

XML for Retail Energy Transactions: A White Paper



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XML FOR RETAIL ENERGY TRANSACTIONS

Introduction

XML for Retail Energy Transactions introduces a framework of standardized business-to-business (B2B) electronic transactions using eXtensible Markup Language (XML) in the deregulated retail energy industry. This Paper articulates the evolution of energy deregulation, the introduction of the Internet and e-Commerce and ultimately, the significance and functions of XML.

It is believed that the widespread use of XML for standardized business transactions will improve the competitive landscape of the deregulated retail energy industry. Retail energy transactions among trading partners are complex, data-intensive communications that are costly to establish and maintain. The use of XML based electronic business transaction standards for the deregulated energy industry lowers the barrier to entry of Energy Service Providers (ESPs) by providing a cost efficient, reliable and “open” means of communication with Local Distribution Companies (LDCs).

Primer on Deregulation

The primary impetus for energy deregulation was to lower energy costs to consumers. To maximize profitability while lowering consumer costs, ESPs and LDCs need to develop new technologies and improve business processes. Historical evidence from other industries supports the theory that competition stimulates creativity and new technologies.

As an example, in the airline industry, American Airlines developed the Sabre™ airline reservation system. Combined with sophisticated pricing models, the Sabre information technology has allowed airlines to improve the load factor, the percentage of seats filled on a given flight, from less than 50% in 1970 to almost 70% in 1997.

	% Real Price Reduction after 10 years	Annual Value of Consumer Benefits
Long Distance Telecom	40-47%	\$5 billion
Airlines	29%	\$19 billion
Trucking	28-58%	\$19 billion
Railroads	44%	\$9 billion

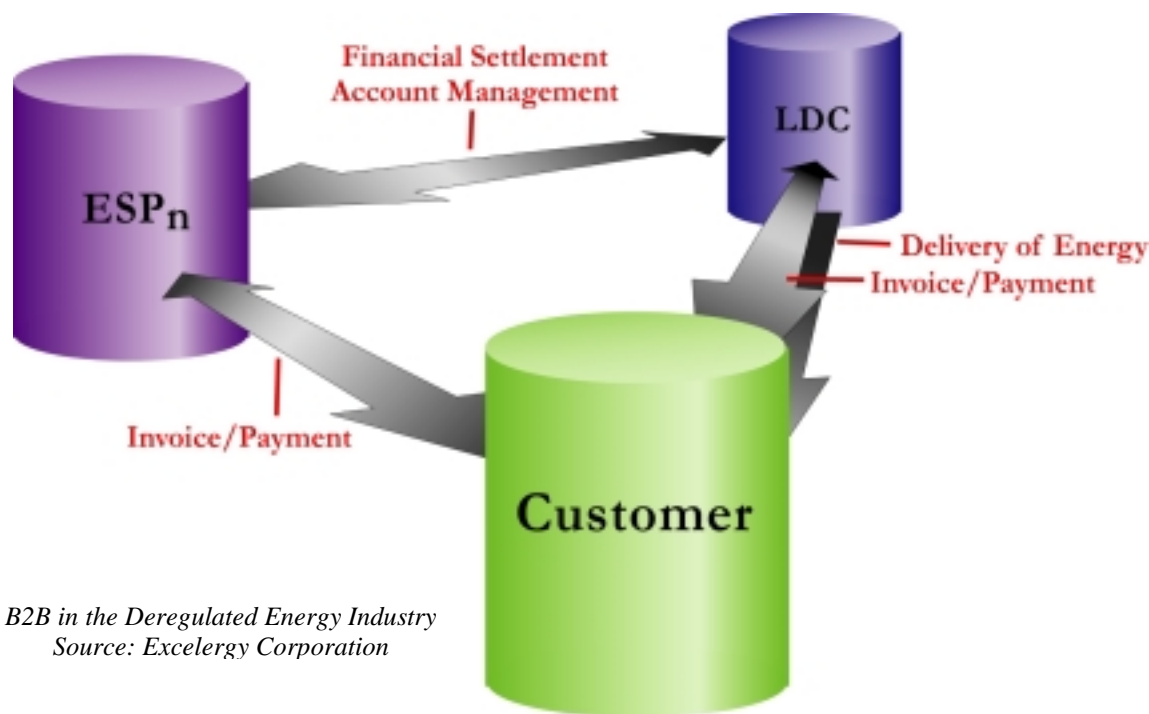
Source: *Economic Deregulation and Customer Choice: Lessons for the Electric Industry*, Crandall and Ellig, 1997.

Another example of competition yielding new technology and related benefits is in the banking industry. Automated Teller Machines (ATMs) have reduced the need for many retail branches, thus lowering costs while improving service through twenty-four hour access. In the telecommunications industry, digital technology and fiber optics have dramatically increased capacity and lowered unit costs, allowing significant real price declines in long distance telecommunications services. U.S. Department of Energy studies estimate that competition within the energy industry could lead to real price declines of between 19% and 43%.

B2B within the Deregulated Energy Industry

The energy industry is deregulating at both the wholesale and retail levels. At the wholesale level, competition exists among energy suppliers and financial intermediaries. At the retail level, deregulation has encouraged competition among ESPs, the entities that sell the energy commodity to end-users.

The deregulation of the retail energy market has created complex trading relationships among the ESPs and the LDCs. Deregulation has broken up the monopoly into discrete entities forming a triangular relationship, which requires the transfer of customer information among the participants. Previously, the energy industry was a vertically integrated monopoly that required little external sharing of customer information. The development and use of both uniform business practices and standard electronic business transactions will facilitate the sharing of information aiding the development of a robust retail market. The primary focus of this analysis is how XML may speed the adoption and utilization of standard electronic business transactions.



Impediments to Efficient B2B within the Deregulated Energy Industry

The existing industry computer systems are based on older legacy technology. These systems were never designed to support the information exchanges now being required by deregulation. Therefore, a substantial challenge in implementing deregulation involves modifying pre-existing information systems and business processes to facilitate retail B2B energy transactions. LDCs in particular must operate within the constraints imposed by legacy systems and specific jurisdictional requirements set by state regulatory bodies.

Today, the primary method for exchanging retail transaction information is electronic data interchange, or EDI. The Utility Industry Group (UIG) developed EDI standards specifically for the electric industry. However, the range of options available to market participants when implementing EDI standards results in multiple flavors and complexities. For example, the “814” information has ten flavors within itself and ten additional variations within a certain state. Each LDC chooses the flavor that simplifies its own legacy system interaction with the new competitive business environment.

A New York Public Service Commission study cites four different LDC-specific methods for customer account number authentication in NY State.

1. Account number + check digit (Consolidated Edison, Niagara Mohawk, Orange & Rockland, and National Fuel Gas)
2. Account number, check digit + meter number (Central Hudson, New York State Electric & Gas)
3. Account number, check digit, + service address (KeySpan Energy/Brooklyn Union)
4. Energy Marketer account number + delivery point number (Rochester Gas & Electric)

Source: “Report of the New York EDI Collaborative” Electronic Data Interchange Proceeding, Case 98-M-0667, June 30, 1999.

The number of unique translation maps grows dramatically as an ESP adds additional LDCs in new geographic regions.

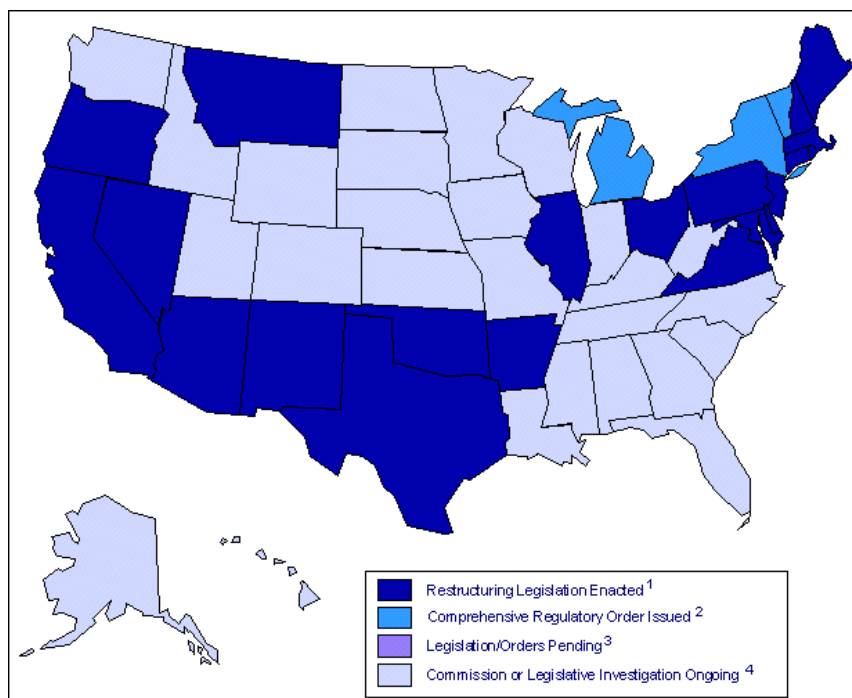
Doug Houseman, Director at Cap Gemini Hagler Bailly recently estimated the cost of implementing EDI within deregulated markets:

“Houseman estimates a retailer or energy service provider wanting to do business in a particular state must spend \$500,000 to comply with the region’s EDI Standards before selling the first megawatt. In addition, the company will have to spend another \$50,000 per utility in the region to meet varying EDI standards.”

Source: “The EDI Solution: Help or Hindrance in Billing and Metering” by Richard Stavros, Public Utility Fortnightly, p.53, October 1, 1999.

As illustrated in the Chart below, energy deregulation is proceeding on a state-by-state basis. Twenty-one states have enacted restructuring legislation opening electric markets. Virtually every state has considered or is considering restructuring its electric and gas markets in one form or another.

Status of State Electric Industry Restructuring Activity as of October 1, 1999



Source: Energy Information Administration

Given the pace of deregulation, the costs are significant for an ESP entering multiple states with varying standards. In addition to increased costs, management of EDI's complexity diverts resources from other internal activities. This highlights the fundamental business problem, which is increased transaction costs for all participants within the industry.

Unlocking the Power of the Internet

The Internet is driving profound changes across all facets of society. The ability to integrate computer systems through an open standard with lower costs is particularly attractive to the business community. Companies within specific industries, such as the chemical industry, are migrating B2B transactions from proprietary networks to the open platform of the Internet.

The growth of the Internet, with over seven million registered Internet server sites world wide and the surge of companies deploying e-Commerce business Web sites are providing new electronic commerce models. The ability to combine Web based front-end processes with back-end information systems is what distinguishes e-Business from simple e-Commerce.

The migration of B2B to the Web, one must understand how the Internet is evolving to accommodate these new demands placed on it. Traditionally Internet integration has used Web forms (based on HTML) for e-Commerce systems in business-to-consumer (B2C) commerce. Now with B2B systems migrating to the Internet, HyperText Markup Language (HTML) syntax does not provide the means to represent these interchanges effectively.

