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TECHNICAL REPORT

ISA-TR95.01-2018

Enterprise-Control System Integration – TR01: Master Data Profile Template

Approved 1 November 2018

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Enterprise-Control System Integration – TR01: Master Data Profile Template

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CONTENTS

INTRODUCTION	9
1 Scope	10
2 References	11
3 Terms and definitions	11
4 Master data profile overview.....	12
4.1 Profile as specification of semantical rules	12
4.2 Profile template and profile use	12
4.3 Use of a profile in applications.....	13
4.4 Possible master data profile implementations	14
4.5 Content of a master data profile template	15
4.6 Value ranges	16
5 Profile identification.....	17
6 Types of enumerations	18
6.1 Units of measure	18
6.2 Data types	18
6.3 Value and quantity attribute keys	19
6.4 Enumerations	19
6.5 Other enumerations	20
7 Operations location	21
7.1 Operational location classes	21
7.2 Operational location class properties	21
8 Process segment	22
8.1 Process segments	22
8.2 Process segment parameters	22
8.3 Segment data	23
9 Operations events	23
9.1 Operations event classes	23
9.2 Operations event class properties.....	23
9.3 Operations event definition	24
9.4 Operations event definition properties	24
10 Material.....	25
10.1 Material classes	25
10.2 Material class properties.....	25
10.3 Material definitions	26
10.4 Material definition properties	26
11 Role-based equipment	27
11.1 Equipment classes	27
11.2 Equipment class properties.....	27
12 Personnel.....	28
12.1 Personnel classes	28

12.2	Personnel class properties	28
13	Physical asset	28
13.1	Physical asset classes	28
13.2	Physical asset class properties	29
14	Resource relationship network	29
14.1	Resource relationship network	29
14.2	Resource relationship network properties	29
14.3	Resource relationship connection types	30
14.4	Resource relationship connection type property	30
15	Work alert	30
15.1	Work alert definitions	30
15.2	Work alert definition properties	30
16	Work calendar	31
16.1	Work calendar definitions	31
16.2	Work calendar definition properties	31
16.3	Work calendar definition entries	31
16.4	Work calendar definition entry properties	32
17	Operations test	32
17.1	Test specification	32
17.2	Test specification property	33
17.3	Test specification criteria	33
17.4	Evaluated property	33
18	Workflow specification types	33
18.1	Workflow specification node type	33
18.2	Workflow specification node property type	34
18.3	Workflow specification connection type	34
18.4	Workflow specification connection property type	34
19	Work master {pattern}	34
19.1	Work master	34
19.2	Work master specification elements	35
19.3	Work master parameters	35
20	Operations definition {pattern}	36
20.1	Operations definition	36
20.2	Operations material bill	36
20.3	Operations material bill Item	36
20.4	Operations segment	37
20.5	Segment dependency	37
20.6	Operations segment specification elements	38
20.7	Operations segment parameters	38
21	Data exchange scenarios	39
Figure 1 – Example of profile template and profile use		13
Figure 2 – Manual configuration after profile import		14

Figure 3 – Example transaction scenarios	39
Table 1 – Value range specifications	17
Table 2 – Example of units of measure used in a profile	18
Table 3 – Example of data types defined in a profile	19
Table 4 – Example of enumerations defined in a profile	20
Table 5 – Example of other enumeration values	21
Table 6 – Example of operational location classes	21
Table 7 – Example of operational location class properties	22
Table 8 – Example of process segments	22
Table 9 – Example of process segment parameters	23
Table 10 – Example of material classes	25
Table 11 – Example of material class properties	26
Table 12 – Example of material definitions	26
Table 13 – Example of material definition properties	27
Table 14 – Example of equipment classes	27
Table 15 – Example of equipment class properties	28

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INTRODUCTION

This technical report serves as a specification intended for developers of applications using the ISA-95 object models and transactions. It defines a template for the definition of profiles for master data used in data exchanges. Master data profiles define the specific semantics of exchanged master data information, such as enumeration values, transactions, property IDs, and property ranges that would be applied to an integration project. The intent of the profiles is to:

- a) provide context on the semantical content of transactions and messages between two or more applications.
- b) allow software vendors to use the information in the master data profile to interact with other systems that have implemented the same master data profile.
- c) provide the basis for a technical implementation of master data profiles, using a machine-readable language such as XML and JSON.

Master data profiles could be generated within a company for specific projects, across companies in a supply chain, or within an industry segment. Business situations can change, thus requiring master data profiles to be revised or replaced. Therefore, it is necessary to implement mechanisms that allow for extending or revising master profiles.

A master data profile defines the restrictions on the content of the master data information that could be sent by an application, and places restrictions on the content of master data information that will be accepted by an application.

A master data profile specification is one of the results of an analysis and design process to integrate systems. Development of master data profiles enables the interoperability of applications from multiple vendors.

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1 Scope

This technical report describes a template for exchange of ISA-95 master data. Master data profiles are used to describe the semantical rules that an application, involved in integration using ISA-95 defined objects and transactions, will accept and/or will generate. The goal is to reduce the risk, cost, and errors associated with implementing integration.

