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Enterprise-Control System Integration − Part 5: Business-to-Manufacturing Transactions

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FOREWORD

ISA-95 is a multi-part series of standards that define enterprise-to-control system integration. This Part 5 standard defines the transactions to interface business and manufacturing activities per the following:

- Clause 4 is normative. It describes the transaction models and messages used.
- Clause 5 is normative. It describes the verbs used in the messages.
- Clause 6 is normative. It defines the message nouns, the structure of the nouns, the verbs used with the nouns, and the rules for the verbs.
- Clause 7 is normative. It describes the requirements for declarations about completeness, compliance and conformance to the standard.
- Annex A is normative. It defines the message nouns, the structure of the nouns, the verbs used with the nouns, and the rules for the verbs for production specific information
- Annex B is informative. It contains examples of sequences of transactions used to coordinate selected business activities.
- Annex C is informative. It contains a series of questions and answers regarding the use of the standard.
- Annex D is informative. It contains references to documents used in the generation of this standard
- Annex E is informative. It defines the pattern for verbs.
- Annex F is informative. It defines the general rules used for identifying nouns from object models.

As currently envisioned, ANSI/ISA-95 consists of the following standards under the general title Enterprise-Control System Integration:

- Part 1: Models and terminology

- Part 2: Objects and attributes for enterprise-control system integration

- Part 3: Models of manufacturing operations management

- Part 4: Object models and attributes of manufacturing operations management

- Part 5: Business-to-manufacturing transactions

- Part 6: Messaging service model (development begun in 2013)

INTRODUCTION

This ISA-95 Part 5 standard is based on the use of ISA-95 abstract models defined in ISA-95 Part 2 and Part 4, combined with OAGi verbs to define a transaction model for information exchange. It is recognized that other non ISA-95 Part 5 transaction protocols are possible and are not deemed invalid as a result of this standard. Transactions occur at all levels within the enterprise and between enterprise partners, and are related to both required and actual activities, but the focus of this Part 5 is the interface between enterprise/business systems and manufacturing systems. This Part 5 defines business-to-manufacturing transactions and manufacturing-to-business transactions that may be used in relation to the objects that are exchanged between Level 4 and Level 3, and within Level 3, as defined in the object models of ISA-95 Part 2 and Part 4. Models are introduced that provide descriptions of the transactions and explanations of the required transaction processing behavior. Technology-specific implementations to provide this behavior are not defined in this Part 5 standard. This Part 5 standard has the intent of providing insight into the level of work required to construct transactional exchanges.

Edition 3 of this Part 5 standard includes the definition of transactions for object models defined in ISA-95 Part 4.

ENTERPRISE-CONTROL SYSTEM INTEGRATION

Part 5: Business to Manufacturing Transactions

1. Scope

This ISA-95 Part 5 standard defines transactions in terms of information exchanges between applications performing business and manufacturing activities between Levels 3 and 4, and within Level 3. The exchanges are intended to enable information collection, retrieval, transfer and storage in support of enterprise-control system integration. This Part 5 is consistent with the ISA-95 Part 2 and Part 4 object models. This Part 5 also defines transactions that specify how to exchange the objects defined in Part 2, Part 4, and this Part 5. Other uses of the transaction model are not defined in this Part 5 standard.

The models covered in this standard are: Personnel Model, Equipment Model, Physical Asset Model, Material Model, Process Segment Model, Operations Capability Model, Operations Definition Model, Operations Schedule Model, Operations Performance Model, Resource Relationship Network Model, Work Capability Model, Work Definition Model, Work Schedule Model, Job List Model, Work Performance Model, Workflow Specification Model, and Work Alert Model.

2. Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this ISA-95 Part 5 standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid normative documents.

ISO/IEC 19501-1 Information Technology – Unified Modeling Language (UML)—Part 1: Specification

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

3. Definitions and abbreviations

3.1 Terms and definitions

3.1.1
application
an ordered set of physical and logical system processes, performed by a set of resources that conduct a set of transactions intended to accomplish a definite objective; information provider or information user performing the activity that is involved in a transaction