XML – The Next Generation Vehicle for B2B

The XML specification (see sidebar below) was officially ratified by the World Wide Web Consortium (W3C) in February 1998 as an extension of the capabilities of HTML and Standard General Markup Language (SGML). As a close cousin of HTML syntax, software developers can quickly assimilate XML. XML contains significant design features to keep it simple and consistent and avoid the incompatibilities and complexities found in HTML. Also, XML is subject to an official International Standards Organization (ISO) standard. Support of ISO standards is essential to an EDI style use of XML, ensuring simple and consistent behavior across a broad range of systems and trading partners.

The implications of XML based B2B commerce are profound. XML enjoys the advantages of its heritage as an Internet-centric protocol. XML is easily viewable by people via applications such as desktop browsers. XML also leverages existing Internet HyperText Transfer Protocol (HTTP) based communications and security infrastructure. Moreover, XML-based communications support real-time application-to-application and Web-to-application document flow and integration. In short, XML leverages existing Internet investments.

XML allows developers to separate the presentation layer (forms) from the data interchange layer (information). XML is specifically targeted to support forms and document based interchanges via the Internet by defining the metadata details. XML's structure facilitates deployment architectures that improve Internet delivery performance, and better information manipulation via the Web over HTML. These techniques allow developers to better handle unstructured information interchanges, as well as providing the means to represent traditional fixed structured (EDI type) data interchanges.

XML provides the following benefits as a vehicle for B2B within retail energy:

- XML creates a richer structural and semantic environment to express the many roles and relationships among LDCs and ESPs.
- XML's extensibility is key to fulfilling its promise of simplified standards. Ease of parsing and validation help developers quickly adapt to changes in the industry.

- XML is designed for use on the Internet. The Internet itself provides opportunities for companies to minimize their costs by reducing their dependence on traditional Value Added Networks (VANs).
- XML has a wide acceptance across a growing number of industries, leading to a corresponding depth of tools, processes, and knowledge about XML.
- XML is designed to be readable by people and easily parsed by computers. Both of these design decisions help reduce development and quality assurance costs.
- XML's ease of development helps small and medium-size companies remain flexible while interacting with a wide range of trading partners.

The early stage of energy deregulation offers an opportunity to go beyond EDI and define energy e-Business with XML.

SIDEBAR: XML at a glance.

XML is a content markup format that is a close cousin of familiar Web HTML. XML documents contain elements that consist of start tags "<", and end tags ">", with the data content between the two tags. With XML you can define your own tags; unlike HTML where there is only a limited set of allowed tags.

PIPE 2.0a

Document:

```
<MeterInformation>
  <MeterNumber>F33729254</MeterNumber>
  <ProfileGroup>14</ProfileGroup>
  <DistributorRateCode>RES</DistributorRateCode>
  <DistributorRateSubclassCode>RES</DistributorRateSubclassCode>
  <SupplierRateCode>15</SupplierRateCode>
  <DistributorMeterCycle>15</DistributorMeterCycle>
  <MeterType>KHMON</MeterType>
  <MeterMultiplier>1</MeterMultiplier>
  <NumberOfDials>1</NumberOfDials>
  <MeteringSignificanceForBilling>1</MeteringSignificanceForBilling>
</MeterInformation>
```

Valid XML messages reference a Document Type Definition (DTD). DTDs list elements and attributes and how they interact with one another. The DTD details valid message content and structure similar to an EDI transaction specification.

DTD:

```
<!ELEMENT MeterInformation (MeterNumber, OldMeterNumber?,
ProfileGroup?, DistributorRateCode, DistributorRateSubclassCode?,
SupplierRateCode?, DistributorMeterCycle, MeterType+,
MeterMultiplier?, NumberOfDials?, MeteringSignificanceForBilling*)>
```

Is XML Ready for Prime Time?

Implementing XML offers an evolutionary model for transition from static EDI mechanisms. XML adds three things to traditional EDI mechanisms to make EDI more dynamic. First, XML adds the ability to define message structures with the interchange transaction (XML linked to Document Type Definition (DTD) formats). Second, it adds the ability to model the business rules and interchange requirements (extended XML based process templates). Finally, XML adds the ability to use software technologies (HTML forms and business application components) driven from the XML formats themselves that are therefore self-adaptive and maintaining.

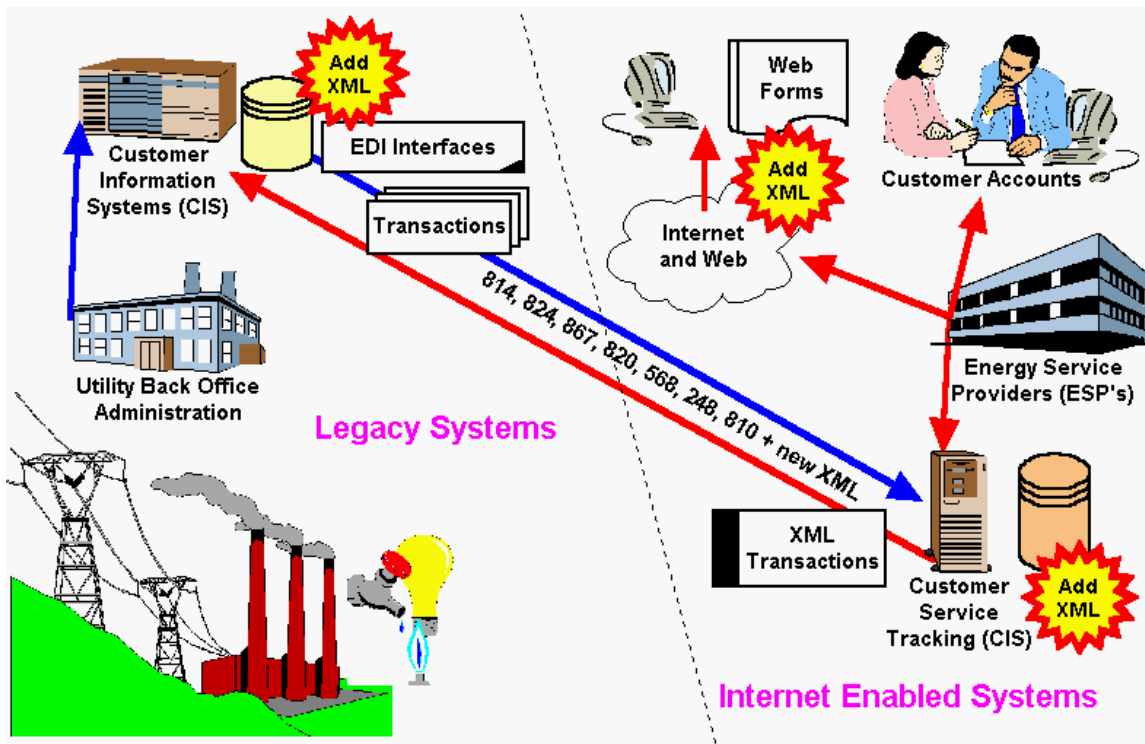
Various entities are working to combine traditional EDI with XML to create XML based syntaxes for horizontal (cross industry) use of XML. These include EDI standards bodies (DISA/X12, CEFAC, STEP and EDIFACT), industry associations (FIX, EDIX, MBA, OTA, HL7), and trade consortiums (BizTalk, OASIS, RosettaNet, CommerceNet, OFI, OTP, ICE). The W3C as a whole is working on extending and improving XML to meet the challenges of deploying interoperable e-Business systems.

The major software tool vendors have committed to and have shipped products with XML capabilities. Microsoft is investing heavily in XML technologies. An example is their new BizTalk product suite designed to provide the middleware for Internet based interchanges. Microsoft is also including XML into their Office Suite of products to provide desktop integration. Oracle Corporation introduced XML processing capabilities into their Oracle 8i database systems.

The XML standards community is encouraging industry specific groups to develop XML vocabulary appropriate for industry specific B2B requirements. With the publication of this White Paper, Excelergy makes its contribution to the implementation of XML for the deregulated energy industry.

XML within the Deregulated Energy Industry

The diagram below highlights an efficient, Web-based deregulated energy information structure powered by XML. Customer information, such as enrollment and switching may be collected via the Internet. ESPs, LDCs and related Service Providers may exchange customer, usage, billing and payment information via the Internet or Value Added Networks (VAN). Legacy system applications process electronic business transactions translated by either EDI translators or XML parsers. Under this deployment scenario, neither ESPs nor LDCs are forced into adoption of expensive, proprietary systems. ESPs and LDCs may leverage existing investments in both Internet and EDI based technologies.



XML Enabled B2B Commerce for the Deregulated Energy Industry
Source: Excelergy Corporation

Excelergy Releases Open Standards - PIPE™

Excelergy releases an open, public use library for deregulated energy transactions called PIPE™ (Partner Interface Processes for Energy). The library contains an XML standard for several transactions currently used to enroll energy customers with ESPs. The XML standards contained in PIPE closely resemble the EDI 4010 transaction sets created by the UIG.

What is PIPE?

PIPE is an XML based messaging protocol for the exchange of transactions among retail energy industry trading partners. PIPE provides a real-time, Internet Protocol (IP)-centric and extensible environment for integrated, interoperable information exchange.

PIPE defines the format, content and method of the transaction exchange, along with the roles and responsibilities of the trading partners involved in that exchange. PIPE also provides support for managing and tracking the exchange.

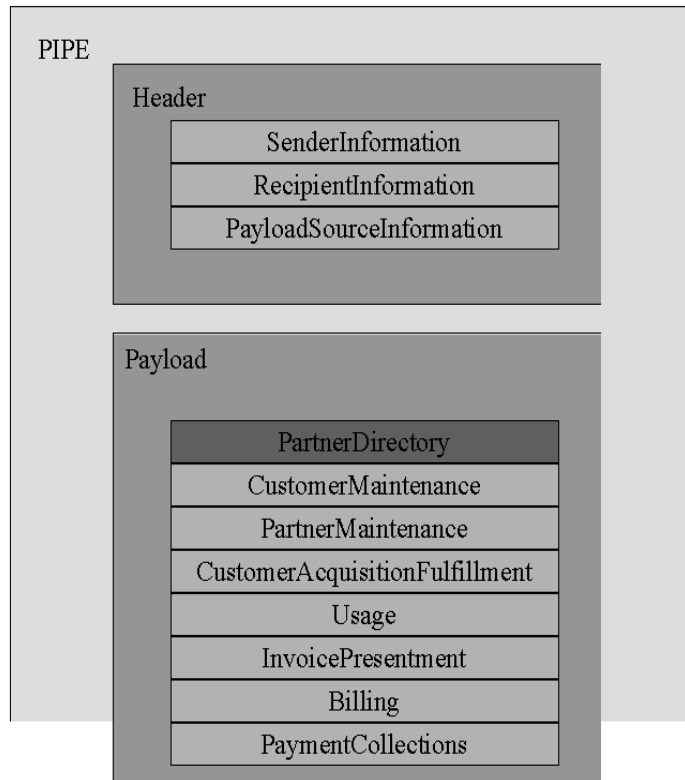
This is the first release that will form the foundation for a set of XML standards for the retail energy industry. This first release focuses on customer maintenance activities such as generation service requests. While many of the activities here relate to the UIG-EDI 814 standard for customer information and enrollment, subsequent releases will include activities not explicitly covered by EDI standards such as Partner Maintenance, Customer Acquisition and Fulfillment, and Invoice Presentment.

