

**Pennsylvania Web Portal Working Group**

**Technical Implementation Standard**

**System to System – Historical Interval Usage**

**PUC Docket No. M-2009-2092655**

**Related Order Issued September 3, 2015**

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# Version History

|  |  |  |
| --- | --- | --- |
| Version | Date | Description of Change(s) |
| 0.1D | 3/14/2016 | Initial Draft Version |
| 0.2D | 3/17/2016 | Revised as follows:   1. General Notes – added bullet stating changes require EDEWG approval 2. Data Response – removed duplicate bullet ‘most recent version of data’ 3. Data Response - added bullets regarding data volumes 4. Data Response – updated DST to match the other standards 5. Security & Technical – added Data-at-Rest information |
| 0.3D | 3/31/2016 | Revised as follows:   1. Removed comment boxes on business reject codes 2. Added valid quantity qualifiers to 1.3.5.b 3. Added the WSDL provided by PPL to end of document (p.38). |
| 1.0 | 4/5/2016 | Revised as follows:   1. As discussed during 4/5 WPWG call, updated Namespace in 1.2.5 and Note 6 on p.38 to reflect each EDC may have their own Namespace which is to be defined in their user guide documentation 2. Updated version # and date. WPWG approved, final version for submission to PUC |
| 1.10 | 8/23/2016 | StS-HIU CC #002 revised as follows:   1. Revised Data Dictionary for new XML Tags 2. Replaced XML Examples using new XML Tags |
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# Summary

This document contains the technical standard developed by the Electronic Data Exchange Working Group’s (EDEWG) Web Portal Working Group (WPWG). The PaPUC required EDEWG to develop a standardized solution for the acquisition of historical interval usage and billing quality interval usage data via a secure web-portal, as specifically directed and detailed within the Pennsylvania Public Utility Commission’s (PaPUC’s) Smart Meter Procurement and Installation Order entered December 6th 2012 at Docket M-2009-2092655. Via Secretarial Letter dated 4/17/2014, in response to a request from EDEWG leadership, the PaPUC agreed that the contents herein would represent the minimally required standards to which each EDC’s solution must adhere, as opposed to standards applicable to a “standardized” solution common to all EDCs. Subsequently the PaPUC required EDEWG to develop standards for System-to-System (StS) functionality under Order entered and September 3rd 2015 at Docket M-2009-2092655.

This Technical Implementation Standard applies to the use of the StS Historical Interval Usage method for sharing smart meter data. This method utilizes a platform which allows an authorized user’s IT systems to communicate directly with the web portal system of the EDC without requiring a user to manually log into the web portal itself and leverage the user interface. The requestor connects to the EDC’s system exchanging data via XML transactions.

# General Notes

1. The following Electric Distribution Companies (EDCs) are required to support the System-to-System Web Interface:
   1. Duquesne Light Company
   2. First Energy (MetEd, Penelec, Penn Power, West Penn Power
   3. PECO
   4. PPL Electric Utilities
2. The web portal is intended for the following customer-authorized third parties: Licensed Electric Generation Suppliers (EGSs), Act 129 Conservation Service Providers (CSPs) contracted with the EDCs, and their contracted agents.   CSPs (either Curtailment or Conservation) desiring to access the web portals addressed by this framework either be provided access as agents of an existing EGS **OR** be licensed as EGSs themselves as a prerequisite to receiving access.
3. The PaPUC has not directed that this web portal use existing or potentially future EDC online customer communication platforms.
4. Any related items not specifically addressed by these standards are at the discretion of the individual EDCs.
5. Any change, modification or update to this data standard requires EDEWG approval via the change control process.

# Secure Web Portal Standard

**System-to-System (StS) Historical Interval Usage**

The Web Portal solution standards can be broken down into the following processes:

1. **Certification, Access, and Customer Privacy**
2. **Data Request**
3. **Data Response**
4. **Security and Technical**
5. **Tracking and Reporting**
6. **EDEWG Leadership Responsibilities**
7. **Certification, Access, and Customer Privacy**
8. Portal user eligibility
   1. Each request will be logged into a unique Web Portal for each EDC.
   2. The portal is “primarily intended for licensed EGSs and customer-authorized third parties”.
   3. Entities licensed by the PUC as an EGS are eligible to access the web-portal. (Licensee status is available on the PaPUC’s website at <http://www.puc.state.pa.us/consumer_info/electricity/suppliers_list.aspx>. )
      1. These include EGSs themselves, Conservation Service Providers (considered by PaPUC as “CSPs”), and demand response / load management providers (also known as Curtailment Service Providers, considered by PJM as “CSPs”). (Other third parties not considered PUC-licensed entities in this regard include but are not limited to researchers, public agencies with subpoenas, PaPUC-licensed Natural Gas Suppliers (NGSs), customers themselves, and other customer-authorized entities.)
      2. CSPs (either Curtailment or Conservation) desiring to access the web portals addressed by this framework either be provided access as agents of an existing EGS **OR** be licensed as EGSs themselves as a prerequisite to receiving access.
         1. The PUC has the authority to penalize EGSs for fraudulent operations.
         2. CSPs contracted with EDCs for Act 129 work are governed by PaPUC regulations over the EDC and the principal/agent relationship between the EDC and CSP.
      3. Unlicensed subcontractors or agents of licensed EGSs, such as Electronic Data Interchange (EDI) and billing providers, are eligible to receive access to the web portal on behalf of licensees that they represent, but their use must be directly associated with those licensees under the assumption that users are only accessing the portal in support of service to a specific licensed entity. For example, a provider obtaining usage for an account on behalf of fictitious supplier “ABC Energy” must be logged in such that the “ABC Energy” licensee is associated with and held accountable for associated use of the portal by that provider on ABC Energy’s behalf. *(This is covered in more detail in Section 2.5, Tracking and Reporting.)*
      4. The capability for other 3rd parties (entities not licensed by the PaPUC as EGSs) to access this information is outside the scope of the WPWG effort. Such entities are **NOT** eligible for access to the web portal and must obtain customer data via other means.
         1. Alternative means of obtaining customer data include contacting the customer directly or – at the discretion of the EDC – submitting requests to the EDC accompanied by proper Letters Of Authorization, or “LOAs” (i.e. Duquesne’s current process).
9. Access Management
   1. EDCs may provide access to the web portal for said EGS after verifying that the EGS is PaPUC-licensed. (Completion of EDI certification testing is not a prerequisite.)
   2. The EDC and EGS must complete and document a pre-production connectivity test, during which the EGS calls the EDC web service for at least one account number specified by the EDC and receives a successful response from the EDC.
      1. The EDC reserves the right to require EGSs to conduct more comprehensive testing and to require use of both test URLs and test credentials as part of that testing.
   3. 3rd parties that require Web Portal access but not full certification or treatment as an EDI-capable trading partner will have to submit a request to that EDC directly for web portal access. (The EDC must verify that the party is PaPUC-licensed as an EGS or broker/marketer prior to granting access.)
   4. The minimal requirement is for a single non-human system level user ID per PaPUC-licensed EGS entity.
      1. Each use of the portal is directly associated with exactly one PaPUC-licensed entity.
      2. EDCs will associate a unique non-human system level ID with an entity’s name and DUNS+4 number(s). (The user ID cannot be the user’s e-mail address.)

