

TECHNICAL REPORT

IEC 62195

2000

AMENDMENT 1
2002-04

Amendment 1

**Power system control and
associated communications –
Deregulated energy market
communications**

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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FOREWORD

This amendment has been prepared by IEC technical committee 57: Power system control and associated communications.

The text of this amendment is based on the following documents:

Enquiry draft	Report on voting
57/556/Q	57/576/RQ, 57/576A/RQ

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until 2003. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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0.1 Reference documents

Add the following reference to the list:

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

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Add the following new annex E:

Annex E

Use of Internet technologies

E.1 Technological advancement

The report gives an overview of market models at the time of writing and possible communication platforms based on UN/EDIFACT messages or Internet technologies as HTML over HTTP. Whereas EDIFACT messages were widely used (e.g. in the Ediel System of Scandinavia and now also in some other European countries and elsewhere), the Internet approach at the time of writing had the drawback that no standardized messages in HTML were available leading to proprietary solutions. Also security of the Internet was an issue.

In the meantime the Internet Language Definition Standard XML (eXtensible Markup Language) was defined by W3C as a subset of SGML (Standard Generalised Markup Language). With XML applications can share data using a Schema as DTD (Document Type Definition) or XSD (XML Schema Definition) which defines the grammar. One of the outstanding features of XML is that data can be given a name tag which makes it easier to map data to data bases. Whereas the main purpose of XML is data transmission between applications and data bases the content can also easily be visualized with an Internet Browser using CSS (Cascaded Style Sheets) or XSLT (Extensible Stylesheet Language for Transformation) together with CSS.

UN/EDIFACT and XML are not competing solutions and can be combined in what is now called “Web-EDI”. Already regional new initiatives are taken to define their own XML/EDI solutions. Many XML architectures have been proposed, so far none of these is a global Standard and they compete against each other. The most promising architecture seems to be ebXML (electronic business XML) supported by UN/CEFACT (The United Nations Centre for Trade and Electronic Business) which is intended to become an International Standard. This architecture can be combined with EDIFACT messages mapped to XML. The mapping is already done by CommerceNet, XML/EDI Group and ANSI ASC X12 Working Group and will be soon available in the Internet. Alternatively, the content of EDIFACT messages is re-engineered using so called core components from a future and hopefully standardized global e-business XML vocabulary under the auspices of UN/CEFACT.

Business processes can be modelled with the meta language UML (Unified Modeling Language of Open Management Group (OMG)). Figure E.1 shows the modelling with UML and the production of XML Schemas with the XMI (XML Meta Interchange) of OMG.

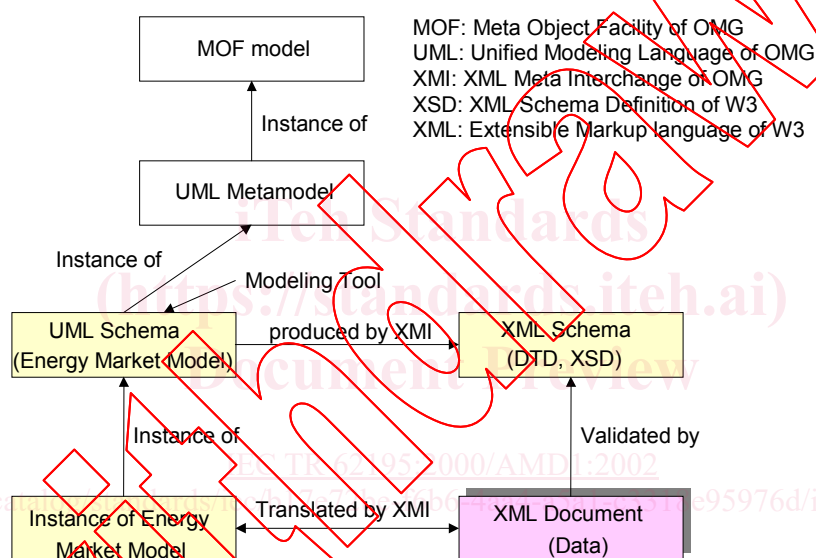


Figure E.1 – UML-Modelling and XML Schema

Electronic business with XML-messages is estimated to have the potential to become a big global market within the next couple of years if a single global International Standard can be successfully implemented. Given the potential of XML it will be wise to base the communication of electricity markets on the coming XML Standard Architecture of UN/CEFACT. This allows vendors to offer products across different markets with lower cost. Using general used platforms has also advantages regarding implementation, test and future development. In the meantime, besides EDIFACT, also non-standard XML solutions are possible which may migrate in the future to the Standard Architecture.