PIPE Overview

PIPE is both a messaging protocol and a message format. It facilitates the exchange of transactions over the Internet and defines the content and structure of the transaction. The messaging protocol is basic and easily implemented in almost any networked environment. The message format is partitioned to allow subject areas to be implemented independently. In both cases the use of XML makes implementation easier and includes validation of messages and data.

The PIPE messaging protocol is simple: every PIPE message must have a PIPE status response. If the status response indicates success, the PIPE message was successfully delivered. If the status response indicates failure, the PIPE message was not successfully delivered. At a minimum, PIPE implementations must log the sending of a PIPE message (for the sender), the receipt of a PIPE message (for the recipient), and the status response to a PIPE message (both for the sender and the recipient).

PIPE provides a message structure to allow the exchange of PIP (Partner Interface Process) messages between trading partners. Below is a diagram of a PIPE message structure:



PIPE is currently being utilized in the industry. It is however, a work in progress. Feedback on PIPE is therefore encouraged. Excelergy will work with interested parties to further the development of XML standards.

Subject Areas and Release Schedule for PIPE

The transactional dialogs supporting the deregulated energy space have been segregated into multiple salient subject areas of "conversation". Each subject area equates to a PIP within the "Payload". The seven subject areas related to Customer Maintenance and Billing, and their equivalent EDI transaction set(s), are described below. The planned release date for each PIPE Subject Area is also listed.

XML - PIPE Subject Area	UIG EDI Equivalent	Subject Area Description	Release Date
Customer / Account Maintenance	814e,c,d,r	Messages for customer and account transactions to ESPs, LDCs, and other interested parties complementing business processes around customer setup and maintenance. Includes enrollments, changes, service drops and reinstatements.	<u>Released</u> 11/1/1999
Usage	867mu,iu,hu/824	Messages for ESPs, LDCs, and other interested parties to exchange usage data. Includes monthly, interval, and historical usage.	11/22/1999
Customer Acquisition and Fulfillment		Messages to support the customer procurement and pre-enrollment processes for interested parties complementing the customer fulfillment business processes. This includes bid, contract, volunteer, validation, customer authorization, and customer authentication.	12/13/1999
Invoice Presentment		Distribution and presentation messages to exchange invoice data and formatting tags required for invoice presentation. This definition will expand OFX to support the utility vertical. It also includes EBPP support parameters, messaging, print vendor support descriptors, scan code, and other.	1/3/2000
Billing	810/824	Messages for ESPs, LDCs, and other interested parties to exchange billing data to complement consolidated billing business processes.	1/10/2000
Partner Maintenance		Messages for ESPs, LDCs, and other interested parties to exchange root data. Data includes scheduled meter read dates and cycles, scheduled invoice mailing dates, remittance data, rate code, price plan details, etc.	1/31/2000
Payment/ Collections	820,568/824,248	Messages to allow ESPs, LDCs, and other interested parties to exchange payments, collections, and wire transfers, write-offs.	2/21/2000

Next Steps

In recognition of the importance of open standards and uniform business practices for B2B transactions within the energy industry, several industry groups have invested resources in support of the development of standards. The following groups advocate and/or contribute to the development of B2B standards.

- CUBR – Coalition for Uniform Business Rules
- EEI – Edison Electric Institute
- NEMA – National Energy Marketers Association
- GISB – Gas Industry Standards Board
- UIG – Utilities Industry Group

These organizations work with state Public Utility Commission working groups to establish B2B standards within a particular state.

Excelergy welcomes all parties that are interested in becoming involved in the development and deployment of XML-based standards for the deregulated retail energy industry. Interested parties should email xml@excelergy.com for more information.

Learn More about Excelergy Corporation

To learn more about Excelergy Corporation and its products and services, please visit us at <http://www.excelergy.com/>. Excelergy will continue to develop its XML knowledge base, incorporating the technology into its products.

Learn More about XML

Below is a list of sites that provide more information about XML:

<http://www.xml.com/>

<http://www.oasis-open.org/>

<http://www.biztalk.org/>

<http://www.xml.org/>

<http://www.w3c.org/>

<http://www.xmlendi.com/>

Learn More about Open Standards for the Deregulated Energy Industry

Below is a list of sites that provide more information about the implementation of uniform business practices and standard electronic business transactions for the deregulated energy industry:

<http://www.cubr.org/>

<http://www.ubpnet.org/>

<http://www.energymarketers.com/>

<http://www.gisb.org/>

Glossary

Document Type Definition (DTD) – XML-based vocabulary that can be industry, application or business specific.

Electronic Data Interchange (EDI) – a collection of standard message formats and element dictionary for businesses to exchange data electronically.

Energy Service Provider (ESP) – the entity selling the energy commodity to the end use consumer.

Extensible Markup Language (XML) – the structure developed by the W3C for describing data separate from the visual presentation of data.

HyperText Markup Language (HTML) – the basic language of the Web, which tells Web browsers how to display elements such as text, headlines and graphics.

Local Distribution Company (LDC) – the regulated local utility delivering the energy commodity to the end use customers.

Partner Interface Process (PIP) – An XML transaction describing a commercial process between two businesses.

Standard General Markup Language (SGML) – A highly complex, rigorous language with tags for structure and content.

APPENDIX A: RELEASE NOTES FOR PIPE™ 2.0A

Contents

0. What is PIPE 2.0a
1. Introduction
2. PIPE Overview
3. PIPE Messaging Protocol
4. PIPE Messages
5. Subject Areas and Release Schedule
6. CustomerMaintenance Subject Area Structure
7. Schemas vs DTDs
8. Contacting Us
9. Copyright Statement

0. What is PIPE 2.0a

This document is a draft of PIPE (Partner Interface Processes for Energy), an XML based messaging protocol for the exchange of transactions among trading partners in the retail energy industry. PIPE defines the format, content, and method of the transaction exchange along with the roles and responsibilities of the trading partners involved with that exchange. PIPE also provides support for managing and tracking the exchange.

Excelergy anticipates this to be the first of several releases that will form the foundation for a set of XML standards for the retail energy industry. This first release focuses on customer maintenance activities such as generation service requests. While many of the activities here relate to the UIG-EDI 814 standard, subsequent releases will include activities not explicitly

covered by EDI standards such as Partner Maintenance, Customer Acquisition and Fulfillment, and Invoice Presentment.

1. Introduction

Excelergy believes that XML can improve the competitive landscape within the retail energy market by lowering the barrier of entry to new competitors and unlocking the data contained in legacy customer systems. Retail energy transactions among trading partners are complex, data intensive communications. Today, the primary method for exchanging retail transaction information is electronic data interchange, or EDI. Unfortunately, EDI does not provide Energy Service Providers (ESPs) and Local Distribution Companies (LDCs) with a single set of procedures for determining who receives what customer and billing information, in what format and in what time period. The Utility Industry Group (UIG) created EDI standards specifically for the energy industry. However, there is wide latitude in the application of EDI standards, resulting in multiple flavors and complexity. XML, by its nature, provides a means to simplify the exchange of information in the retail energy industry.

2. PIPE Overview

PIPE is both a messaging protocol and a message format, addressing the need to be able to exchange transactions over the Internet (or private networks) and the content and structure of the transactions. The messaging protocol is basic and easily implemented in almost any networked environment. The message format is partitioned to allow subject areas to be implemented independently. In both cases, the use of XML makes implementation easier and includes validation of messages and data.

PIPE is currently being utilized in the industry. It is, however, a work in progress. Feedback on PIPE is encouraged and welcomed. Excelergy is happy to coordinate with interested parties to further the evolution of XML-based standards for the retail energy industry.

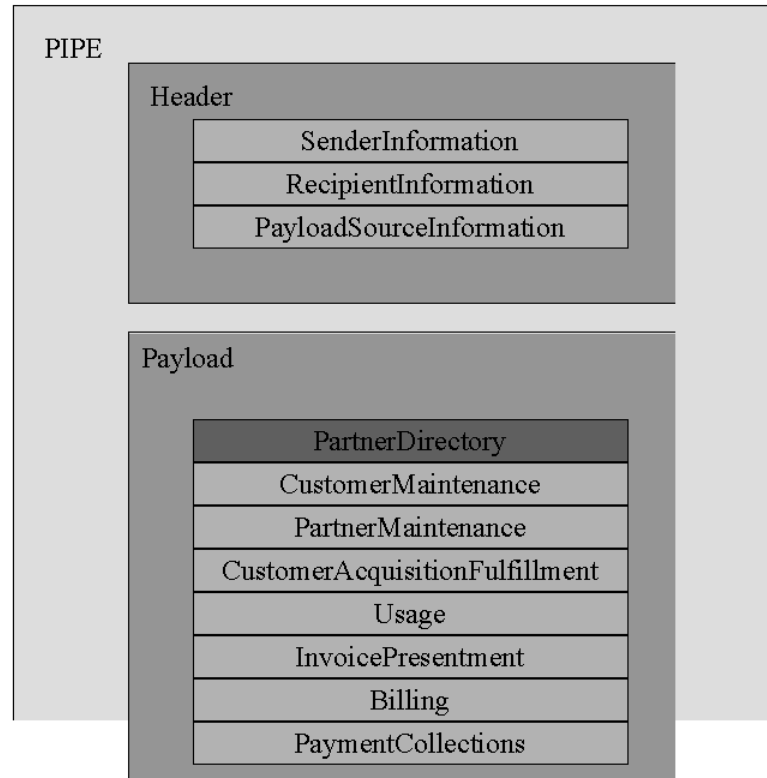
3. PIPE Messaging Protocol

The PIPE messaging protocol is simple: every PIPE message must have a PIPE status response. If the status response indicates success, the PIPE message was successfully delivered; if the status response indicates failure, the PIPE message was not successfully delivered. At a minimum, PIPE implementations must log the sending of a PIPE message (for the sender), the receipt of a PIPE message (for the recipient), and the status response to a PIPE message (both for the sender and the recipient).

Additional work needs to be done to define the set of possible responses and other optional features such as compression, authentication, and encryption.

4. PIPE Messages

PIPE provides a message structure to allow the exchange of **PIP (Partner Interface Process)** messages between trading partners.



PIPE

A **PIPE** message contains a **Header** and a **Payload**. Each **Payload** may contain a number of **PIP** messages. Every **PIPE** message is acknowledged by a **PIPEStatus** message indicating whether or not the message was successfully received. A **PIPEStatus** message is a **PIPE** message with a **PIPEStatus** component in place of a **Payload** component.