***NOTE:*** *EDCs may elect to implement system level IDs at the organizational level, meaning one system level ID per user regardless of the number of DUNS+4 entities associated with that user, dependent upon the feasibility and cost-effectiveness of this option.*

* + 1. The system user ID must be associated with a **non-public** e-mail address directly associated with either the licensed entity or the associated subcontractor/agent. (Examples of forbidden public e-mail addresses include but are not limited to Gmail, Yahoo, Hotmail, and AOL.)
    2. The EDC must document their process for maintaining the non-human system level ID credentials in the user guide.
       1. Scheduled interval of system level ID password resets. EDC must provide notice no earlier than 15 days prior to the reset event. In the event of a breach in security, the EDC may immediately reset the system level ID password and notify the EGS.

1. The EDC must publish and communicate availability of a System-to-System user guide for all portal users which covers the following:
2. Functional use of the solution
3. Any EDC-specific administrative or security conditions more stringent than the standards published in this document
4. Technical implementation information in order to facilitate system to system, examples include but not limited to…
   * + 1. Production Web Service URL
       2. QA/Test Web Service URL
5. The EDC must maintain, re-publish, and re-communicate the availability of the user guide as changes occur
6. The PaPUC will audit and if necessary pursue licensee organizations, not individuals.
7. Customer Privacy
   1. Prior PaPUC regulatory mandates require that the EDC make this data available to EGSs and place the burden of customer authorization on licensed EGSs and their agents, who are subject to PUC audit for the same.
   2. The Web Portal will adhere to the privacy standards mandated by the PaPUC regardless of the customer’s preference for release of information on file with the EDC.
8. **Data Request**

Once an EDC has established System-to-System access to the Web Portal, the requestor will be able to initiate requests for the available data via an online, system based process.

1. At a minimum, the EDC must satisfy requests for usage data at the ACCOUNT and METER levels.
2. An EGS may request either account or meter-level information for one (1) customer account per request.
3. The same eligibility rules leveraged in providing historical usage in response to EDI-based requests apply when providing usage via the portal. (Example: PECO does not honor EDI-based historical usage requests on finalled accounts.)
4. The EDC web portal must be able to accommodate such xml request by providing the requested usage data simultaneously in the required xml format.
5. The EDC will document the required name space for the xml request in their user guide documentation.
6. The request must include the following data request parameters:
   1. Authorized system level username and password
   2. EDC Account Number
   3. Usage Dates (“From” and “To”)
      1. If omitted or blank, EDC would return all available data up to a maximum no smaller than the most recent twelve months (assuming that at least twelve months is available)
      2. EDC reserves the right to set a maximum on the time horizon over which usage can be returned and may reject requests for date ranges exceeding this maximum range. (Per PUC, EDC maximum must be no less than the most recent 12 months).
7. Account-Level or Meter-Level (but not both in the same request)
8. **Data Response**

Upon receipt of a Request, each EDC will respond with the associated data for each account number requested.

1. The Response process begins once a valid Request has been submitted.
2. The EDC will respond to each request in “near real time” meaning requests will NOT be queued. The request call will work or it will not. Failures for any reason must be re-attempted by the requestor
   1. This solution is NOT intended for large data load or ETL (Extract, Transform and Load) functionality. It is intended to compliment the rolling 10-day file solution.
   2. The EDC should endeavor to produce a system that is capable of processing a single account or meter level IU request for 24 months of data within 5 seconds.
   3. The EDC should endeavor to produce a system that is capable of processing 100,000 single account or meter level IU requests for 24 months of data in any given 24 hour period.
   4. The EDC will log each request including the supplier or third party name but will NOT place caps on the number of requests sent by any one supplier or third party.
   5. In order to ensure fairness, the EDC reserves the right to monitor and/or restrict the number of requests sent by any individual supplier or third party in an attempt to ensure system availability for everyone.
3. The name space in the xml request will be…