2 References

The following documents are referred to in this technical report. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ANSI/ISA-95.00.01-2010 (IEC 62264-1 Mod), *Enterprise-Control System Integration – Part 1: Models and Terminology*

ANSI/ISA-95.00.02-2010 (IEC 62264-2 Mod), *Enterprise-Control System Integration – Part 2: Object Model Attributes*

ANSI/ISA-95.00.03-2013 (IEC 62264-3 Mod), *Enterprise-Control System Integration – Part 3: Activity Models of Manufacturing Operations Management*

ANSI/ISA-95.00.04-2012, *Enterprise-Control System Integration – Part 4: Objects and Attributes for Manufacturing Operations Management Integration*

ANSI/ISA-95.00.05-2013, *Enterprise-Control System Integration – Part 5: Business-to-Manufacturing Transactions*

ANSI/ISA-95.00.06-2014, *Enterprise-Control System Integration – Part 6: Messaging Service Model*

ANSI/ISA-95.00.07-2016, *Enterprise-Control System Integration – Part 7: Alias Service Model*

MESA International, B2MML Specifications, <http://www.mesa.org/en/B2MML.asp>

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: <http://www.electropedia.org/>
- ISO online browsing platform: <http://www.iso.org/obp>

4 Master data profile overview

4.1 Profile as specification of semantical rules

A profile defines the semantical rules to be applied to information exchanged between applications and systems. The syntactical rules are defined by the implementations of the ISA-95 information exchange standards, such as those specified in XML, JSON, SQL, or other technologies. These implementations specify the structure of the data. A master data profile specifies the identifiers, enumerations, and other information that make up valid values for exchanged information.

NOTE The term *semantics* refers to the meaning of information rather than the form of the information (syntax).

4.2 Profile template and profile use

The master data profile template defines the structure for creating a specific master data profile. Profiles could be generated within a company for specific projects, across companies in a supply chain, or within an industry segment. A master data profile defines the restrictions on the content of the information that could be sent by an application, and places restrictions on the content of information that will be accepted by an application. Figure 1 illustrates the use of a master data profile template.

- a) The master data profile template is used to create a master data profile in a technology implementation, such as XML or JSON.
- b) The master data profile is made available in applications.
- c) The applications update their internal data stores with the information (such as process segment IDs) specified in the profile.
- d) When messages are sent, they use the IDs defined in the profile, such as the process segment ID defined in the profile.
- e) The receiving application understands the context of the exchanged information, such as knowing how to process messages referencing process segments “A” and “B.”

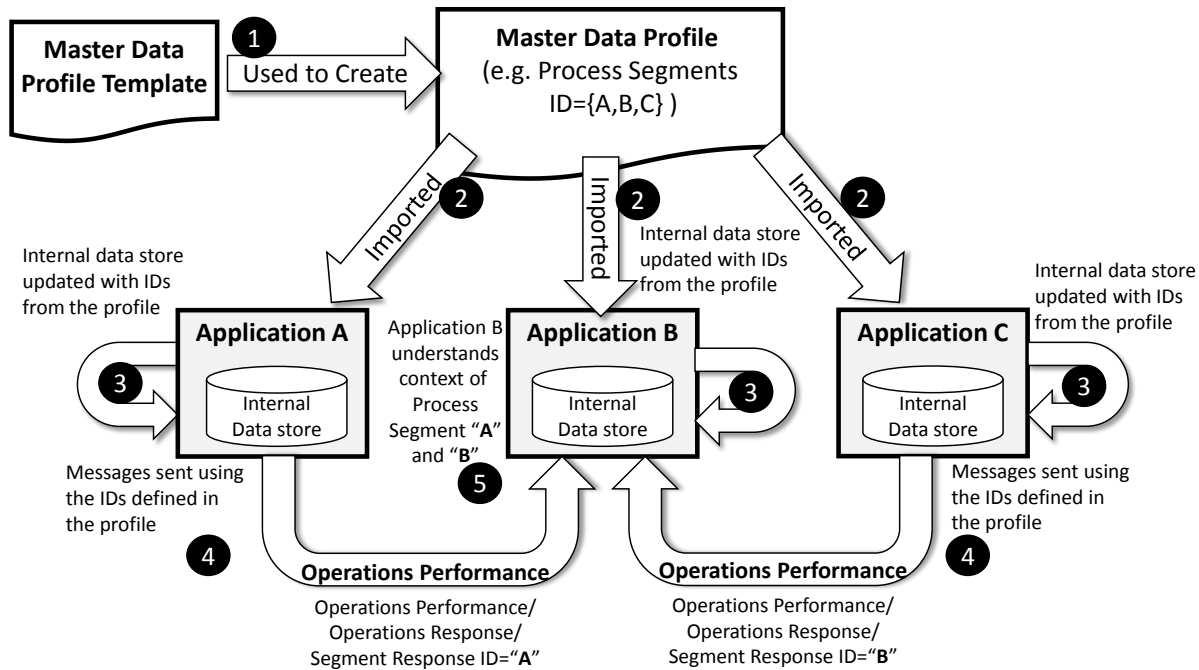


Figure 1 – Example of profile template and profile use

4.3 Use of a profile in applications

Applications using a master data profile may not handle all of the information defined in the profile.

EXAMPLE 1 If an application does not maintain information about materials, then it would ignore information in the profile dealing with material classes and material definitions.

EXAMPLE 2 If an application does not handle operational locations, then it would ignore information in the profile dealing with operational locations.

A master data profile may include information that is not directly used by an application but is intended for assistance in the configuration of the application. Because not all information required for correct operation of the application may be available from the master data profile, there may be an engineering effort to complete the application configuration.

EXAMPLE 3 An application may need to have special handling rules entered for specific types of hazardous materials (material classes, or material definitions with specific properties). The handling rules would be manually configured for the class of material defined as hazardous, a different class of materials that need to be locked up due to regulations, and a third class of materials that are handled as line-side allocated materials, as shown in Figure 2.