TECHNICAL REPORT

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Framework for energy market communications –

Part 101: General guidelines

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 101: General guidelines

FOREWORD

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The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC 62325-101, which is a technical report, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The IEC 62325 series cancels and replaces IEC 62195 (2000) and its amendment (2002). It constitutes a technical revision.

IEC 62195 (2000) dealt with deregulated energy market communications at an early stage. Its amendment 1 (2002) points out important technological advancements which make it possible to use modern internet technologies based on XML for e-business in energy markets as an alternative to traditional EDI with EDIFACT and X12. The new IEC 62325 framework series for energy market communications currently consisting of IEC 62325-101, IEC 62325-102, IEC 62325-501, and IEC 62325-502 follows this direction and replaces IEC 62195 together with its amendment.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
57/704/DTR	57/721/RVC

Full information on the voting for the approval of this technical report 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.

IEC 62325 consists of the following parts, under the general title *Framework for energy market communications*:

Part 101: General guidelines

Part 102: Energy market model example

Part 201: Glossary [1]

Part 3XX: (Titles are still to be determined) [2]

Part 401: Abstract service model [3]

Part 501: General guidelines for use of ebXML

Part 502: Profile of ebXML

Part 503: Abstract service mapping to ebXML [3]

Part 601: General guidelines for use of web services [3]

Part 602: Profile of Web Services [3]

Part 603: Abstract service mapping to web services [3]

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site 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.

A bilingual edition of this document may be issued at a later date.

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1 Under consideration. Because the technologies have an inherent own glossary within their standard definitions, this glossary is a placeholder for a glossary for future parts indicated with [2)] including energy market specific terms and definitions.

2 Under consideration. These parts for business content are mentioned for completeness only with a number space as placeholder. They extend the original scope and require an agreed new work item proposal for further work based on an overall strategy how to proceed.

3 Under consideration. These technical parts are mentioned for completeness with provisional title. They extend the original scope and require an agreed new work item proposal for further work.

INTRODUCTION

With the transition of monopoly energy supply structures to deregulated energy markets, the function of the markets depends heavily on seamless e-business communication between market participants. Compared with global e-business, e-business in the energy market is only a small niche. Today, UN/EDIFACT or ANSI ASC X12 messages, or proprietary HTML and XML solutions based on Internet technologies are being used. With the advent of new e-business technologies such as ebXML by UN/CEFACT (United Nations / Centre for Trade and Electronic Business) together with OASIS (Organization for the Advancement of Structured Information Standards), and Web Services by W3C (World Wide Web Consortium) and OASIS based on Internet technologies, an energy market specific profile of these standards can be used for regional energy markets. These profiles allow the re-use of proven core components and communication platforms across markets, thus saving cost and implementation time. Because some of these technologies are still under development, other technologies or converged technologies are not excluded for the future.

The IEC 62325 series includes, besides general requirements and guidelines, the business operational view with profiles of technical e-business communication architectures together with migration scenarios. The process and information model as well the abstract service model is not included in the first edition of the IEC 62325 series but may be added in the future. It does not itself define standards and only references available standards.

It supports the communication aspects of all e-business applications in deregulated energy markets with emphasis on system operators. The business operational view includes the market communication aspects of system operator applications with interfaces to other market participants from trading over supply to balancing planned generation and consumption, change of supplier, market services and billing.

The ‘process’ real-time communication of energy systems is beyond the scope of the IEC 62325 series.

The IEC 62325 series is subject to legal and security aspects of e-business and energy market rules that may be different from country to country or region to region.

It is important to note that the IEC 62325 series specifies no “content” (market model with processes, collaborations, transactions, messages, core components) because energy markets still vary. The specific content modelling of regional markets is subject of regional projects and/or may be candidate for future standardisation extending the IEC 62325 series. But methods and tools of modelling are described and in part 102 non-normative examples of core models, processes and messages, which show how the IEC 62325 series might be used.

Note that work is in progress at UN/CEFACT regarding the “content” of business information exchange for example as Core Components (UN/CEFACT – Core Components Technical Specification), Core Component Library (CCL, accessible through an registry/repository), Catalogue of Core Components (including industry groups), Common Business Processes, UMM Business Library, XML message design rules (UN/CEFACT – XML Naming and Design Rules (Draft 2004)).

The energy market specific vocabulary can be derived from Core Components or/and a knowledge based energy market information model (for example the so called CIM market extension of the CIM Common Information Model (IEC 61970-301)).

Whereas IEC 62325-501 and IEC 62325-502 of the current IEC 62325 series edition are restricted to the use of the ebXML technology, the planned technical parts are intended to convert the framework into a more open framework taking into account also other e-business technologies besides ebXML, as Web Services with future IEC 62325-6XX. This may also include with future IEC 62325-401 an abstraction service model with mapping to the various e-business technologies (future IEC 62325-503, and future IEC 62325-603) to hide the e-business technology actually used from the application.

It is important to note that the definition of a full and detailed energy market model is beyond the scope of the IEC 62325 series, because energy markets are different. But what might be included in future with the future IEC 62325-3XX is an extensible and adaptable core set of information model definitions in UML which can be used as an vocabulary for the interface of utilities to the market together with XML schema design rules for the mapping from UML to XML, and market identification schemas. This would enable and support, but not restrict, parties of the energy market to define complete energy market models in detail.

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 101: General guidelines

1 Scope

This part of IEC 62325 gives *technology independent* general guidelines applicable for e-business in energy markets based on Internet technologies providing:

- a description of the energy market specific environment;
- a description of the energy market specify requirements for e-business;
- an example of the energy market structure;
- an introduction to the modelling methodology;
- network configuration examples;
- a general assessment of communication security.

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.

2.1 Generic Open-edi standards

The IEC 62325 series is based on ISO/IEC 14662 and Internet technologies, notably on XML (Extensible Markup Language) of the W3C (Word Wide Web Consortium) with references to existing or emerging standards or de-facto standards for global e-business.

IEC 60870-6 (all parts), *Telecontrol equipment and systems – Part 6: Telecontrol protocols compatible with ISO standards and ITU-T recommendations*

IEC 61968 (all parts), *Application integration at electric utilities – System interfaces for distribution management*

IEC 61970 (all parts), *Energy management system application program interface (EMS-API)*

IEC 62210, *Power system control and associated communications – Data and communication security*

ISO/IEC 14662, *Information technology – Open-edi reference model*

ANSI ASC X12, Release 4040, December 2000

UN/EDIFACT, D.01A Directory, January 2001

UN/CEFACT *Modelling Methodology (UMM)*, NO90 R12 or higher

UN/CEFACT *Meta Model*, NO90 R10 or higher

UN/CEFACT *XML Naming and Design Rules*, draft 2004[4]

UN/CEFACT Core Components Technical Specification

In this part of IEC 62325, RFCs (Request For Comments) from the Internet Engineering Task Force (IETF) and recommendations from other Organisations such as the Word Wide Web Consortium (W3C) and the Organization for the Advancement of Structured Information Standards (OASIS) are mentioned which are not included here because these documents are referred to in the references above.

2.2 Sectorial Open-edi standards

Market modelling based on this implies to some extent sectorial standards. At the moment no references are given.

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4 Under consideration.