<soap:address location="http://localhost:9722/WPWG/WPWG\_SYS\_TO\_SYS.asmx" />

1. The EDC may reject the Request and must provide a descriptive rejection reason.
   1. System level rejections will utilize standard HTTP rejection codes and messages for rejection scenarios including but not limited to the following:
      1. HTTP 401 – Unauthorized or missing credentials
      2. HTTP 429 – Too many requests (may apply if EDC sets rate limits)
      3. HTTP 500 – Service unavailable (For instance, during maintenance windows)
   2. Business level logic rejections will utilize existing reject reason codes similar to those used in EDI.
      1. The EDC may reject individual account numbers within a given request based on errors unique to the specific account numbers requested (for instance, invalid or ineligible account numbers, not an interval-metered account, interval data unavailable/missing, etc.).
      2. The minimum standard will be to replicate the EDI reject reason. Follow-up questions on reject reasons will be supported by pre-existing EDC supplier support processes.
      3. Valid rejection codes for business level logic:
         1. A76 – Invalid Account
         2. UMA – Unmetered Account
         3. HIU – Historical Interval Usage Unavailable (PPL)
         4. SNP – Service Not Provided (PECO only; if gas account requested)
         5. 008 – Account Exists But Is Not Active
         6. NIA – Not Interval Account (PECO)
         7. MAN – Missing Account Number
         8. MDL – Missing Data Level
2. For each account number requested at the account level where the EDC has data available, and the Request was not rejected, the EDC will send the usage data.
   1. Each element listed is defined identically to the manner in which it is defined in the Pennsylvania Electronic Data Exchange Working Group (EDEWG) EDI Implementation Guides. Considering the PUC Order states that Meter Level should be provided, the EDCs proposed that the first implementation will delivery Account level, and each EDC will work toward providing Meter level as the market matures.
   2. Data elements available to users in the downloadable XML file format for accepted requests must include the following:
      1. Usage Level (Account-Level Usage or Meter-Level Usage)
      2. Customer identifier (varies by EDC; EDC account number is an example)
      3. Demand (calculated peak demand for billing period)
      4. Bill Cycle
      5. Load Profile
      6. Rate Class
      7. Rate Subclass (if applicable for EDC; Otherwise, leave blank)
      8. Special Meter Configuration (currently indicates net metered status)
      9. Peak Load Contribution, kWh (PLC, also known as “capacity obligation) – current value
      10. Future Peak Load Contribution, kWh (PLC, also known as “future capacity obligation)
      11. Network Service Peak Load, kWh (NSPL, also known as “transmission obligation”) – current value
      12. Future Network Service Peak Load, kWh (NSPL, also known as “future transmission obligation”)
      13. Meter Number (Meter-Level only)
      14. Meter Multiplier (Meter-Level only)
      15. Usage Date
      16. Interval Increment for Usage Data (15, 30 or 60 minute)
      17. Quantity Qualifier for detailed interval usage (designates actual vs. estimate and load vs. generation as well as unavailability of a specific interval)
          1. Valid Quantity Qualifiers…
             1. QD = Actual Consumption (load)
             2. KA = Estimated Consumption (load)
             3. 87 = Actual Generation
             4. 9H = Estimated Generation
             5. 20 = Unavailable (data not available for interval reading)
      18. Detailed usage data, aka consumption or kWh, spanning the 12 most recent billed periods as well as bill-quality interval data available within 48 hours of the read that the EDC has not yet billed. (NOTE: 12 months may not be available, in which case the portal will return data for the available number of months.)
3. Historical interval usage data shared that pertains to the standard originally required by March of 2014 must be billed data, defined as data from a billing cycle for which the EDC has already billed the customer.
   1. This data is subject to change in the event that the EDC cancels and rebills those periods.
   2. Only the most recent version of billed data will be available in the portal.
4. Data within 48 hours of the read must be “bill-quality”, defined as “data that is sourced from an EDC’s meter data management system that has completed the process of being verified, estimated, and edited” as cited from Page 16 of the PaPUC Final Order. This means that the EDC has not necessarily billed the associated period yet.
5. All timestamps presented in the portal should be presented in 24-hour Eastern Time.
6. All intervals must be presented in hour-ending format.
   1. End of day hour ending label will be 2359
   2. **NOTE:** The solution assumes that all EDCs bill a 24-hour period of usage on a midnight-to-midnight basis.
7. The Historical Interval Usage data must accommodate Daylight Savings Time (DST) events on the appropriate date.
8. Spring DST – For the short DST usage delivery date only, the interval reading during the time event will be null. The DST intervals will be reported as follows:
   1. 60 minute – 0300 interval null
   2. 30 minute – 0230 and 0300 intervals null
   3. 15 minute – 0215, 0230, 0245 and 0300 intervals null
9. Fall DST – For the long DST usage delivery date only, additional interval usage values will be populated in the columns at the end of each record as a second set of data for hour-ending 0200, labeled 0200D (0115D, 0130D, 0145D). These columns will include null values for all other usage delivery days. The DST intervals will be repeated as follows:
10. 60 minute – 0200 interval repeated
11. 30 minute – 0130 and 0200 intervals repeated
12. 15 minute – 0115, 0130, 0145 and 0200 intervals repeated.
13. Precision of usage values will be dictated by the degree of precision available from each EDC’s AMI network. This solution will not dictate usage precision standards.
14. On-peak and off-peak characteristics of usage and demand are ***not*** necessary to include in the web portal, as these elements are typically tied to EDC tariffs. EGSs may calculate such components at their own discretion.
15. **Security and Technical**

Customer data must be delivered with the highest integrity and privacy. The Security standards cover the standards, tools, and policies that will be considered for the exchange of this data.

Several of these standards are varied adaptations of the Guidelines for Smart Grid Cybersecurity published by the National Institute of Standards and Technology, or NIST. (NIST also refers to these guidelines as Interagency Report 7628, or NISTIR 7628.)

*NOTE: EDC policies and procedures, including but not limited to those governing information security and configuration management, may be more stringent than the standards identified in this section. In the event of contradictions between these standards and EDC policies and procedures, the more restrictive of the two shall govern.*

1. No data governed within the scope of these standards will be publicly accessible.
   1. Valid user login to an EDC’s secure web portal is required to access all related data.
   2. All other access must be denied.
   3. The user must log on each and every time they access the portal. (Any capability designed to “remember” the user should not preclude user logon.)
2. At a minimum, EDC portal solutions must be compatible with the two most recent major versions of Microsoft’s Internet Explorer web browser.
3. Each EDC’s portal solution requires the use of a non-self-signed SSL certificate issued by a Microsoft-trusted authority for governance of secure user connections via HTTPS, both before and after user authentication at logon. Both requestors and EDCs would be responsible for transmitting all data – both calls and responses – using SSL encryption.
4. The web portal will limit system level user to one concurrent session per credential.
5. The portal will lock out the system level user credential and prevent access if the system fails to successfully login with the same credential five times within a 30-minute period.
6. The EDC must notify portal users of any planned changes no later than two weeks prior to the planned implementation of those changes. (NOTE: This does not apply to implementation of added functionality that would have no impact on existing portal functions.)
7. If an EDC’s secure web portal experiences either technical problems or a cybersecurity incident (as defined by EDC information security procedures) which substantially disrupts portal operations OR increases the risk of compromising portal information (inadvertently allowing unauthorized users access to either customer usage data or user credentials), then the EDC must immediately perform the following:
   1. Deny all new attempts to access the portal by default.
   2. Communicate status to portal users and stakeholders as appropriate given the nature of the issue or incident.
      1. Avoid disclosing restricted details that could aid cybersecurity attackers.
      2. Consider EDEWG Leadership and PaPUC liaisons to EDEWG as impacted stakeholders.
   3. Leave the above restrictions in place until deeming that the issue has been resolved and that any associated risk has been sufficiently mitigated. (This will vary based on several factors, potentially including but not limited to identification of the source of the issue and the degree to which any collateral damage has been contained.)
   4. This standard does not supersede pre-existing EDC cybersecurity incident response plans. EDCs will always execute their own plans and rely on their own definitions with regard to cybersecurity incidents.
8. Data-at-Rest
   1. Defined as stored electronic information that is not in motion/transit, regardless of storage medium. Storage mediums include but are not limited to databases, file systems, storage networks, memory (temporary / cached or otherwise), and other writeable media.
   2. EDCs and third parties authorized to use these solutions (as well as their agents) will employ reasonable technological measures to properly secure related customer, account, and usage data-at-rest within the scope of these solutions. Such protections may include the use of encryption for rendering such data unusable, unreadable, and/or indecipherable to unauthorized individuals. Existing measures in place for this or other sensitive customer information procured via other means may also be sufficient.
9. **Tracking and Reporting**

