TECHNICAL SPECIFICATION

ISO/TS 15926-4

First edition
2007-10-01

Industrial automation systems and integration — Integration of life-cycle data for process plants including oil and gas production facilities —

Part 4: Initial reference data

Systèmes d'automatisation industrielle et intégration — Intégration de données de cycle de vie pour les industries de «process», y compris les usines de production de pétrole et de gaz —

Partie 4: Données de référence initiales

Reference number
ISO/TS 15926-4:2007(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Tables

Figures

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electro technical Commission (IEC) on all matters of electro technical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50% of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed every three years with a view to deciding whether it can be transformed into an International Standard.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 15926-4 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 4, *Industrial data*.

ISO 15926 consists of the following parts, under the general title *Industrial automation systems and integration — Integration of life-cycle data for process plants including oil and gas production facilities*:

— *Part 1: Overview and fundamental principles*

— *Part 2: Data model*

— *Part 4: Initial reference data* [Technical Specification]

The following parts are under preparation:

— *Part 3: Ontology for geometry and topology* [Technical Specification]

— *Part 7: Implementation methods for data exchange and integration* [Technical Specification]

A complete list of parts of ISO 15926 is available from the Internet:

<http://www.tc184-sc4.org/titles/OIL_GAS_Titles.htm>

Introduction

ISO 15926 is an International Standard for the representation of process industries facility life-cycle information. This representation is specified by a generic, conceptual data model that is suitable as the basis for implementation in a shared database or data warehouse. The data model is designed to be used in conjunction with reference data, i.e. standard instances that represent information common to a number of users, production facilities, or both. The support for a specific life-cycle activity depends on the use of appropriate reference data in conjunction with the data model.

ISO 15926 is organized as a series of parts, each published separately. This part of ISO 15926 specifies the initial set of reference data items.

The structure of ISO 15926 is as follows:

— ISO 15926-1 provides an overview of ISO 15926;

— ISO 15926-2 contains a generic, conceptual data model that supports representation of all life-cycle aspects of a process plant;

— ISO/TS 15926-3[1] contains a reference data library for geometry and topology;

— ISO/TS 15926-4 contains a reference data library for physical objects, activities, properties and other reference data necessary to record information about a process plant;

— ISO 15926-5[2] specifies the procedures to be followed for the maintenance of the reference data library ISO/TS 15926-4;

— ISO 15926-6[3] specifies the information that is recorded for reference data items of ISO/TS 15926-4;

— ISO/TS 15926-7[4] specifies implementation methods for the integration of distributed systems.

[1] To be published.

[2] Under preparation.

[3] Under preparation.

[4] To be published.

Industrial automation systems and integration — Integration of life-cycle data for process plants including oil and gas production facilities —

Part 4: Initial reference data

1 Scope

This part of ISO 15926 specifies the initial set of core reference data items which can be used to record information about process plants, including oil and gas production facilities.

The following are within the scope of this part of ISO 15926:

— core classes for process plants, including oil and gas production facilities;

NOTE 1 Reference data items can be core classes, de facto classes, commodity classes and manufactured product classes. Reference data items can also be standard classes or proprietary classes.

The terms for the different types of class are defined in 3.2. A discussion about the different types of classes is contained in Annex D.

— the unique name for each reference data item;

— the definition of each reference data item;

— subclass and classification relationships between reference data items;

NOTE 2 Each reference data item that is a class is directly or indirectly a subclass of an entity in ISO 15926-2.

— the entity within ISO 15926-2 which can be used to record each reference data item.

The following are outside the scope of this part of ISO 15926:

— data requirements for additional reference data;

— a numeric identifier for each reference data item;

NOTE 3 Numeric identifiers may be assigned by a registration authority.

— the procedures to be followed for registration and maintenance of additional reference data.

NOTE 4 A core class defined by this part of ISO 15926 can be used by ISO 15726-2, ISO/TS 15926-7 or ISO 10303-221.

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.

ISO/IEC 8824-1:2002, *Information technology — Abstract Syntax Notation One (ASN.1) — Part 1: Specification of basic notation*

ISO 10303-1:1994, *Industrial automation systems and integration — Product data representation and exchange — Part 1: Overview and fundamental principles*

ISO 15926-1:2004, *Industrial automation systems and integration — Integration of life-cycle data for process plants including oil and gas production facilities — Part 1: Overview and fundamental principles*

ISO 15926-2:2003, *Industrial automation systems and integration — Integration of life-cycle data for process plants including oil and gas production facilities — Part 2: Data model*

3 Terms, definitions, and abbreviations

3.1 Terms defined in ISO 10303-1

For the purposes of this document, the following terms and definitions given in ISO 10303-1 apply. They are repeated below for convenience.

3.1.1
data
representation of information in a formal manner suitable for communication, interpretation, or processing by human beings or computers

3.1.2
information
facts, concepts, or instructions

3.2 Terms defined in ISO 15926-1

For the purposes of this document, the following terms and definitions given in ISO 15926-1 apply. They are repeated below for convenience.

3.2.1
class
category or division of things based on one or more criteria for inclusion and exclusion

NOTE 1 A class need not have any members (things that satisfy its criteria for membership).