Header

The **Header** is used to hold information relating to the exchange of this **PIPE** message.

- **SenderInformation**

The **SenderInformation** tag is used to identify the sender of this **PIPE** message. Contact information is provided to help in the diagnosis and resolutions of problems related to the message.

- **RecipientInformation**

The **RecipientInformation** tag is used to identify the intended recipient of this **PIPE** message. Contact information is provided to help in the diagnosis and resolution of problems and questions about the message.

- **PayloadSourceInformation**

The **PayloadSourceInformation** tag is used to identify the source of the content of the **Payload**. Contact information is provided to help in the diagnosis and resolution of problems and questions about the **Payload**.

- **Others**

The **Header** could be used to provide value-added features such as compression, authentication and encryption for the exchange of **PIPE** messages.

Payload

The **Payload** holds the **PIP** messages being exchanged between the trading partners. Currently the **Payload** is acting as a bucket holding the exchanged **PIPs**, but as **PIPE** evolves the **Payload** could be used to provide value added features such as compression, authentication, and encryption for the exchanged **PIPs**.

A **Payload** consists of a **PartnerDirectory** and one or more **PIP** messages. **PIPs** do not need to be ordered and can be repeated (for example a **Payload** could hold ten thousand **CustomerMaintenance PIPs**.)

- **PartnerDirectory**

The **PartnerDirectory** defines all the trading partners involved in this **Payload's PIPs** in one place. The **ID** and **IDREF** feature of XML is used to ensure that all references to a trading partner refer to a trading partner defined in the **PartnerDirectory**.

- **CustomerMaintenance**

The **CustomerMaintenance PIP** set covers the enrollment, modification, and termination of customers, and their logistics, from a trading partner. This **PIP** is informed by the **UIG-EDI 814 specification**. Each **CustomerMaintenance PIP** identifies a single customer and the transactions that are related to that customer. There is no implied requirement that **all transactions** for a single customer be together.

- **Other PIP sets**

We have defined some of the other sets of **PIPs** to cover trading partner exchanges in the deregulated energy industry. Still others have not yet been identified but would fit within **PIPE**.

PIPEStatus

A **PIPEStatus** message is sent from the recipient to the sender for every **PIPE** message. The **PIPEStatus** should be used to log, track, and monitor the exchange of **PIPE** messages.

5. Subject Areas and Release Schedule

The transactional dialogs supporting the deregulated energy space have been segregated into multiple salient subject areas of "conversation." Each subject area equates to a PIP within the "Payload." The subject areas and their equivalent EDI transaction set(s) are described below. The planned release date for each PIPE Subject Area is also listed.

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Payment/ Collections	820,568/824,248	Messages to allow ESPs, LDCs, and other interested parties to exchange payments, collections, and wire transfers, write-offs.	2/21/2000

6. CustomerMaintenance Subject Area Structure

Please refer to Appendix C.

7. Schemas vs DTDs

This release of PIPE is defined with an XML DTD (Document Type Definition). XML Schema goes beyond the structural definition and validation of an XML DTD by adding many features including constraints, data types, and inheritance.

Excelergy has been tracking the progress of XML Schema specified by <http://www.w3.org/TR/xmlschema-1/> and <http://www.w3.org/TR/xmlschema-2/>. Standards for XML Schema have not yet been finalized, therefore Excelergy has not incorporated them into PIPE. Excelergy's intention is to fully specify PIPE with schemas.

8. Contacting Us

Feedback and comments regarding XML and PIPE can be sent to:

xml@excelergy.com

Requests for information about Excelergy can be sent to:

info@excelergy.com

9. Copyright Statement

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APPENDIX B: PIPE.DTD

```

<!ELEMENT PIPE (Header, (Payload | PIPEStatus))>
<!ATTLIST PIPE
  version CDATA #REQUIRED
>

<!ELEMENT Header (SenderInformation, RecipientInformation,
PayloadSourceInformation)>
<!ELEMENT Payload (TradingPartnerDirectory, CustomerMaintenance+)>
<!ATTLIST Payload
  payloadid CDATA #REQUIRED
>

<!ELEMENT PIPEStatus (#PCDATA)>
<!-- Make code an enumeration of possible codes -->
<!ATTLIST PIPEStatus
  code CDATA #REQUIRED
  phrase CDATA #REQUIRED
  payloadid CDATA #REQUIRED
>

<!ELEMENT SenderInformation (Name, DunAndBradstreetNumber,
  ContactInformation)>
<!ELEMENT RecipientInformation (Name, DunAndBradstreetNumber,
  ContactInformation)>
<!ELEMENT PayloadSourceInformation (Name, DunAndBradstreetNumber,
  ContactInformation)>

<!-- TradingPartner information directory-->
<!ELEMENT TradingPartnerDirectory (TradingPartner)*>
<!ELEMENT TradingPartner (Name, DunAndBradstreetNumber)>
<!ATTLIST TradingPartner
  tradingpartnerid ID #REQUIRED
  role (sender | recipient) #IMPLIED
>

<!ELEMENT DunAndBradstreetNumber (#PCDATA)>

<!-- CustomerMaintenance PIP -->
<!ELEMENT CustomerMaintenance (
  CustomerIdentification,
  (GenerationServicesRequest | HistoricalUsageRequest | MeterDataRequest |
  SpecialMeterReadRequest | SummaryIntervalInformationRequest |
  ReinstatementOfGenerationServicesRequest | DropOfGenerationServicesRequest
  | ChangeOfGenerationServicesRequest | GenerationServicesResponse |
  HistoricalUsageResponse | MeterDataResponse | SpecialMeterReadResponse |
  SummaryIntervalInformationResponse |
  ReinstatementOfGenerationServicesResponse |
  DropOfGenerationServicesResponse | ChangeOfGenerationServicesResponse)*
)>
<!ATTLIST CustomerMaintenance messageid CDATA #REQUIRED>

<!ELEMENT CustomerIdentification (
  Name,
  DistributorAccountNumber,

```

```

    SupplierAccountNumber,
    OldDistributorAccountNumber
)>
<!ELEMENT DistributorAccountNumber (#PCDATA)>
<!ELEMENT SupplierAccountNumber (#PCDATA)>
<!ELEMENT OldDistributorAccountNumber (#PCDATA)>

<!-- The Generic structures -->
<!ELEMENT Address (
    StreetAddress,
    StreetAddress?,
    City,
    State,
    ZipCode,
    CountryCode?
)>
<!ELEMENT StreetAddress (#PCDATA)>
<!ELEMENT City (#PCDATA)>
<!ELEMENT State (#PCDATA)>
<!ELEMENT ZipCode (#PCDATA)>
<!ELEMENT CountryCode (#PCDATA)>

<!ELEMENT ContactInformation (Name, TelephoneNumber, Email?)>
<!ELEMENT Name (#PCDATA)>
<!ELEMENT TelephoneNumber (#PCDATA)>
<!ELEMENT Email (#PCDATA)>

<!-- Meter information (nb MeterType can be more than 1) -->
<!ELEMENT MeterInformationShort (MeterNumber, SupplierRateCode)>

<!ELEMENT MeterInformation (
    MeterNumber,
    OldMeterNumber?,
    ProfileGroup?,
    DistributorRateCode,
    DistributorRateSubclassCode?,
    SupplierRateCode?,
    DistributorMeterCycle,
    MeterType+,
    MeterMultiplier?,
    NumberOfDials?,
    MeteringSignificanceForBilling*
)>
<!ELEMENT MeterNumber (#PCDATA)>
<!ELEMENT OldMeterNumber (#PCDATA)>
<!ELEMENT ProfileGroup (#PCDATA)>
<!ELEMENT DistributorRateCode (#PCDATA)>
<!ELEMENT DistributorRateSubclassCode (#PCDATA)>
<!ELEMENT SupplierRateCode (#PCDATA)>
<!ELEMENT DistributorMeterCycle (#PCDATA)>
<!ELEMENT MeterType (#PCDATA)>
<!ELEMENT MeterMultiplier (#PCDATA)>
<!ELEMENT NumberOfDials (#PCDATA)>
<!ELEMENT MeteringSignificanceForBilling (#PCDATA)>

<!ELEMENT Response (ReasonCode, ReasonText?)>
<!ATTLIST Response

```



```

    action (accept | reject) #REQUIRED
  >
  <!ELEMENT ReasonCode (#PCDATA)>
  <!ELEMENT ReasonText (#PCDATA)>

  <!-- End of Generic structures -->

  <!-- Generation Service Request -->
  <!-- Maps to 814E CE -->

  <!ELEMENT GenerationServicesRequest (
    Billing,
    CustomerContractEffectiveDateTime,
    ParticipatingInterest,
    PercentTaxExemption,
    SupplierRateAmount,
    (SupplierRateCode | MeterInformationShort+)
  )>
  <!ATTLIST GenerationServicesRequest
    transaction CDATA #REQUIRED
    systemdate CDATA #REQUIRED
  >
  <!ELEMENT Billing EMPTY>
  <!ATTLIST Billing
    type (supplier | distributor | both) #REQUIRED
    calc (supplier | distributor | both) #REQUIRED
  >
  <!ELEMENT CustomerContractEffectiveDateTime (#PCDATA)>
  <!ELEMENT ParticipatingInterest (#PCDATA)>
  <!ELEMENT PercentTaxExemption (#PCDATA)>
  <!ELEMENT SupplierRateAmount (#PCDATA)>

  <!-- Generation Services response -->
  <!ELEMENT GenerationServicesResponse (
    ((Response , PercentTaxExemption?) | GenerationServices)
  )>
  <!ATTLIST GenerationServicesResponse
    transaction CDATA #REQUIRED
    systemdate CDATA #REQUIRED
    requesttransaction CDATA #REQUIRED
  >
  <!ELEMENT GenerationServices (
    CustomerReferenceNumber?,
    ServiceAddress,
    CustomerBilling?,
    ThirdPartyForCopiesOfNotices?,
    ThirdPartyForCopiesOfBills?,
    Billing,
    DistributorBillingCycle,
    DeliveryPoint?,
    IntervalLevelIndicator?,
    CustomerContractEffectiveDateTime,
    ServicePeriodStart,
    ParticipatingInterest,
    EligibleLoadPercentage,
    CapacityObligation?,
    TransmissionObligation?,