*NOTE: The PA WPWG is not aware of any specific PaPUC reporting requirements relative to portal use and therefore assumes that the following standards would support any necessary ad hoc reporting for either EDCs or market participants on portal use and administration.*

1. The EDC must track the following portal-related event information on a per-user basis:
   1. User changes (user ID, associated entity, last updated date/time, add/update/terminate)
   2. User login attempts (user ID entered, login attempt date/time, successful/failed)
   3. Accounts queried (user ID, associated entity, EDC account number requested, date/time, yes/no for data provided, account-level/meter-level if “yes”, reason for rejection if “no”)
   4. Quarterly review status of licensed entities (user ID, attestation date/time)
   5. EDCs reserve the right to log additional information at their discretion, including the requester’s IP address.
2. The portal must perform all logging on the server-side.
3. The portal must retain all of the above portal-related event information for a period of at least three years.
4. Each EDC’s portal must provide the capability for users associated with each licensed entity to query and download any of the above portal-related event information within a specified date range for one or more users associated with that specific entity (but no others).
5. The EDC must have the capability to query and download any of the above portal-related event information for one or more users and/or licensed entities.
6. The portal must not allow any user, including EDC users, to directly edit the above log data.

# StS Historical Interval Usage – Data Dictionary

**HIU Interval Usage Request**

|  |  |  |
| --- | --- | --- |
| **Element** | **Description** | **Use** |
| CustomerAccountNumber | Customer Identifier (varies by EDC; example is EDC Account Number) | Required |
| FromDate | Beginning Date, the start date for the data being requested by the EGS. If null, the EDC will send up to the most recent 12 months of data, if available. Format as CCYY-MM-DD | Optional |
| ToDate | Ending Date, the start date for the data being requested by the EGS. If null, the EDC will send up to the most recent 12 months of data, if available. Format as CCYY-MM-DD | Optional |
| RequestLevel | Level of Data being requested by the EGS. Valid values are…  “ACCOUNT”  “METER” | Required |

**HIU Reject Response (used only when no HTTP level rejection is sent)**

|  |  |  |
| --- | --- | --- |
| **Element** | **Description** | **Use** |
| StatusCode | Code to denote reason for transaction rejection. Valid values…  “A76” = Invalid Account  “UMA”= Unmetered Account  “HIU” = Historical Interval Usage Unavailable (PPL)  “SNP” = Service Not Provided (PECO only when request is gas account)  “008” = Account Exists But Is Not Active  “NIA” = Not Interval Account (PECO)  “MAN” = Missing Account Number  “MDL” = Missing Data Level | Required |
| StatusMessage | Text description of reject reason code. Recommend using above code descriptions | Required |
| AccountInfo | | |
| CustomerAccountNumber | Customer Identifier (varies by EDC; example is EDC Account Number). If the EDC\_ACCT\_NO was not sent on the request, it will not be present in the response. | Conditional |

**HIU Account Level – Interval Usage Response**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Element** | **Description** | | | **Use** |
| AccountInfo | | | | |
| UsageLevel | | “ACCOUNT” = Identifies level of usage data at the ACCOUNT level. | Required | |
| CustomerAccountNumber | | Customer Identifier (varies by EDC; example is EDC Account Number) | Required | |
| Demand | | Calculated peak demand for billing period. Required if demand is being recorded for the account. | Conditional | |
| BillCycle | | Bill cycle for customer account. | Required | |
| LoadProfile | | EDC Load Profile | Required | |
| LDCRateCode | | EDC Rate Code/Class | Required | |
| LDCRateSubcode | | EDC Rate Subclass. Required if present | Required | |
| SpecialMeterConfiguration | | Used to denote presence of net meter. Required if net meter is present.  “NET METER” (sent by Duquesne, FirstEnergy, PECO)  The following values sent by PPL…  ASUN = Net Metering Solar  AWIN = Net Metering Wind  AHYD = Net Metering Hydro  ABIO = Net Metering Biomass  AWST = Net Metering Waste  ACHP = Net Metering Combined Heat and Power  AMLT = Net Metering Multiple Different Sources  NSUN = Non-Net Metering Solar  NWIN = Non-Net Metering Wind  NHYD = Non-Net Metering Hydro  NBIO = Non-Net Metering Biomass  NWST = Non-Net Metering Waste  NCHP = Non-Net Metering Combined Heat and Power  NFOS = Non-Net Metering Fossil Fuel  NMLT = Non-Net Metering Multiple Different Sources | Conditional | |
| PeakLoadContribution | | Capacity Obligation/PLC | Required | |
| FuturePeakLoadContribution | | Future Capacity Obligation / PLC. Required if calculated and stored in EDC system | Required | |
| NetworkServicePeakLoad | | Transmission Obligation / NSPL / NITS. | Required | |
| FutureNetworkPeakLoad | | Future Transmission Obligation / NSPL / NITS. Required if calculated and stored in EDC system. | Required | |
| AccountLevelUsage | | | | |
| Usage – repeated for each UsageDate reported | | | | |
| UsageDate | | Date of readings | Required | |
| IntervalType | | Interval data increment. Valid Values are “15”, “30” and “60”. | Required | |
| IntervalUsageData | | | | |
| UsageInterval – Repeated for each interval data reading | | | | |
| TimePeriod | | Time Interval. Valid Values for 60 minute intervals are “0100”, “0200” etc. and Valid Values for 15 minute intervals are “0015”, “0030”, etc. | Required | |
| Kwh | | Consumption quantity in KWH. Decimal values vary by EDC | Required | |
| QuantityQualifier | | Quantity Qualifier for kWh reported, repeated for each interval reading. Valid values…  “KA” = Estimated Quantity Delivered  “QD” = Actual Quantity Delivered  “20” = Unavailable (meter data not available for interval)  “87” = Actual Quantity Delivered (Net Metering / Generation)  “9H” = Estimated Quantity Delivered (Net Metering / Generation) | Required | |

