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Enterprise-control system integration —

Part 4:
Objects and attributes for manufacturing operations management integration

Intégration des systèmes entrepose-contrôle —

Partie 4: Attributs des modèles d'objets pour l'intégration de la gestion des opérations de fabrication

Please see the administrative notes on page ii

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Reference number
IEC/FDIS 62264-4:2015(E)

This final draft is submitted to a parallel approval vote in ISO and IEC. Each ISO member body and IEC national committee is requested to take appropriate steps to harmonize the national viewpoint in order to cast the same “yes” or “no” vote to both ISO and IEC.

Positive votes shall not be accompanied by comments.

Negative votes shall be accompanied by the relevant technical reasons.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ENTERPRISE-CONTROL SYSTEM INTEGRATION –

Part 4: Object model attributes for manufacturing operations management integration

FOREWORD

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International Standard IEC 62264-4 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of 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
65E/XX/FDIS	65E/XX/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.

A list of all parts in the IEC 62264 series, published under the general title *Enterprise-control system integration*, can be found on the IEC website.

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- withdrawn,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.

The National Committees are requested to note that for this publication the stability date is 2020.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

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

This part of IEC 62264 defines the interfaces between enterprise activities and control activities and is to be used in conjunction with IEC 62264-3.

The scope of this part of IEC 62264 is limited to defining the details of the information content of interfaces within manufacturing operations management. The scope is limited to the definition of object models and attributes for the information defined in IEC 62264-3. The goal is to reduce the effort, cost, and errors associated with implementing these interfaces.

The standard may be used to reduce the effort associated with implementing new product offerings. The goal is to have enterprise systems and control systems that interoperate and easily integrate.

This part of IEC 62264 further defines the object models and attributes involved in data exchange between activities of manufacturing operations management defined in 62264-3. The models and terminology defined in IEC 62264-3 and this part of IEC 6226

a) emphasize good manufacturing operations management integration practices during the entire life cycle of the systems;
b) can be used to improve existing integration capability of manufacturing operations management systems; and
c) can be applied regardless of the degree of automation.

Specifically, IEC 62264-3 and this part of IEC 62264 provide a standard terminology and a consistent set of concepts and models for integrating manufacturing operations management systems that will improve communications between all parties involved. Benefits produced will

d) reduce the user's time to reach full production levels for new products;
e) enable vendors to supply appropriate tools for implementing integration of manufacturing operations management systems;
f) enable users to better identify their needs;
g) reduce the cost of automating manufacturing processes;
h) optimize supply chains; and
i) reduce life-cycle engineering efforts.

IEC 62264-3 and this part of IEC 62264 may be used to reduce the effort associated with implementing new product offerings. The goal is to have manufacturing operations management systems that interoperate and easily integrate.

It is not the intent of the standards to

1) suggest that there is only one way of implementing integration of manufacturing operations management systems;
2) force users to abandon their current way of handling integration; or
3) restrict development in the area of integration of manufacturing operations management systems.

ENTERPRISE-CONTROL SYSTEM INTEGRATION –

Part 4: Object model attributes for manufacturing operations management integration

1 Scope

This part defines object models and attributes exchanged between Level 3 manufacturing operations management activities defined in IEC 62264-3.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62264-1:2013, *Enterprise-control system integration – Part 1: Models and terminology*

IEC 62264-2:2013, *Enterprise-control system integration – Part 2: Object and attributes for enterprise-control system integration*

IEC 62264-3, *Enterprise-control system integration – Part 3: Activity models of manufacturing operations management*

IEC 61512-1, *Batch control – Part 1: Models and terminology*

IEC 61512-4:2009, *Batch control – Part 4: Batch production records*

IEC 62682, *Management of alarm systems for the process industries*

ISO/IEC 19501, *Information technology – Open Distributed Processing – Unified Modeling Language (UML) Version 1.4.2*

ISO/IEC 19505-1, *Information technology – Object Management Group Unified Modeling Language (OMG UML) – Part 1: Infrastructure*

ISO/IEC 19505-2, *Information technology – Object Management Group Unified Modeling Language (OMG UML) – Part 2: Superstructure*

ISO 8601, *Data elements and interchange formats – Information interchange – Representation of dates and times*

3 Terms, definitions, abbreviations and conventions

3.1 Terms and definitions

For the purposes of this document the terms and definitions given in IEC 62264-1 as well as the following apply.

3.1.1
batch production record
BPR
subset of the execution and business information that is retained based upon business requirements identified by the batch production record specification

Note 1 to entry: This note applies to the French language only.

[SOURCE: IEC 61512-4:2009, 3.2]

3.1.2
job list
collection of job orders for one or more work centers and/or resources for a specific time frame

3.1.3
job order

unit of scheduled work that is dispatched for execution

3.1.4
job response
information on the result of execution of a job order

3.1.5
job response list
collection of job responses for one or more work centers and/or resources for a specific time frame

3.1.6
resource relationship network
one or more expressions of a relationship between two or more resources

3.1.7
work alert
notification of a Level 3 event that does not require acknowledgement

3.1.8
work calendar
collection of work calendar entries

3.1.9
work calendar entry
information about a specific time period

3.1.10
work capability
collection of information about the resources for work for selected future and past times

3.1.11
work definition
collection of information about resources and workflow specification associated with job orders

3.1.12
work directive
type of work definition derived from a work master and used to perform a specific job order

3.1.13
work KPI
key performance indicator related to Level 3 activities

3.1.14
work master
type of work definition that is a template for work to be performed for a job order

3.1.15
work performance
collection of work responses

Note 1 to entry: This note applies to the French language only.