NOTE 2 Because the spatio-temporal paradigm is used to define individuals in this part of ISO 15926, all classes are non-well-founded sets. These are explained in ISO 15926-2:2003, D.2.4

3.2.2
commodity product class
manufactured product class whose members conform to open agreed standards

NOTE Commodity product classes have sufficient characterization to indicate suitability of use. They are specializations of one or more de facto classes, standard classes, or both. The resulting specification is non-proprietary, as no one organization controls it.

EXAMPLE The type of light bulb known as 60 W 230 V E27 is a commodity class.

3.2.3
core class
class that is a commonly used subdivision corresponding to terms used in common language

NOTE The conditions for membership are often not formally defined; understanding of the class may be conveyed by example.

EXAMPLE Pipe, floor, pump, and light bulb are all core classes.

3.2.4
de facto class
class corresponding to common natures that are widely recognized but not formally agreed or defined

NOTE De facto classes may be formalized by international, national, or industry agreement.

EXAMPLE 1 A manufacturer may choose to make a product of similar specification to that of another manufacturer in order to compete for the market share by choosing to conform to some characteristics of the other product.

EXAMPLE 2 3.5" floppy disk and HB pencil are de facto classes.

3.2.5
manufactured product class
class whose members are individuals produced by a manufacturing process

NOTE 1 The members of a manufactured product class may be discrete or may be batches or continuous flows, such as process fluids.

NOTE 2 A manufactured product class may correspond to a specification that has not been realized, such as a product specification for which no products have been made.

EXAMPLE 1 "Lightbulbs 60 W 230 V E27" is an example of a manufactured product class whose members are discrete.

EXAMPLE 2 "BS4040 Leaded Petrol" is an example of a manufactured product class whose members are continuous.

3.2.6
proprietary class
class whose specification for membership is owned, controlled, or protected by an organization and is not generally available outside that organization

3.2.7
proprietary product class
class that is a manufactured product class and a proprietary class

NOTE Proprietary product classes are specializations that depend on rules of inclusion and exclusion some of which are controlled in a closed way. This means that some aspects of the specification can be arbitrarily changed. Many proprietary product classes are specializations of commodity product classes, de facto classes, or both, where the additional restrictions reflect design or manufacturing details that the manufacturer uses to differentiate his product from others of the same general type.

EXAMPLE 1 A product specification that is owned by a commercial organization, and is marketed under and protected by a registered trade name, is the basis for a proprietary product class.

EXAMPLE 2 Lightbulbs 60 W 230 V E27 manufactured by Phillips are members of a proprietary product class.

3.2.8
reference data
process plant life-cycle data that represents information about classes or individuals which are common to many process plants or of interest to many users

3.2.9 reference data library (RDL)
managed collection of reference data

3.2.10
standard class
class whose specification for membership is owned or controlled by a standardization body and is publicly available

NOTE Standard classes result from the work of national, international, or industry standardization bodies and cover sizes, shapes, materials, performance, and manufacturing processes of equipment and materials. The rules for exclusion and inclusion (or conformance) are agreed by an open, consensus process and are made publicly available. A standard class may only constrain one particular aspect and often be insufficient to determine usage or full manufacturing specifications.

EXAMPLE 1 The ASME B16.9 standard constrains the dimensions and shapes of steel buttwelding pipe fittings.

EXAMPLE 2 The IEC 60079-1 standard specifies constraints on electrical equipment to ensure standard degrees of explosion proofness.

3.3 Other terms and definitions

For the purposes of this document, the following terms and definition apply.

3.3.1
reference data item
thing that is defined within a reference data library

NOTE A registration authority may regard a reference data item as an administered item as defined in ISO/IEC 11179-6.

3.4 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

ID identifier

RDL Reference Data Library (see 3.2.9)

URL Uniform Resource Locator

URN Uniform Resource Name

4 Initial reference data

4.1 Sets of reference data items

The sets of reference data items defined by this part of ISO 15926 are listed in Table 1.

Table 1 — Sets of reference data items

name of set	description of set
activity	activities, including physical processes carried out within process plants and engineering activities carried out by people
basics	generic engineering classes which are referenced by other sets, but which are not specific to an engineering discipline
class of class	classifications of classes for information management purposes
connection material	equipment items and features of equipment items which are involved in the making of process connections
electrical	electrical equipment items including motors, generators, uninterruptible power supplies and transmission and distribution equipment
encoded information	languages and formats for information
control function	functions implemented by automatic control systems
heat transfer	heat transfer equipment
information	document types, including documents which specify process plant operations, and identifier types
instrumentation	equipment items involved in monitoring, communications, recoding and control
ISO 15926-2 super-classes	ISO 15926-2 entities which are superclasses of reference data items in this part of ISO 15926, or which have reference data items in this part of ISO 15926 as instances
piping	pipes and piping components
property	physical quantities and physical properties possessed by equipment items
protection	insulation (thermal and electrical) and safety systems for the protection of personnel and equipment
solid handling	handling of solid objects, including billets and particulate materials
static equipment	static process equipment, excluding heat exchangers, valves and piping. Within scope are tanks and vessels, reactors, separators, filters and static mixers.
transport	vehicles, and associated civil and marine structures and facilities
uom	units of measure and scales
valve	valves (for the control or prevention of fluid flow)

4.2 Representation of the reference data

Each set of reference data items listed in clause 4.1 is represented as a separate spreadsheet.