**HIU Meter Level – Interval Usage**

|  |  |  |
| --- | --- | --- |
| **Element** | **Description** | **Use** |
| AccountInfo | | |
| UsageLevel | “METER” = Identifies level of usage data | Required |
| CustomerAccountNumber | Customer Identifier (varies by EDC; example is EDC Account Number) | Required |
| Demand | Calculated peak demand for billing period. Required if demand is being recorded for the account. | Conditional |
| BillCycle | Bill cycle for customer account. | Required |
| LoadProfile | EDC Load Profile | Required |
| LDCRateCode | EDC Rate Code/Class | Required |
| LDCRateSubcode | EDC Rate Subclass. Required if present | Required |
| Special Meter Configuration | Used to denote presence of net meter. Required if net meter is present.  “NET METER” (sent by Duquesne, FirstEnergy, PECO)  The following values sent by PPL…  ASUN = Net Metering Solar  AWIN = Net Metering Wind  AHYD = Net Metering Hydro  ABIO = Net Metering Biomass  AWST = Net Metering Waste  ACHP = Net Metering Combined Heat and Power  AMLT = Net Metering Multiple Different Sources  NSUN = Non-Net Metering Solar  NWIN = Non-Net Metering Wind  NHYD = Non-Net Metering Hydro  NBIO = Non-Net Metering Biomass  NWST = Non-Net Metering Waste  NCHP = Non-Net Metering Combined Heat and Power  NFOS = Non-Net Metering Fossil Fuel  NMLT = Non-Net Metering Multiple Different Sources | Conditional |
| PeakLoadContribution | Capacity Obligation/PLC | Required |
| FuturePeakLoadContribution | Future Capacity Obligation / PLC. Required if calculated and stored in EDC system | Required |
| Network Service Peak Load | Transmission Obligation / NSPL / NITS. | Required |
| FutureService Network Peak Load | Future Transmission Obligation / NSPL / NITS. Required if calculated and stored in EDC system. | Required |
| MeterLevelUsage – repeated for each meter | | |
| MeterInfo | | |
| MeterNumber | Meter Number. Required when sending METERLEVEL usage data. | Required |
| MeterMultiplier | Meter multiplier for meter. Required when sending METERLEVEL usage data. | Required |
| Usage – repeated for each UsageDate reported | | |
| UsageDate | Date of readings | Required |
| IntervalType | Interval data increment. Valid Values are “15”, “30” and “60”. | Required |
| IntervalUsageData | | |
| UsageInterval – Repeated for each interval data increment | | |
| TimePeriod | Time Interval. Valid Values for 60 minute intervals are “0100”, “0200” etc. and Valid Values for 15 minute intervals are “0015”, “0030”, etc. | Required |
| Kwh | Consumption quantity in kwh. Decimal values vary by EDC | Required |
| QuantityQualifier | Quantity Qualifier for kWh reported, repeated for each interval reading. Valid values…  “KA” = Estimated Quantity Delivered  “QD” = Actual Quantity Delivered  “20” = Unavailable (meter data not available for interval)  “87” = Actual Quantity Delivered (Net Metering / Generation)  “9H” = Estimated Quantity Delivered (Net Metering / Generation) | Required |

# StS Historical Interval Usage – Example XML Transactions

## Request Examples

### **Account Level**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageRequest xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<FromDate xsi:nil="2015-03-08" />

<ToDate xsi:nil="2015-03-09" />

<RequestLevel>ACCOUNT</RequestLevel>

</IntervalUsageRequest>

### **Account Level – No Dates**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageRequest xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<FromDate xsi:nil="true" />

<ToDate xsi:nil="true" />

<RequestLevel>ACCOUNT</RequestLevel>

</IntervalUsageRequest>

### **Meter Level**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageRequest xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<FromDate>2015-08-12</FromDate>

<ToDate>2016-08-10</ToDate>

<RequestLevel>METER</RequestLevel>

</IntervalUsageRequest>

### **Meter Level – No Dates**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageRequest xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<FromDate xsi:nil="true" />

<ToDate xsi:nil="true" />

<RequestLevel>METER</RequestLevel>

</IntervalUsageRequest>

## Rejected Response Examples

### **Account Not Found**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<Result>

<StatusCode>A76</StatusCode>

<StatusMessage>Invalid Account</StatusMessage>

</Result>

<AccountInfo>

<CustomerAccountNumber>939884842</CustomerAccountNumber>

</AccountInfo>

</IntervalUsageResponse>

## Response – Account Level Examples

**(Interval readings have been omitted for display purposes, all interval increments must be sent in the actual transaction)**

### **Spring Daylight Savings Time**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<AccountInfo>

<UsageLevel>ACCOUNT</UsageLevel>

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<Demand>17</Demand>

<BillCycle>3</BillCycle>

<LoadProfile>RS</LoadProfile>

<LdcRateCode>RES</LdcRateCode>

<PeakLoadContribution>72</PeakLoadContribution>

<NetworkServicePeakLoad>70</NetworkServicePeakLoad>

<SpecialMeterConfiguration> </SpecialMeterConfiguration>

</AccountInfo>

<AccountLevelUsage>

<Usage>

<UsageDate>2015-11-01</UsageDate>

<IntervalType>60</IntervalType>

<IntervalUsageData>

<UsageInterval>

<TimePeriod>0100</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0200</TimePeriod>

<Kwh></Kwh>

<QuantityQualifier></QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>KA</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2300</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2359</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0200D</TimePeriod>

<Kwh>25</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</AccountLevelUsage>

</IntervalUsageResponse>

### **Fall Daylight Savings Time**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<AccountInfo>

<UsageLevel>ACCOUNT</UsageLevel>

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<Demand>17</Demand>

<BillCycle>3</BillCycle>

<LoadProfile>RS</LoadProfile>

<LdcRateCode>RES</LdcRateCode>

<PeakLoadContribution>72</PeakLoadContribution>

<NetworkServicePeakLoad>70</NetworkServicePeakLoad>

<SpecialMeterConfiguration> </SpecialMeterConfiguration>

</AccountInfo>

<AccountLevelUsage>

<Usage>

<UsageDate>2015-03-13</UsageDate>

<IntervalType>60</IntervalType>

<IntervalUsageData>

<UsageInterval>

<TimePeriod>0100</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0100</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0200</TimePeriod>

<Kwh>23</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0300</TimePeriod>

<Kwh></Kwh>

<QuantityQualifier></QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>KA</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2300</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2359</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</AccountLevelUsage>

</IntervalUsageResponse>

### **Interval Increment Change**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<AccountInfo>

<UsageLevel>ACCOUNT</UsageLevel>

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<Demand>17</Demand>

<BillCycle>3</BillCycle>

<LoadProfile>RS</LoadProfile>

<LdcRateCode>RES</LdcRateCode>

<PeakLoadContribution>72</PeakLoadContribution>

<NetworkServicePeakLoad>70</NetworkServicePeakLoad>

<SpecialMeterConfiguration> </SpecialMeterConfiguration>

</AccountInfo>

<AccountLevelUsage>

<Usage>

<UsageDate>2015-05-20</UsageDate>

<IntervalType>60</IntervalType>

<IntervalUsageData>

<UsageInterval>

<TimePeriod>0100</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

<Usage>

<UsageDate>2015-05-20</UsageDate>

<IntervalType>15</IntervalType>

<IntervalUsageData>

<UsageInterval>

<TimePeriod>0200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0215</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>KA</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2330</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2345</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2359</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</AccountLevelUsage>