3.1.16
work master capability
collection of information about the resources for selected future and past times for a specific work master

3.1.17
work record
subset of the execution and business information that is retained based upon business requirements

3.1.18
work request
collection of job orders

3.1.19
work response
collection of job responses

3.1.20
work schedule
detailed schedule of MOM activities as a collection of work requests

3.1.21
workflow specification
information representing work as a pattern of activities used to orchestrate the execution of procedures

EXAMPLE A repeatable sequence of procedures, enabled by an organization of resources with defined roles corresponding to flows of mass, energy or information.

3.2 Symbols and abbreviations

BPMN Business Process Model and Notation

BPR Batch production record

ERP Enterprise resource planning

ID Identifier

KPI Key performance indicator

MES Manufacturing execution system

MOM Manufacturing operations management

SOP Standard operating procedures

UML Unified Modeling Language

UTC Coordinated Universal Time

3.3 Conventions

Italics are used, beyond the use defined in ISO/IEC Directives Part2, to emphasize the 62264 specific meaning of terminology. They are used for the following cases:

– Names of objects used in exchanged data

4 Information exchange between manufacturing operations

4.1 Activity information exchange network

A set of models are used to represent the information exchanged between activities defined in IEC 62264-3. This is illustrated in Figure 1 with each information model represented as black rounded rectangles. This part of IEC 62264 defines models of information which can be exchanged between Level 3 activities (represented as ellipses in the figure) within an operational category or across operational categories. IEC 62264-2 defines models of information that may be exchanged between Level 4 activities and Level 3 activities and are represented as yellow rounded rectangles. Other information (represented as hashed elements) shown in Figure 1 is defined in other standards, such as IEC 61512 and IEC 62541.

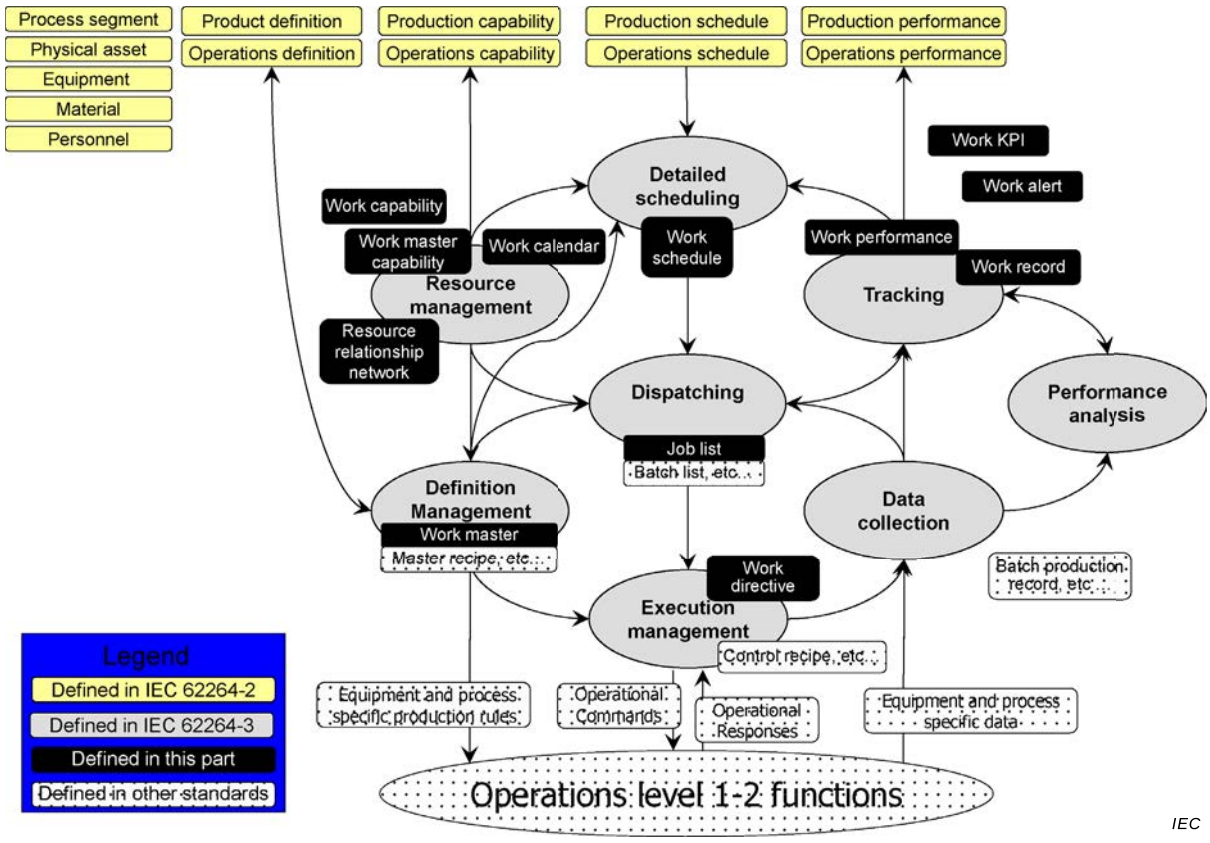


Figure 1 – Information exchange models for manufacturing operations management

NOTE IEC 61512 defines object models that relate to the lower elements of the Level 3 activities and defines the information used to create and manage master recipes, control recipes, batch lists, and batch production records. Equivalent structures, or IEC 61512 structures, could be used for other types of production. This standard does not redefine these objects.