E.2 Generic e-business architecture

The technical Standard Architecture of e-business based on XML should follow the “Open-edi reference model” (ISO/IEC 14662) and the e-business semantic of the UN/CEFACT UMM (Unified Modeling Methodology), Document N090, where applicable. The content and structure of existing EDIFACT messages already used for the electricity market should be taken into account. Whereas EDIFACT is more intended for large business, the future XML communication architecture should be scalable and also affordable for small business.

Figure E.2 below shows the Open-edi environment according to ISO/IEC 14662.

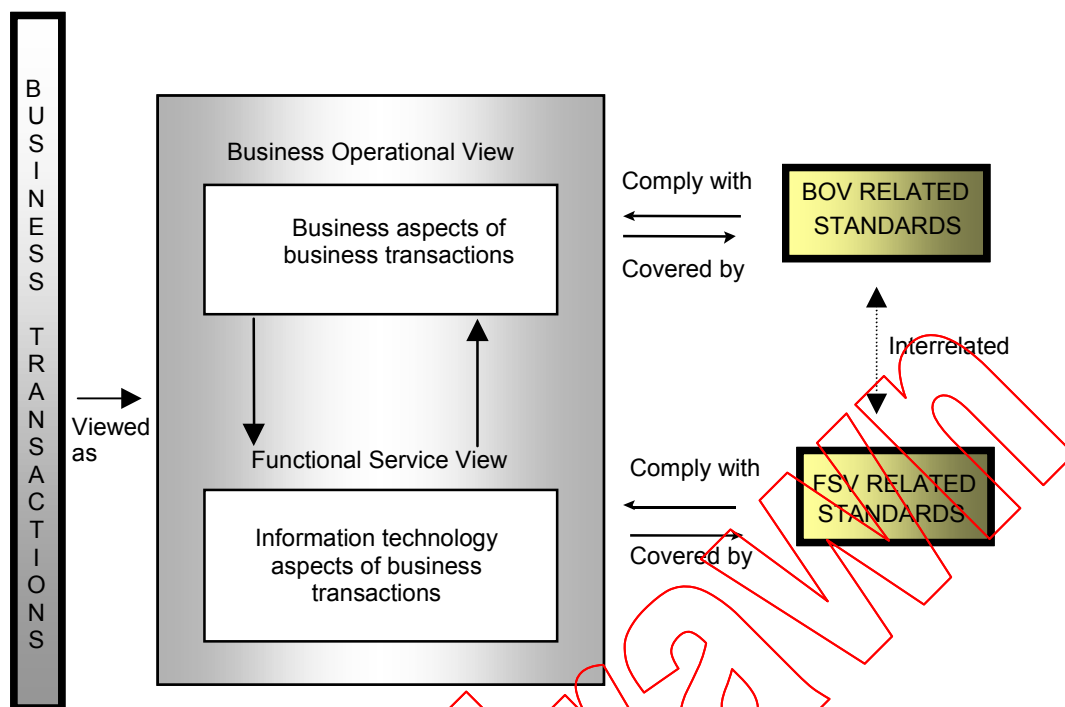


Figure E.2 – Open-edi environment

Fundamental to standardization is the notion of *generic* Open-edi standards: Business Operational View (BOV) languages, tools and methods, Functional Service View (FSV) used by all industries and sectors and *sectorial* Open-edi standards (BOV Open-edi models with contents and processes of the business transactions) to facilitate the re-use of Open-edi components. The same is true for the de-coupling of BOV and FSV to allow the use of the same BOV above evolving new or other FSV related technologies.

Presupposition for e-business and transactions in deregulated electricity markets are harmonized *market rules* that may span a country or even a whole region consisting of many countries. An incomplete list may include the legal and regulatory framework, legal and security aspects of e-business, technical market rules (network access, balance management, schedule management, congestion management), identification schema of market participants and e-business objects, metering rules (service and access to metering values), grid rules (operation), distribution rules (operation), load profiles (synthetic and analytical). The model has to comply with these rules and must include all market participants and transactions to allow seamless communication. The BOV includes all applications from trading over supply to balancing generation and consumption and billing. Congestion management and ancillary services are closely related to the process but may use at least the same FSV platforms.

Because market rules of regions may differ from each other also the BOVs may be different but may also include generic models and messages.

The e-business standard framework ebXML that can be used for electricity markets is more than just an exchange format for data and may include (references B.N.N to the Open-edi reference model are given in brackets):

- a) a standard mechanism for describing a *Business Process* and its associated information model (B.2.2);
- b) a mechanism for registering and storing *Business Process and Information Meta Models* so they can be shared and reused (B.2.3);
- c) discovery of information about each participant including:
 - the *Business Processes* they support,
 - the *Business Service Interfaces* they offer in support of the *Business Process*,