</IntervalUsageResponse>

### **Net Metering**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<AccountInfo>

<UsageLevel>ACCOUNT</UsageLevel>

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<Demand>17</Demand>

<BillCycle>3</BillCycle>

<LoadProfile>RS</LoadProfile>

<LdcRateCode>RES</LdcRateCode>

<PeakLoadContribution>72</PeakLoadContribution>

<NetworkServicePeakLoad>70</NetworkServicePeakLoad>

<SpecialMeterConfiguration>ASUN</SpecialMeterConfiguration>

</AccountInfo>

<AccountLevelUsage>

<Usage>

<UsageDate>2015-05-20</UsageDate>

<IntervalType>60</IntervalType>

<IntervalUsageData>

<UsageInterval>

<TimePeriod>0100</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>KA</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>87</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2300</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>87</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2359</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</AccountLevelUsage>

</IntervalUsageResponse>

## Response – Meter Level Examples

**(Interval readings have been omitted for display purposes, all interval increments must be sent in the actual transaction)**

### **Spring Daylight Savings Time**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<AccountInfo>

<UsageLevel>ACCOUNT</UsageLevel>

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<Demand>17</Demand>

<BillCycle>3</BillCycle>

<LoadProfile>RS</LoadProfile>

<LdcRateCode>RES</LdcRateCode>

<PeakLoadContribution>72</PeakLoadContribution>

<NetworkServicePeakLoad>70</NetworkServicePeakLoad>

<SpecialMeterConfiguration>ASUN</SpecialMeterConfiguration>

</AccountInfo>

<AccountLevelUsage>

<Usage>

<UsageDate>2015-05-20</UsageDate>

<IntervalType>60</IntervalType>

<IntervalUsageData>

<UsageInterval>

<TimePeriod>0100</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>KA</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>87</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2300</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>87</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2359</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</AccountLevelUsage>

</IntervalUsageResponse>

### **Fall Daylight Savings Time**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<AccountInfo>

<UsageLevel>METER</UsageLevel>

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<Demand>17</Demand>

<BillCycle>3</BillCycle>

<LoadProfile>RS</LoadProfile>

<LdcRateCode>RES</LdcRateCode>

<PeakLoadContribution>72</PeakLoadContribution>

<NetworkServicePeakLoad>70</NetworkServicePeakLoad>

<SpecialMeterConfiguration> </SpecialMeterConfiguration>

</AccountInfo>

<MeterLevelUsage>

<MeterInfo>

<MeterNumber>9848421</MeterNumber>

<MeterMultiplier>1</MeterMultiplier>

</MeterInfo>

<Usage>

<UsageDate>2015-11-01</UsageDate>

<IntervalType>60</IntervalType>

<IntervalUsageData>

<UsageInterval>

<TimePeriod>0100</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0200</TimePeriod>

<Kwh></Kwh>

<QuantityQualifier></QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>KA</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2300</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2359</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0200D</TimePeriod>

<Kwh>25</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</MeterLevelUsage>

</IntervalUsageResponse>

### **Interval Increment Change**

<?xml version="1.0" encoding="utf-8"?><IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"> <AccountInfo> <UsageLevel>METER</UsageLevel> <CustomerAccountNumber>939884842</CustomerAccountNumber> <Demand>17</Demand> <BillCycle>3</BillCycle> <LoadProfile>RS</LoadProfile> <LdcRateCode>RES</LdcRateCode> <PeakLoadContribution>72</PeakLoadContribution> <NetworkServicePeakLoad>70</NetworkServicePeakLoad> <SpecialMeterConfiguration> </SpecialMeterConfiguration> </AccountInfo> <MeterLevelUsage> <MeterInfo> <MeterNumber>9848421</MeterNumber> <MeterMultiplier>1</MeterMultiplier> </MeterInfo> <Usage> <UsageDate>2015-05-20</UsageDate> <IntervalType>60</IntervalType> <IntervalUsageData> <UsageInterval> <TimePeriod>0100</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>0200</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> </IntervalUsageData> </Usage> <Usage> <UsageDate>2015-05-20</UsageDate> <IntervalType>15</IntervalType> <IntervalUsageData> <UsageInterval> <TimePeriod>0215</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>...</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>KA</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>2330</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>2345</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>2359</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> </IntervalUsageData> </Usage> </MeterLevelUsage></IntervalUsageResponse>

### **Net Metering**

<?xml version="1.0" encoding="utf-8"?><IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"> <AccountInfo> <UsageLevel>METER</UsageLevel> <CustomerAccountNumber>939884842</CustomerAccountNumber> <Demand>17</Demand> <BillCycle>3</BillCycle> <LoadProfile>RS</LoadProfile> <LdcRateCode>RES</LdcRateCode> <PeakLoadContribution>72</PeakLoadContribution> <NetworkServicePeakLoad>70</NetworkServicePeakLoad> <SpecialMeterConfiguration>ASUN</SpecialMeterConfiguration> </AccountInfo> <MeterLevelUsage> <MeterInfo> <MeterNumber>738063</MeterNumber> <MeterMultiplier>1</MeterMultiplier> </MeterInfo> <Usage> <UsageDate>2015-05-20</UsageDate> <IntervalType>60</IntervalType> <IntervalUsageData> <UsageInterval> <TimePeriod>0100</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>0200</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>...</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>KA</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>...</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>2200</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>87</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>2300</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>87</QuantityQualifier> </UsageInterval> <UsageInterval> <TimePeriod>2359</TimePeriod> <Kwh>23.9</Kwh> <QuantityQualifier>QD</QuantityQualifier> </UsageInterval> </IntervalUsageData> </Usage> </MeterLevelUsage></IntervalUsageResponse>

### **Meter Change**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<AccountInfo>

<UsageLevel>METER</UsageLevel>

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<Demand>17</Demand>

<BillCycle>3</BillCycle>

<LoadProfile>RS</LoadProfile>

<LdcRateCode>RES</LdcRateCode>

<PeakLoadContribution>72</PeakLoadContribution>

<NetworkServicePeakLoad>70</NetworkServicePeakLoad>

<SpecialMeterConfiguration> </SpecialMeterConfiguration>

</AccountInfo>

<MeterLevelUsage>

<MeterInfo>

<MeterNumber>9848421</MeterNumber>

<MeterMultiplier>1</MeterMultiplier>

</MeterInfo>

<Usage>

<UsageDate>2015-11-01</UsageDate>

<IntervalType>60</IntervalType>

<IntervalUsageData>

<UsageInterval>

<TimePeriod>0100</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0200</TimePeriod>

