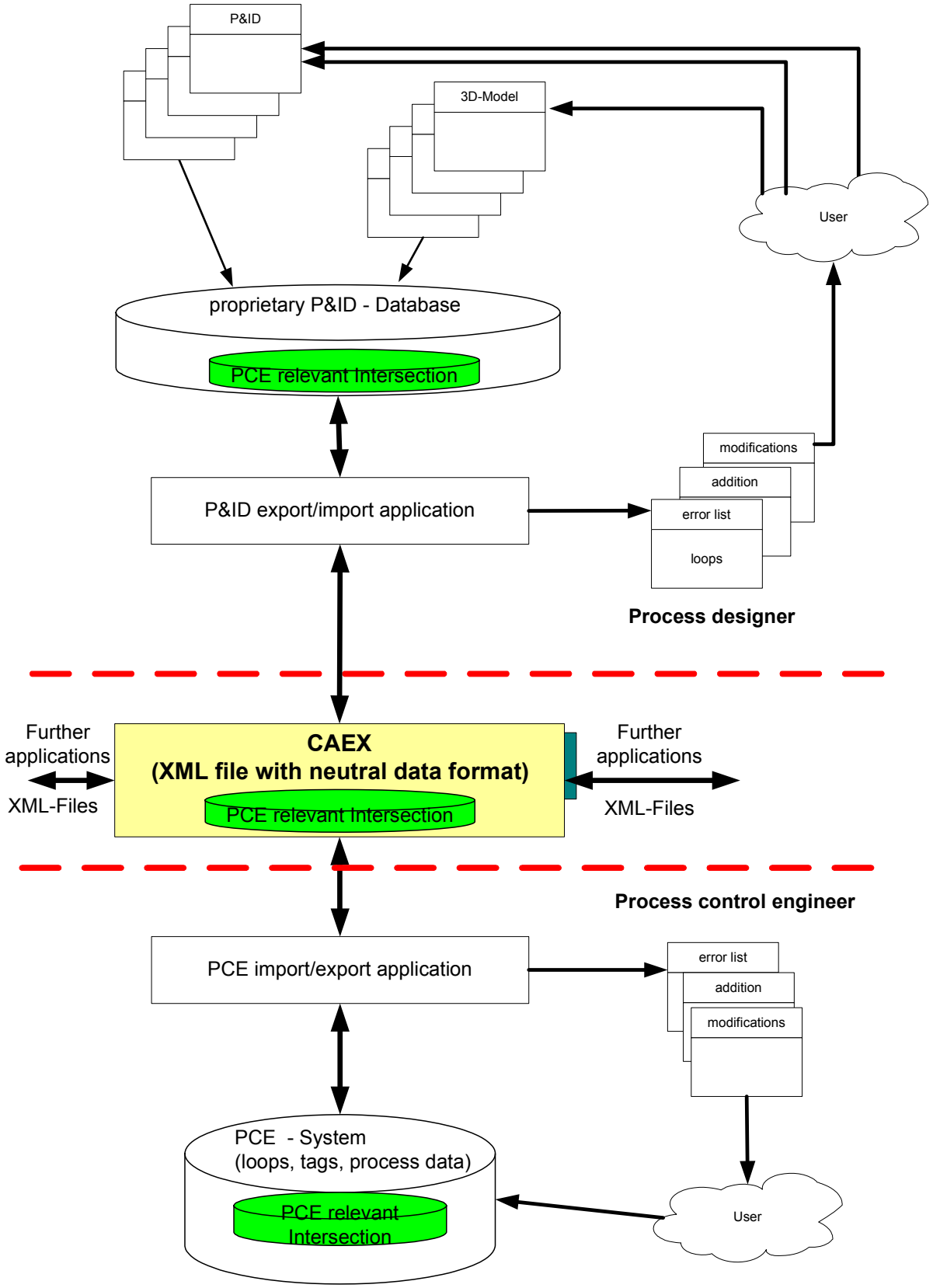

Figure 1 – Information flow between P&ID and PCE tool

REPRESENTATION OF PROCESS CONTROL ENGINEERING – REQUESTS IN P&I DIAGRAMS AND DATA EXCHANGE BETWEEN P&ID TOOLS AND PCE-CAE TOOLS

1 Scope

This International Standard specifies how process control engineering requests are represented in a P&ID for automatic transferring data between P&ID and PCE tool and to avoid misinterpretation of graphical P&ID symbols for PCE.

It also defines the exchange of process control engineering request relevant data between a process control engineering tool and a P&ID tool by means of a data transfer language (called CAEX). These provisions apply to the export/import applications of such tools.

The representation of the PCE functionality in P&ID'S will be defined by a minimum number of rules to clearly indicate their category and processing function, independent from the technique of realization (see Clause 6). The definition of graphical symbols for process equipment (e. g. vessels, valves, columns, etc.), their implementation and rules for the reference designation system are not in the scope of this standard. These rules are independent from this standard.

Clause 7 specifies the data flow between the different tools and the data model CAEX.

2 Normative references

The following referenced documents are indispensable for the application 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 61346-1, *Industrial systems, installations and equipment and industrial products – Structuring principles and reference designations – Part 1: Basic rules*

IEC 61511-1, *Functional safety – Safety instrumented systems for the process industry sector – Part 1: Framework, definitions, system, hardware and software requirements*

ISO 10628, *Flow diagrams for process plants – General rules*

ISO 13849-1, *Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design*

Extensible Markup Language (XML) 1.0 (Third Edition), W3C Recommendation 04 February 2004, available at <http://www.w3.org/TR/2004/REC-xml-20040204/>