```

```

    NumberOfMonths,
    PeakDemand12Months?,
    SupplierRateAmount?,
    TotalKWh,
    MeterInformation+
  )>
<!ELEMENT CustomerReferenceNumber (#PCDATA)>
<!ELEMENT DistributorBillingCycle (#PCDATA)>
<!ELEMENT DeliveryPoint (#PCDATA)>
<!ELEMENT IntervalLevelIndicator (#PCDATA)>
<!ELEMENT ServicePeriodStart (#PCDATA)>
<!ELEMENT EligibleLoadPercentage (#PCDATA)>
<!ELEMENT CapacityObligation (#PCDATA)>
<!ELEMENT TransmissionObligation (#PCDATA)>
<!ELEMENT NumberOfMonths (#PCDATA)>
<!ELEMENT PeakDemand12Months (#PCDATA)>
<!ELEMENT TotalKWh (#PCDATA)>
<!ELEMENT ServiceAddress (
  Address,
  County?,
  ContactInformation?
)>
<!ELEMENT County (#PCDATA)>
<!ELEMENT CustomerBilling (
  Name?,
  Address,
  ContactInformation?
)>
<!ELEMENT ThirdPartyForCopiesOfNotices (
  Name?,
  Address,
  ContactInformation?
)>
<!ELEMENT ThirdPartyForCopiesOfBills (
  Name?,
  Address,
  ContactInformation?
)>
<!-- Generation Services
  paymentarrangement (y | n) #REQUIRED
  budgetbilling (y | n) #REQUIRED
-->

<!-- Historical Usage request -->
<!-- maps to 814E HU -->

<!ELEMENT HistoricalUsageRequest EMPTY>
<!-- Historical Usage Request
  transaction CDATA #REQUIRED
  systemdate CDATA #REQUIRED
-->

<!-- Historical Usage response -->
<!ELEMENT HistoricalUsageResponse (Response | HistoricalUsageWillBeSent)>
<!ELEMENT HistoricalUsageWillBeSent EMPTY>
<!-- Historical Usage Response
  transaction CDATA #REQUIRED
-->

```

```

    systemdate CDATA #REQUIRED
    requesttransaction CDATA #REQUIRED
>

<!-- Meter Data request -->
<!-- maps to 814E MI-->

<!ELEMENT MeterDataRequest EMPTY>
<!ATTLIST MeterDataRequest
    transaction CDATA #REQUIRED
    systemdate CDATA #REQUIRED
>

<!-- Meter Data response -->
<!ELEMENT MeterDataResponse (Response | MeterDataWillBeSent)>
<!ELEMENT MeterDataWillBeSent EMPTY>
<!ATTLIST MeterDataResponse
    transaction CDATA #REQUIRED
    systemdate CDATA #REQUIRED
    requesttransaction CDATA #REQUIRED
>

<!-- Special Meter Read request -->
<!-- maps to 814E SR -->

<!ELEMENT SpecialMeterReadRequest (RequestedReadDate)>
<!ATTLIST SpecialMeterReadRequest
    transaction CDATA #REQUIRED
    systemdate CDATA #REQUIRED
>

<!-- Special Meter Read response -->
<!ELEMENT SpecialMeterReadResponse (Response | RequestedReadDate)>
<!ELEMENT RequestedReadDate (#PCDATA)>
<!ATTLIST SpecialMeterReadResponse
    transaction CDATA #REQUIRED
    systemdate CDATA #REQUIRED
    requesttransaction CDATA #REQUIRED
>

<!-- Summary Interval request-->
<!-- maps to 814E SI -->

<!ELEMENT SummaryIntervalInformationRequest EMPTY>
<!ATTLIST SummaryIntervalInformationRequest
    transaction CDATA #REQUIRED
    systemdate CDATA #REQUIRED
>

<!-- SI RESPONSE -->
<!ELEMENT SummaryIntervalInformationResponse (Response |
SummaryIntervalReporting)>
<!ELEMENT SummaryIntervalReporting EMPTY>
<!ATTLIST SummaryIntervalInformationResponse
    transaction CDATA #REQUIRED
    systemdate CDATA #REQUIRED
    requesttransaction CDATA #REQUIRED

```

```

>

<!-- Drop request -->
<!-- maps to 814D -->

<!ELEMENT DropOfGenerationServicesRequest (CustomerForDrop, DropReasonCode,
DropReasonText, ServicePeriodEnd?)>

<!ATTLIST DropOfGenerationServicesRequest
  transaction CDATA #REQUIRED
  systemdate CDATA #REQUIRED
  initiated (distributor | supplier) #REQUIRED
  action (permanant | temporary) #REQUIRED
>

<!ELEMENT CustomerForDrop (ForwardingAddress?, ContactInformation)>
<!ELEMENT DropReasonCode (#PCDATA)>
<!ELEMENT DropReasonText (#PCDATA)>
<!ELEMENT ServicePeriodEnd (#PCDATA)>

<!ELEMENT ForwardingAddress (Name, Address)>

<!-- Drop response -->
<!ELEMENT DropOfGenerationServicesResponse (Response | ServicePeriodEnd?)>

<!ATTLIST DropOfGenerationServicesResponse
  transaction CDATA #REQUIRED
  systemdate CDATA #REQUIRED
  requesttransaction CDATA #REQUIRED
  action (permanant | temporary) #REQUIRED
>

<!-- Reinstatement request -->
<!-- Maps to 814R -->

<!ELEMENT ReinstatementOfGenerationServicesRequest (ServiceInformation,
ContactInformation, CustomerBilling, ThirdPartyForCopiesOfNotices,
ThirdPartyForCopiesOfBills, DistributorBillingCycle, Billing,
DeliveryPoint, IntervalReportingIndicator,
CustomerContactedDistributorToReinstateDate, ServicePeriodStart,
ParticipatingInterest, EligibleLoadPercentage, PercentTaxExemption,
CapacityObligation, TransmissionObligation, SupplierRateAmount,
MeterInformation)>
<!ELEMENT ServiceInformation (Address, County)>
<!ATTLIST ReinstatementOfGenerationServicesRequest
  transaction CDATA #REQUIRED
  systemdate CDATA #REQUIRED
  paymentarrangement (y | n) #REQUIRED
  budgetbilling (y | n) #REQUIRED
>
<!ELEMENT IntervalReportingIndicator (#PCDATA)>
<!ELEMENT CustomerContactedDistributorToReinstateDate (#PCDATA)>

<!-- Reinstatement response -->
<!ELEMENT ReinstatementOfGenerationServicesResponse (
  (ContactInformation, CustomerBilling, ThirdPartyForCopiesOfNotices,
  ThirdPartyForCopiesOfBills)