<Kwh></Kwh>

<QuantityQualifier></QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>KA</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2300</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2359</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</MeterLevelUsage>

<MeterLevelUsage>

<MeterInfo>

<MeterNumber>8848422</MeterNumber>

<MeterMultiplier>1</MeterMultiplier>

</MeterInfo>

<Usage>

<UsageDate>2015-11-02</UsageDate>

<IntervalType>60</IntervalType>

<IntervalUsageData>

<UsageInterval>

<TimePeriod>0100</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>0200</TimePeriod>

<Kwh>33</Kwh>

<QuantityQualifier></QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>KA</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>...</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2200</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2300</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

<TimePeriod>2359</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</MeterLevelUsage>

</IntervalUsageResponse>

### **Meter Multiplier Change**

<?xml version="1.0" encoding="utf-8"?>

<IntervalUsageResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<AccountInfo>

<UsageLevel>METER</UsageLevel>

<CustomerAccountNumber>939884842</CustomerAccountNumber>

<Demand>17</Demand>

<BillCycle>3</BillCycle>

<LoadProfile>RS</LoadProfile>

<LdcRateCode>RES</LdcRateCode>

<PeakLoadContribution>72</PeakLoadContribution>

<NetworkServicePeakLoad>70</NetworkServicePeakLoad>

<SpecialMeterConfiguration> </SpecialMeterConfiguration>

</AccountInfo>

<MeterLevelUsage>

<MeterInfo>

<MeterNumber>9848421</MeterNumber>

<MeterMultiplier>1</MeterMultiplier>

</MeterInfo>

<Usage>

<UsageDate>2015-11-01</UsageDate>

<IntervalType>60</IntervalType>

<IntervalUsageData>

<UsageInterval>

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<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

<UsageInterval>

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</UsageInterval>

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</UsageInterval>

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<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</MeterLevelUsage>

<MeterLevelUsage>

<MeterInfo>

<MeterNumber>9848421</MeterNumber>

<MeterMultiplier>10</MeterMultiplier>

</MeterInfo>

<Usage>

<UsageDate>2015-11-02</UsageDate>

<IntervalType>60</IntervalType>

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<UsageInterval>

<TimePeriod>0100</TimePeriod>

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<QuantityQualifier>QD</QuantityQualifier>

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</UsageInterval>

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<TimePeriod>2359</TimePeriod>

<Kwh>23.9</Kwh>

<QuantityQualifier>QD</QuantityQualifier>

</UsageInterval>

</IntervalUsageData>

</Usage>

</MeterLevelUsage>

</IntervalUsageResponse>

# StS Historical Interval Usage – WSDL

Notes:

1. Each EDC will publish their individual WSDL and include in their user guide
2. Only one operation is defined as part of the system to system solution.  It is called SYS\_TO\_SYS\_GET\_IU.
3. Note that all of the data types were previously all alliterated in our numerous XML examples.
4. This WSDL indicates a service capable of both SOAP 1.1 and 1.2.  Other EDC’s may not follow suit… choosing to provide either 1.1 only, 1.2 only, or both.
5. This WSDL indicates a location of <http://localhost:9722/WPWG/WPWG_SYS_TO_SYS.asmx> which is not an actual endpoint location.  Each EDC will have a different location.
6. This WSDL indicates a target namespace of <http://wpwg.org/SYS_TO_SYS/Services> which will be PPL’s production namespace.  Each EDC may choose to provide a different target namespace. See the EDC’s user guide documentation for more information.

<wsdl:definitions xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns:wsap="http://schemas.xmlsoap.org/ws/2004/08/addressing/policy" xmlns:wsa10="http://www.w3.org/2005/08/addressing" xmlns:tns="http://tempuri.org/" xmlns:msc="http://schemas.microsoft.com/ws/2005/12/wsdl/contract" xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/" xmlns:wsx="http://schemas.xmlsoap.org/ws/2004/09/mex" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:wsam="http://www.w3.org/2007/05/addressing/metadata" xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing" xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy" xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl" xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/" xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd" xmlns:xsd="http://www.w3.org/2001/XMLSchema" name="Service1" targetNamespace="http://tempuri.org/">

<wsdl:types>

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified" targetNamespace="http://tempuri.org/">

<xs:import namespace="http://schemas.datacontract.org/2004/07/EUWS"/>

<xs:element name="GetAccountLevelIntervalUsage">

<xs:complexType>

<xs:sequence>

<xs:element xmlns:q1="http://schemas.datacontract.org/2004/07/EUWS" minOccurs="0" name="request" nillable="true" type="q1:IntervalUsageRequest"/>

</xs:sequence>

</xs:complexType>

</xs:element>

<xs:element name="GetAccountLevelIntervalUsageResponse">

<xs:complexType>

<xs:sequence>

<xs:element xmlns:q2="http://schemas.datacontract.org/2004/07/EUWS" minOccurs="0" name="GetAccountLevelIntervalUsageResult" nillable="true" type="q2:IntervalUsageResponse"/>

</xs:sequence>

</xs:complexType>

</xs:element>

<xs:element name="GetMeterLevelIntervalUsage">

<xs:complexType>

<xs:sequence>

<xs:element xmlns:q3="http://schemas.datacontract.org/2004/07/EUWS" minOccurs="0" name="request" nillable="true" type="q3:IntervalUsageRequest"/>

</xs:sequence>

</xs:complexType>

</xs:element>

<xs:element name="GetMeterLevelIntervalUsageResponse">

<xs:complexType>

<xs:sequence>

<xs:element xmlns:q4="http://schemas.datacontract.org/2004/07/EUWS" minOccurs="0" name="GetMeterLevelIntervalUsageResult" nillable="true" type="q4:IntervalUsageResponse"/>

</xs:sequence>

</xs:complexType>

</xs:element>

</xs:schema>

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:tns="http://schemas.microsoft.com/2003/10/Serialization/" attributeFormDefault="qualified" elementFormDefault="qualified" targetNamespace="http://schemas.microsoft.com/2003/10/Serialization/">