```

```

| Response)>

<!-- ReinstatementOfGenerationServicesResponse
transaction CDATA #REQUIRED
systemdate CDATA #REQUIRED
requesttransaction CDATA #REQUIRED
-->

<!-- Change Of Generation Services request -->
<!-- maps to 814C -->

<!-- ChangeOfGenerationServicesRequest ((CustomerReferenceNumber,
ServiceInformation, ContactInformation, CustomerBilling,
ThirdPartyForCopiesOfNotices, ThirdPartyForCopiesOfBills, ServiceIndicator,
DistributorBillingCycle?, Billing, DeliveryPoint?, EffectiveDate,
ServicePeriodStart?, ServicePeriodEnd?, ParticipatingInterest?,
EligibleLoadPercentage?, CapacityObligation?, TransmissionObligation?,
MeterInformation?) | (ServiceIndicator, IntervalLevelIndicator?, Billing?,
ParticipatingInterest?, PercentTaxExemption?, SupplierRateAmount?,
(SupplierRateCode | MeterInformationShort+)))>

<!-- ChangeOfGenerationServicesRequest
transaction CDATA #REQUIRED
systemdate CDATA #REQUIRED
initiated (supplier | distributor) #REQUIRED
-->

<!-- ServiceIndicator (#PCDATA)>
<!-- EffectiveDate (#PCDATA)>

<!-- Change Of Generation Services response -->
<!-- ChangeOfGenerationServicesResponse (
Response
|(ServiceIndicator, DistributorBillingCycle?, Billing?, DeliveryPoint?,
ServicePeriodStart?, ServicePeriodEnd?, ParticipatingInterest?,
EligibleLoadPercentage?, CapacityObligation?, TransmissionObligation?,
MeterInformation?) | (ServiceIndicator, IntervalLevelIndicator?, Billing?,
EffectiveDate, ParticipatingInterest?, PercentTaxExemption?,
SupplierRateAmount?, (SupplierRateCode | MeterInformationShort+))
-->

<!-- ChangeOfGenerationServicesResponse
transaction CDATA #REQUIRED
systemdate CDATA #REQUIRED
requesttransaction CDATA #REQUIRED
initiated (supplier | distributor) #REQUIRED
-->

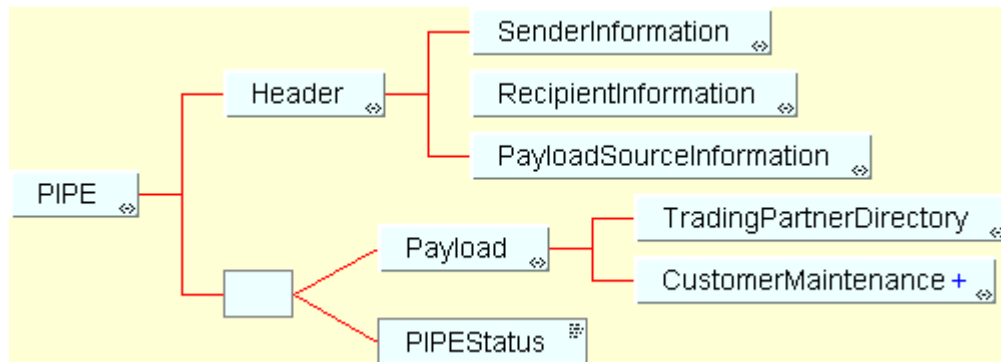
<!-- © Copyright 1999 Excelergy Corporation. All rights reserved.
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```

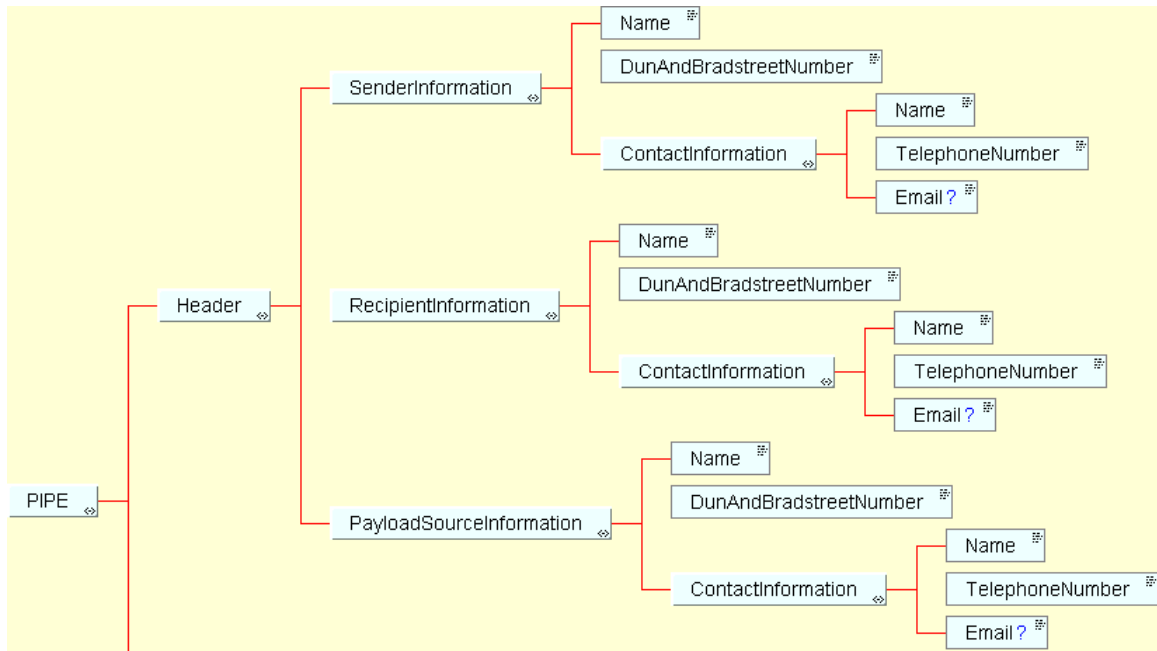
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APPENDIX C: PIPE MESSAGE

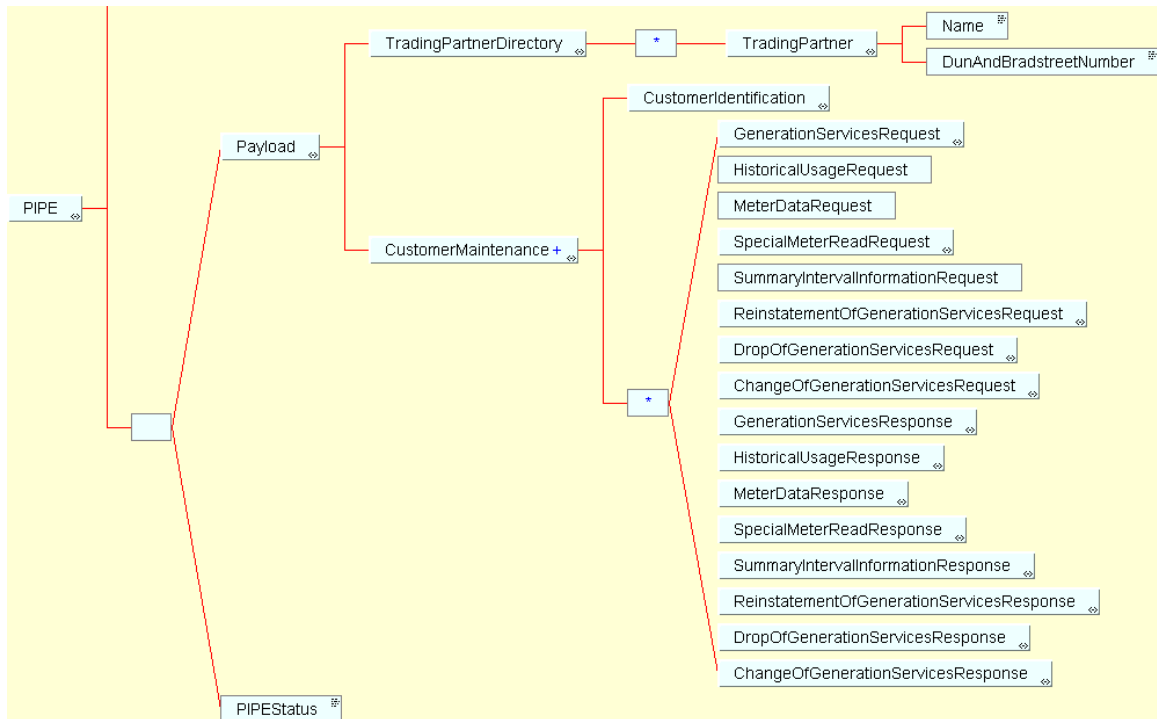
Overview of a PIPE Message



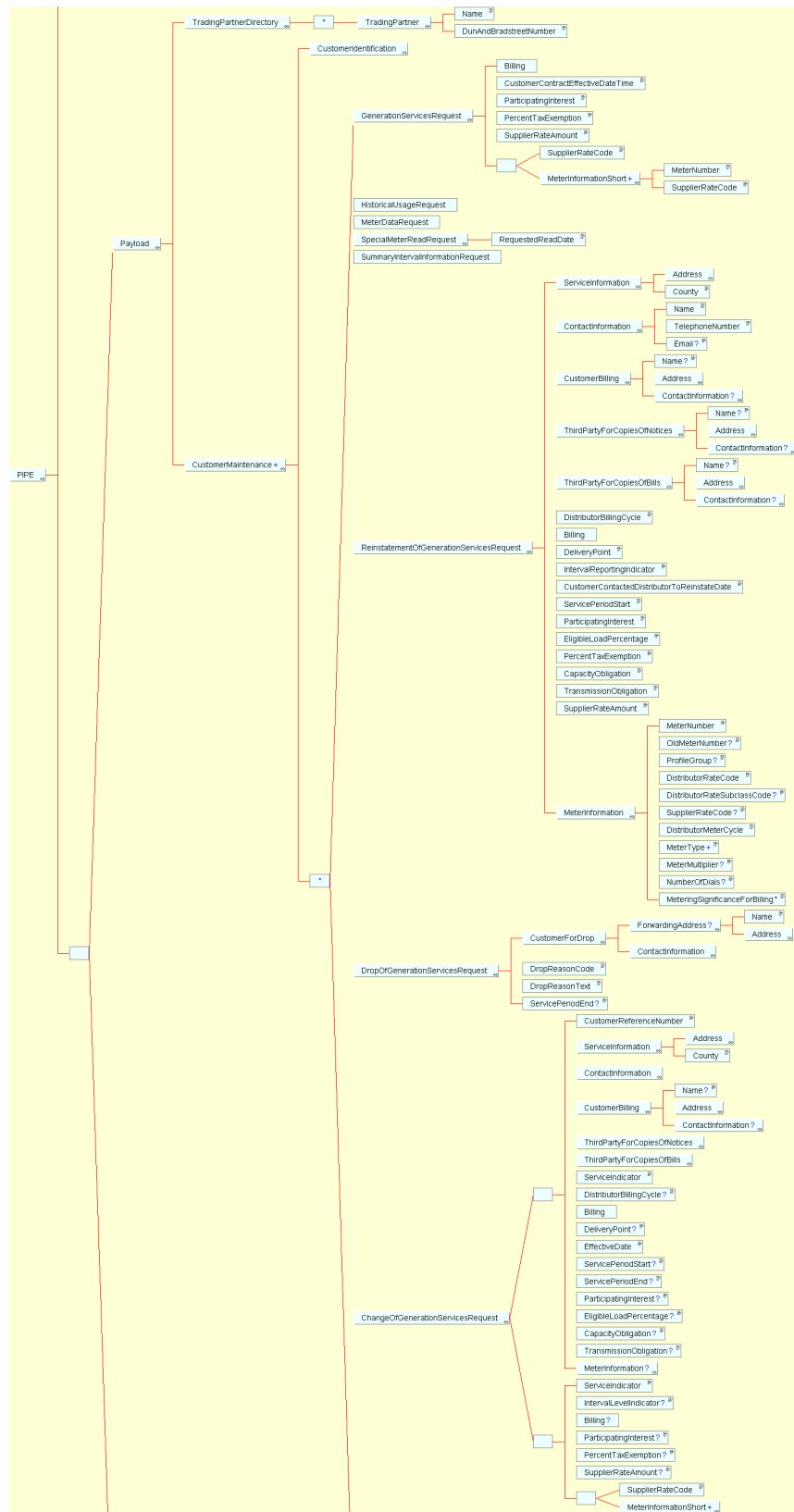
Detailed Look at a PIPE Message <Header>



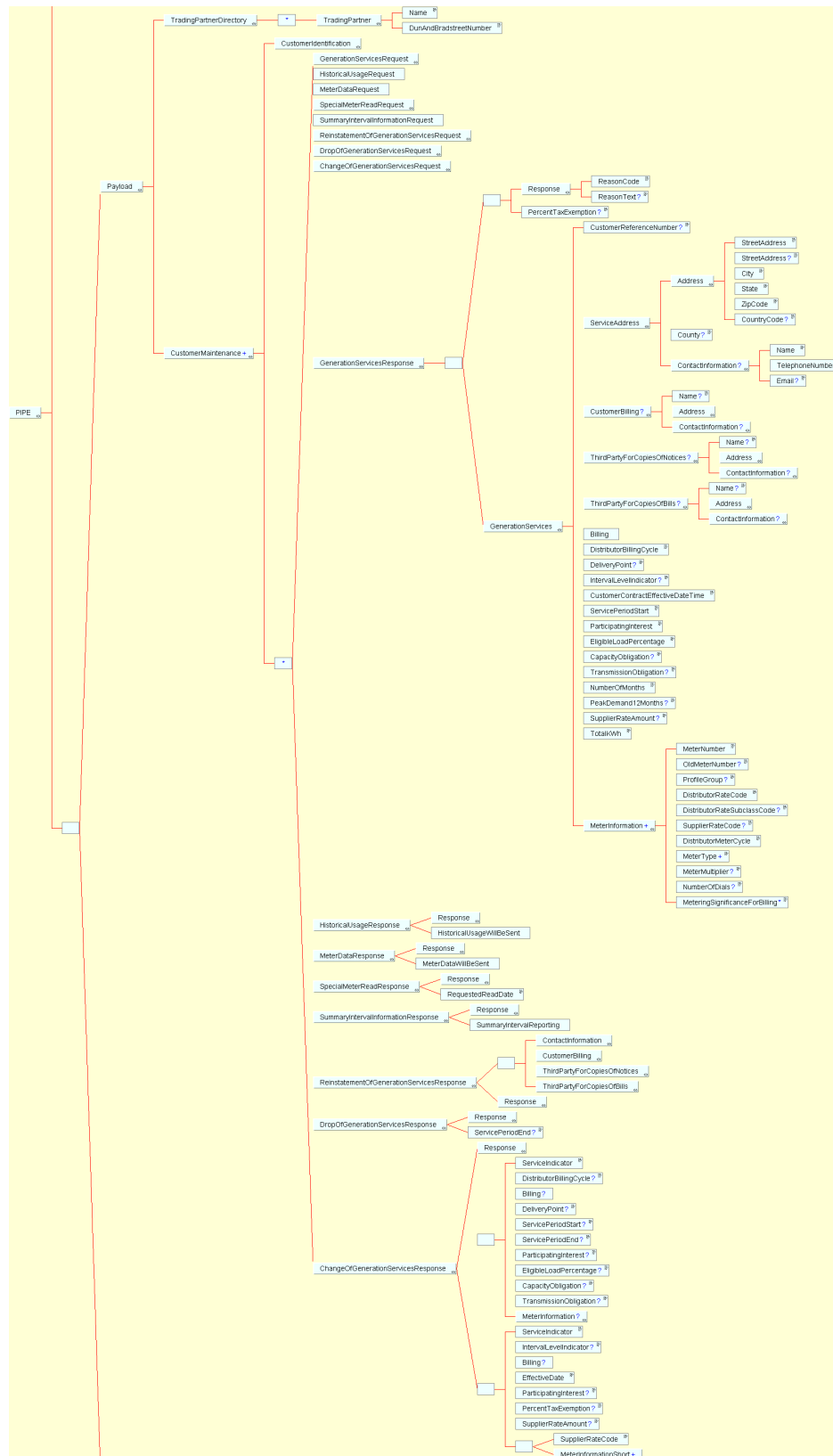
Overview of a PIPE Message <Payload>



Detailed Look at <CustomerMaintenance> PIP Requests



Detailed Look at <CustomerMaintenance> PIP Responses



APPENDIX D: PAYLOAD.XML (SAMPLE)

```
<?xml version="1.0"?>
<!DOCTYPE PIPE SYSTEM "PIPE.dtd">
<PIPE version="2.0a">
  <Header>
    <SenderInformation>
      <Name>Data Mover Corp</Name>
      <DunAndBradstreetNumber>111222333</DunAndBradstreetNumber>
      <ContactInformation>
        <Name>Jim Smith</Name>
        <TelephoneNumber>123-345-4444</TelephoneNumber>
        <Email>jsmith@esignup.com</Email>
      </ContactInformation>
    </SenderInformation>

    <RecipientInformation>
      <Name>NEW Distributor Company</Name>
      <DunAndBradstreetNumber>222333444</DunAndBradstreetNumber>
      <ContactInformation>
        <Name>Eddie Johnston</Name>
        <TelephoneNumber>123-444-4333</TelephoneNumber>
        <!-- Optional!! <Email>ejohnston@webmaster.com</Email> -->
      </ContactInformation>
    </RecipientInformation>

    <PayloadSourceInformation>
      <Name>Esignup Company</Name>
      <DunAndBradstreetNumber>333444555</DunAndBradstreetNumber>
      <ContactInformation>
        <Name>John Allison</Name>
        <TelephoneNumber>123-444-5444</TelephoneNumber>
        <Email>jallison@powerflow.com</Email>
      </ContactInformation>
    </PayloadSourceInformation>
  </Header>

  <Payload payloadid="1999-10-28T13:41:32@esignup.com">
    <!-- TradingPartner information directory-->
    <TradingPartnerDirectory>
      <TradingPartner tradingpartnerid="TP27" role="recipient">
        <Name>ACME Energy Distributor</Name>
        <DunAndBradstreetNumber>545566667</DunAndBradstreetNumber>
        <!-- Insert other TradingPartner info here-->
      </TradingPartner>
      <TradingPartner tradingpartnerid="TP28" role="sender">
        <Name>Powerflow Energy Supplier</Name>
        <DunAndBradstreetNumber>555432789</DunAndBradstreetNumber>
        <!-- Insert other TradingPartner info here-->
      </TradingPartner>
    </TradingPartnerDirectory>

    <!-- End of overall structure -->
  </Payload>
</PIPE>
```

```

<!--REQUESTS -->
<CustomerMaintenance messageid="199910200000009">
  <CustomerIdentification>
    <Name>Wally's Department Stores</Name>
    <DistributorAccountNumber>564768999998</DistributorAccountNumber>
    <SupplierAccountNumber>6777</SupplierAccountNumber>
    <OldDistributorAccountNumber></OldDistributorAccountNumber>
  </CustomerIdentification>

  <GenerationServicesRequest transaction="1" systemdate="19991021">
    <Billing type="distributor" calc="distributor"/>

    <CustomerContractEffectiveDateTime>199910210750ET</CustomerContractEffectiveDateTime>
    <ParticipatingInterest>1.00000</ParticipatingInterest>
    <PercentTaxExemption>1.00</PercentTaxExemption>
    <SupplierRateAmount>.0500</SupplierRateAmount>
    <!-- Either -->
    <!-- <SupplierRateAmount></SupplierRateAmount> -->
    <!-- OR -->
    <MeterInformationShort>
      <MeterNumber>ALL</MeterNumber>
      <SupplierRateCode>R1</SupplierRateCode>
    </MeterInformationShort>
  </GenerationServicesRequest>

  <HistoricalUsageRequest transaction="2" systemdate="19991021"/>

  <MeterDataRequest transaction="3" systemdate="19991021"/>

  <SpecialMeterReadRequest transaction="4" systemdate="19991021">
    <RequestedReadDate>19991101</RequestedReadDate>
  </SpecialMeterReadRequest>

  <SummaryIntervalInformationRequest transaction="5"
systemdate="19991021"/>

  <DropOfGenerationServicesRequest transaction="6" systemdate="19991021"
initiated="distributor" action="permanant">
    <!-- account for dropinitiated in DTD -->
    <CustomerForDrop>
      <ForwardingAddress>
        <Name>Jane Stewart</Name>
        <Address>
          <StreetAddress>16 Englewood Ct</StreetAddress>
          <City>Pittsburgh</City>
          <State>PA</State>
          <ZipCode>96666</ZipCode>
          <CountryCode>USA</CountryCode>
        </Address>
      </ForwardingAddress>
      <ContactInformation>
        <Name>Jane Stewart</Name>
        <TelephoneNumber>912-454-4555</TelephoneNumber>
      </ContactInformation>
    </CustomerForDrop>

```

```

    <DropReasonCode>CCE</DropReasonCode>
    <DropReasonText>Contract Expired</DropReasonText>
    <ServicePeriodEnd></ServicePeriodEnd>
  </DropOfGenerationServicesRequest>

  <ReinstatementOfGenerationServicesRequest transaction="7"
systemdate="19991021"
paymentarrangement="y" budgetbilling="n">
    <ServiceInformation>
        <Address>
            <StreetAddress>10 Maple Avenue</StreetAddress>
            <City>Boston</City>
            <State>MA</State>
            <ZipCode>02135</ZipCode>
        </Address>
        <County>Suffolk</County>
    </ServiceInformation>
    <ContactInformation>
        <Name>Joe Smith</Name>
        <TelephoneNumber>617-855-1212</TelephoneNumber>
    </ContactInformation>
    <CustomerBilling>
        <Name>John Brown</Name>
        <Address>
            <StreetAddress>15 Beacon Street</StreetAddress>
            <City>Brookline</City>
            <State>MA</State>
            <ZipCode>02146</ZipCode>
            <CountryCode>USA</CountryCode>
        </Address>
        <ContactInformation>
            <Name>Susan Brown</Name>
            <TelephoneNumber>617-733-4578</TelephoneNumber>
        </ContactInformation>
    </CustomerBilling>
    <ThirdPartyForCopiesOfNotices>
        <Address>
            <StreetAddress>5 Elm Street</StreetAddress>
            <City>Boston</City>
            <State>MA</State>
            <ZipCode>02135</ZipCode>
            <CountryCode>USA</CountryCode>
        </Address>
        <ContactInformation>
            <Name>Alex Johnson</Name>
            <TelephoneNumber>617-277-4578</TelephoneNumber>
        </ContactInformation>
    </ThirdPartyForCopiesOfNotices>
    <ThirdPartyForCopiesOfBills>
        <Address>
            <StreetAddress>5 Elm Street</StreetAddress>
            <City>Boston</City>
            <State>MA</State>
            <ZipCode>02135</ZipCode>
            <CountryCode>USA</CountryCode>
        </Address>
        <ContactInformation>

```

```

        <Name>Alex Johnson</Name>
        <TelephoneNumber>617-277-4578</TelephoneNumber>
    </ContactInformation>
</ThirdPartyForCopiesOfBills>
<DistributorBillingCycle>12</DistributorBillingCycle>
<Billing type="distributor" calc="distributor"/>
<DeliveryPoint>AE</DeliveryPoint>
<IntervalReportingIndicator></IntervalReportingIndicator>
<CustomerContactedDistributorToReinstateDate>199910220900ET</CustomerCo
ntactedDistributorToReinstateDate>
<ServicePeriodStart>10111999</ServicePeriodStart>
<ParticipatingInterest>1.00000</ParticipatingInterest>
<EligibleLoadPercentage>1.00000</EligibleLoadPercentage>
<PercentTaxExemption>1.00</PercentTaxExemption>
<CapacityObligation>19.61</CapacityObligation>
<TransmissionObligation>19.64</TransmissionObligation>
<SupplierRateAmount>.0500</SupplierRateAmount>
<MeterInformation>
    <MeterNumber>F33729254</MeterNumber>
    <ProfileGroup>14</ProfileGroup>
    <DistributorRateCode>RES</DistributorRateCode>
    <DistributorRateSubclassCode>1</DistributorRateSubclassCode>
    <SupplierRateCode>R1</SupplierRateCode>
    <DistributorMeterCycle>15</DistributorMeterCycle>
    <MeterType>KHM0N</MeterType>
    <MeterMultiplier>1</MeterMultiplier>
    <NumberOfDials>5.0</NumberOfDials>

    <MeteringSignificanceForBilling>51</MeteringSignificanceForBilling>
</MeterInformation>
</ReinstatementOfGenerationServicesRequest>

<ChangeOfGenerationServicesRequest transaction="8" systemdate="19991021"
initiated="distributor">
    <CustomerReferenceNumber>136</CustomerReferenceNumber>
    <ServiceInformation>
        <Address>
            <StreetAddress>10 Maple Street</StreetAddress>
            <City>Boston</City>
            <State>MA</State>
            <ZipCode>02135</ZipCode>
        </Address>
        <County>Suffolk</County>
    </ServiceInformation>
    <ContactInformation>
        <Name>John Smith</Name>
        <TelephoneNumber>617-252-7878</TelephoneNumber>
    </ContactInformation>
    <CustomerBilling>
        <Name>John Stuart</Name>
        <Address>
            <StreetAddress>20 Elm Drive</StreetAddress>
            <City>Pittsburgh</City>
            <State>PA</State>
            <ZipCode>96666</ZipCode>
            <CountryCode>USA</CountryCode>
        </Address>
    </CustomerBilling>
</ChangeOfGenerationServicesRequest>

```

```

    <ContactInformation>
      <Name>Bob Smith</Name>
      <TelephoneNumber>222-454-4545</TelephoneNumber>
    </ContactInformation>
  </CustomerBilling>
  <ThirdPartyForCopiesOfNotices>
    <Name>Anne Jones</Name>
    <Address>
      <StreetAddress>15 Main Street</StreetAddress>
      <City>Boston</City>
      <State>MA</State>
      <ZipCode>02135</ZipCode>
      <CountryCode>USA</CountryCode>
    </Address>
    <ContactInformation>
      <Name>Anne Jones</Name>
      <TelephoneNumber>617-458-8989</TelephoneNumber>
    </ContactInformation>
  </ThirdPartyForCopiesOfNotices>
  <ThirdPartyForCopiesOfBills>
    <Name>15 Main Street</Name>
    <Address>
      <StreetAddress>15 Main Street</StreetAddress>
      <City>Boston</City>
      <State>MA</State>
      <ZipCode>02135</ZipCode>
      <CountryCode>USA</CountryCode>
    </Address>
    <ContactInformation>
      <Name>Anne Jones</Name>
      <TelephoneNumber>Anne Jones</TelephoneNumber>
    </ContactInformation>
  </ThirdPartyForCopiesOfBills>
  <ServiceIndicator></ServiceIndicator>
  <DistributorBillingCycle>14</DistributorBillingCycle>
  <Billing type="distributor" calc="distributor"/>
  <DeliveryPoint>AE</DeliveryPoint>
  <EffectiveDate>19991121</EffectiveDate>
  <ServicePeriodStart></ServicePeriodStart>
  <ServicePeriodEnd></ServicePeriodEnd>
  <ParticipatingInterest>1.0000</ParticipatingInterest>
  <EligibleLoadPercentage>1.0000</EligibleLoadPercentage>
  <CapacityObligation>19.45</CapacityObligation>
  <TransmissionObligation>19.02</TransmissionObligation>
  <MeterInformation>
    <MeterNumber>F33729254</MeterNumber>
    <OldMeterNumber></OldMeterNumber>
    <ProfileGroup>14</ProfileGroup>
    <DistributorRateCode></DistributorRateCode>
    <DistributorRateSubclassCode></DistributorRateSubclassCode>
    <DistributorMeterCycle></DistributorMeterCycle>
    <MeterType></MeterType>
    <MeterMultiplier>KHMOM</MeterMultiplier>
    <NumberOfDials></NumberOfDials>

  <MeteringSignificanceForBilling>41</MeteringSignificanceForBilling>
</MeterInformation>

```



```

    </ChangeOfGenerationServicesRequest>
  </CustomerMaintenance >

<!--RESPONSES -->
<CustomerMaintenance messageid="1999102100000101">
  <CustomerIdentification>
    <Name>Wally's Department Stores</Name>
    <DistributorAccountNumber>564768999998</DistributorAccountNumber>
    <SupplierAccountNumber>6777</SupplierAccountNumber>
    <OldDistributorAccountNumber></OldDistributorAccountNumber>
  </CustomerIdentification>

  <GenerationServicesResponse transaction="566" systemdate="19991022"
requesttransaction="1">
    <GenerationServices paymentarrangement="n" budgetbilling="n">
      <CustomerReferenceNumber>136</CustomerReferenceNumber>
      <ServiceAddress>
        <Address>
          <StreetAddress>125 George St</StreetAddress>
          <StreetAddress></StreetAddress>
          <City>Pittsburgh</City>
          <State>PA</State>
          <ZipCode>96666</ZipCode>
          <CountryCode>USA</CountryCode>
        </Address>
        <County>Allegheny</County>
        <ContactInformation>
          <Name>Lisa Jones</Name>
          <TelephoneNumber>122-444-5444</TelephoneNumber>
          <Email></Email>
        </ContactInformation>
      </ServiceAddress>
      <CustomerBilling>
        <Name>Wally's Department Stores</Name>
        <Address>
          <StreetAddress>12 High St</StreetAddress>
          <StreetAddress>A/R Department</StreetAddress>
          <City>Cambridge</City>
          <State>MA</State>
          <ZipCode>22233</ZipCode>
          <CountryCode>USA</CountryCode>
        </Address>
        <ContactInformation>
          <Name>Pam Ward</Name>
          <TelephoneNumber></TelephoneNumber>
        </ContactInformation>
      </CustomerBilling>
      <ThirdPartyForCopiesOfNotices>
        <Name></Name>
        <Address>
          <StreetAddress></StreetAddress>
          <StreetAddress></StreetAddress>
          <City></City>
          <State></State>
          <ZipCode></ZipCode>
          <CountryCode></CountryCode>
        </Address>

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    <ContactInformation>
      <Name></Name>
      <TelephoneNumber></TelephoneNumber>
    </ContactInformation>
  </ThirdPartyForCopiesOfNotices>
  <ThirdPartyForCopiesOfBills>
    <Name>Wally's Department Stores</Name>
    <Address>
      <StreetAddress>12 Post St</StreetAddress>
      <StreetAddress>Credits/collections Group</StreetAddress>
      <City>Medford</City>
      <State>MA</State>
      <ZipCode>02053</ZipCode>
      <CountryCode>USA</CountryCode>
    </Address>
    <ContactInformation>
      <Name>Credit Manager</Name>
      <TelephoneNumber>122-334-5555</TelephoneNumber>
    </ContactInformation>
  </ThirdPartyForCopiesOfBills>
  <Billing type="distributor" calc="distributor"/>
  <DistributorBillingCycle>12</DistributorBillingCycle>
  <DeliveryPoint>AE</DeliveryPoint>
  <IntervalLevelIndicator></IntervalLevelIndicator>

  <CustomerContractEffectiveDateTime>199910220900ET</CustomerContractEffectiveD
ateTime>
    <ServicePeriodStart>19991101</ServicePeriodStart>
    <ParticipatingInterest>1.00000</ParticipatingInterest>
    <EligibleLoadPercentage>1.00000</EligibleLoadPercentage>
    <CapacityObligation>19.61</CapacityObligation>
    <TransmissionObligation>19.54</TransmissionObligation>
    <NumberOfMonths>12</NumberOfMonths>
    <PeakDemand12Months>11120</PeakDemand12Months>
    <SupplierRateAmount>.0500</SupplierRateAmount>
    <TotalKWh>61333</TotalKWh>
    <MeterInformation>
      <MeterNumber>F33729254</MeterNumber>
      <ProfileGroup>14</ProfileGroup>
      <DistributorRateCode>RES</DistributorRateCode>
      <DistributorRateSubclassCode>1</DistributorRateSubclassCode>
      <SupplierRateCode>R1</SupplierRateCode>
      <DistributorMeterCycle>14</DistributorMeterCycle>
      <MeterType>KHM0N</MeterType>
      <MeterMultiplier>1</MeterMultiplier>
      <NumberOfDials>5.0</NumberOfDials>
      <MeteringSignificanceForBilling></MeteringSignificanceForBilling>
    </MeterInformation>
  </GenerationServices>
  <!-- Only on reject! <PercentTaxExemption></PercentTaxExemption> -->
</GenerationServicesResponse>

  <HistoricalUsageResponse transaction="567" systemdate="19991022"
requesttransaction="2">
    <Response action="accept">
      <ReasonCode>HUU</ReasonCode>
      <ReasonText>HistoricalUsageUnavailable</ReasonText>

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    </Response>
  </HistoricalUsageResponse>

  <MeterDataResponse transaction="568" systemdate="19991022"
  requesttransaction="3">
    <MeterDataWillBeSent/>
  </MeterDataResponse>

  <SpecialMeterReadResponse transaction="569" systemdate=" "
  requesttransaction="4">
    <RequestedReadDate>19991101</RequestedReadDate>
  </SpecialMeterReadResponse>

  <SummaryIntervalInformationResponse transaction="570" systemdate=" "
  requesttransaction="5">
    <!-- One of -->
    <Response action="reject">
      <ReasonCode>A76</ReasonCode>
      <ReasonText>LDC Account not found</ReasonText>
    </Response>
    <!-- OR
    <SummaryIntervalReporting/>
    -->
  </SummaryIntervalInformationResponse>

  <DropOfGenerationServicesResponse transaction="571"
  systemdate="19991022" requesttransaction="6" action="permanant">
    <Response action="reject">
      <ReasonCode>A76</ReasonCode>
      <ReasonText>LDC Account Not Found</ReasonText>
    </Response>
    <!-- or -->
    <!--<ServicePeriodEnd></ServicePeriodEnd> -->
  </DropOfGenerationServicesResponse>

  <ReinstatementOfGenerationServicesResponse transaction="572"
  systemdate="19991022" requesttransaction="7">
    <ContactInformation>
      <Name>Jim Smith</Name>
      <TelephoneNumber>123-345-4444</TelephoneNumber>
    </ContactInformation>
    <CustomerBilling>
      <Address>
        <StreetAddress>20 Park Street</StreetAddress>
        <City>Pittsburgh</City>
        <State>PA</State>
        <ZipCode>02146</ZipCode>
      </Address>
      <ContactInformation>
        <Name>Jim Smith</Name>
        <TelephoneNumber>123-345-4444</TelephoneNumber>
      </ContactInformation>
    </CustomerBilling>
    <ThirdPartyForCopiesOfNotices>

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    <Address>
      <StreetAddress>10 Main Street</StreetAddress>
      <City>Boston</City>
      <State>MA</State>
      <ZipCode>02135</ZipCode>
    </Address>
    <ContactInformation>
      <Name>Anne Burke</Name>
      <TelephoneNumber>617-222-4545</TelephoneNumber>
    </ContactInformation>
  </ThirdPartyForCopiesOfNotices>
  <ThirdPartyForCopiesOfBills>
    <Address>
      <StreetAddress>10 Main Street</StreetAddress>
      <City>Boston</City>
      <State>MA</State>
      <ZipCode>02135</ZipCode>
    </Address>
    <ContactInformation>
      <Name>Anne Burke</Name>
      <TelephoneNumber>617-222-4545</TelephoneNumber>
    </ContactInformation>
  </ThirdPartyForCopiesOfBills>
  <!--or Response -->
  <!--<Response action="reject">
    <ReasonCode>A76</ReasonCode>
    <ReasonText>Account Not Found</ReasonText>
  </Response>-->
</ReinstatementOfGenerationServicesResponse>

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  <ChangeOfGenerationServicesResponse transaction="573"
systemdate="19991022" requesttransaction="8" initiated="distributor">
  <ServiceIndicator></ServiceIndicator>
  <DistributorBillingCycle></DistributorBillingCycle>
  <Billing type="distributor" calc="both"/>
  <DeliveryPoint>AE</DeliveryPoint>
  <ServicePeriodStart>10291998</ServicePeriodStart>
  <ServicePeriodEnd>10301999</ServicePeriodEnd>
  <ParticipatingInterest>1.0000</ParticipatingInterest>
  <EligibleLoadPercentage>1.0000</EligibleLoadPercentage>
  <CapacityObligation>19.65</CapacityObligation>
  <TransmissionObligation>19.30</TransmissionObligation>
  <MeterInformation>
    <MeterNumber>F234598</MeterNumber>
    <OldMeterNumber>A236780</OldMeterNumber>
    <ProfileGroup>14</ProfileGroup>
    <DistributorRateCode></DistributorRateCode>
    <DistributorRateSubclassCode></DistributorRateSubclassCode>
    <DistributorMeterCycle></DistributorMeterCycle>
    <MeterType>14</MeterType>
    <MeterMultiplier>KHM0N</MeterMultiplier>
    <NumberOfDials>1</NumberOfDials>

  <MeteringSignificanceForBilling>5.0</MeteringSignificanceForBilling>
  </MeterInformation>
</ChangeOfGenerationServicesResponse>

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</CustomerMaintenance>
</Payload>
</PIPE>
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