<xs:element name="anyType" nillable="true" type="xs:anyType"/>

<xs:element name="anyURI" nillable="true" type="xs:anyURI"/>

<xs:element name="base64Binary" nillable="true" type="xs:base64Binary"/>

<xs:element name="boolean" nillable="true" type="xs:boolean"/>

<xs:element name="byte" nillable="true" type="xs:byte"/>

<xs:element name="dateTime" nillable="true" type="xs:dateTime"/>

<xs:element name="decimal" nillable="true" type="xs:decimal"/>

<xs:element name="double" nillable="true" type="xs:double"/>

<xs:element name="float" nillable="true" type="xs:float"/>

<xs:element name="int" nillable="true" type="xs:int"/>

<xs:element name="long" nillable="true" type="xs:long"/>

<xs:element name="QName" nillable="true" type="xs:QName"/>

<xs:element name="short" nillable="true" type="xs:short"/>

<xs:element name="string" nillable="true" type="xs:string"/>

<xs:element name="unsignedByte" nillable="true" type="xs:unsignedByte"/>

<xs:element name="unsignedInt" nillable="true" type="xs:unsignedInt"/>

<xs:element name="unsignedLong" nillable="true" type="xs:unsignedLong"/>

<xs:element name="unsignedShort" nillable="true" type="xs:unsignedShort"/>

<xs:element name="char" nillable="true" type="tns:char"/>

<xs:simpleType name="char">

<xs:restriction base="xs:int"/>

</xs:simpleType>

<xs:element name="duration" nillable="true" type="tns:duration"/>

<xs:simpleType name="duration">

<xs:restriction base="xs:duration">

<xs:pattern value="\-?P(\d\*D)?(T(\d\*H)?(\d\*M)?(\d\*(\.\d\*)?S)?)?"/>

<xs:minInclusive value="-P10675199DT2H48M5.4775808S"/>

<xs:maxInclusive value="P10675199DT2H48M5.4775807S"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="guid" nillable="true" type="tns:guid"/>

<xs:simpleType name="guid">

<xs:restriction base="xs:string">

<xs:pattern value="[\da-fA-F]{8}-[\da-fA-F]{4}-[\da-fA-F]{4}-[\da-fA-F]{4}-[\da-fA-F]{12}"/>

</xs:restriction>

</xs:simpleType>

<xs:attribute name="FactoryType" type="xs:QName"/>

<xs:attribute name="Id" type="xs:ID"/>

<xs:attribute name="Ref" type="xs:IDREF"/>

</xs:schema>

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:tns="http://schemas.datacontract.org/2004/07/EUWS" elementFormDefault="qualified" targetNamespace="http://schemas.datacontract.org/2004/07/EUWS">

<xs:complexType name="IntervalUsageRequest">

<xs:sequence>

<xs:element minOccurs="0" name="CustomerAccountNumber" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="FromDate" nillable="true" type="xs:dateTime"/>

<xs:element minOccurs="0" name="RequestLevel" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="ToDate" nillable="true" type="xs:dateTime"/>

</xs:sequence>

</xs:complexType>

<xs:element name="IntervalUsageRequest" nillable="true" type="tns:IntervalUsageRequest"/>

<xs:complexType name="IntervalUsageResponse">

<xs:sequence>

<xs:element minOccurs="0" name="AccountInfo" nillable="true" type="tns:Account"/>

<xs:element minOccurs="0" name="AccountLevelUsage" nillable="true" type="tns:ArrayOfUsage"/>

<xs:element minOccurs="0" name="MeterLevelUsage" nillable="true" type="tns:ArrayOfMeterLevelUsage"/>

<xs:element minOccurs="0" name="StatusCode" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="StatusMessage" nillable="true" type="xs:string"/>

</xs:sequence>

</xs:complexType>

<xs:element name="IntervalUsageResponse" nillable="true" type="tns:IntervalUsageResponse"/>

<xs:complexType name="Account">

<xs:sequence>

<xs:element minOccurs="0" name="UsageLevel" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="BillCycle" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="CustomerAccountNumber" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="Demand" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="LdcRateCode" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="LoadProfile" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="NetworkServicePeakLoad" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="PeakLoadContribution" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="SpecialMeterConfiguration" nillable="true" type="xs:string"/>

</xs:sequence>

</xs:complexType>

<xs:element name="Account" nillable="true" type="tns:Account"/>

<xs:complexType name="ArrayOfUsage">

<xs:sequence>

<xs:element minOccurs="0" maxOccurs="unbounded" name="Usage" nillable="true" type="tns:Usage"/>

</xs:sequence>

</xs:complexType>

<xs:element name="ArrayOfUsage" nillable="true" type="tns:ArrayOfUsage"/>

<xs:complexType name="Usage">

<xs:sequence>

<xs:element minOccurs="0" name="IntervalType" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="UsageDate" type="xs:dateTime"/>

<xs:element minOccurs="0" name="IntervalUsageData" nillable="true" type="tns:ArrayOfUsageInterval"/>

</xs:sequence>

</xs:complexType>

<xs:element name="Usage" nillable="true" type="tns:Usage"/>

<xs:complexType name="ArrayOfUsageInterval">

<xs:sequence>

<xs:element minOccurs="0" maxOccurs="unbounded" name="UsageInterval" nillable="true" type="tns:UsageInterval"/>

</xs:sequence>

</xs:complexType>

<xs:element name="ArrayOfUsageInterval" nillable="true" type="tns:ArrayOfUsageInterval"/>

<xs:complexType name="UsageInterval">

<xs:sequence>

<xs:element minOccurs="0" name="Kwh" type="xs:double"/>

<xs:element minOccurs="0" name="QuantityQualifier" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="TimePeriod" nillable="true" type="xs:string"/>

</xs:sequence>

</xs:complexType>

<xs:element name="UsageInterval" nillable="true" type="tns:UsageInterval"/>

<xs:complexType name="ArrayOfMeterLevelUsage">

<xs:sequence>

<xs:element minOccurs="0" maxOccurs="unbounded" name="MeterLevelUsage" nillable="true" type="tns:MeterLevelUsage"/>

</xs:sequence>

</xs:complexType>

<xs:element name="ArrayOfMeterLevelUsage" nillable="true" type="tns:ArrayOfMeterLevelUsage"/>

<xs:complexType name="MeterLevelUsage">

<xs:sequence>

<xs:element minOccurs="0" name="MeterInfo" nillable="true" type="tns:Meter"/>

<xs:element minOccurs="0" name="Usages" nillable="true" type="tns:ArrayOfUsage"/>

</xs:sequence>

</xs:complexType>

<xs:element name="MeterLevelUsage" nillable="true" type="tns:MeterLevelUsage"/>

<xs:complexType name="Meter">

<xs:sequence>

<xs:element minOccurs="0" name="MeterMultiplier" nillable="true" type="xs:string"/>

<xs:element minOccurs="0" name="MeterNumber" nillable="true" type="xs:string"/>

</xs:sequence>

</xs:complexType>

<xs:element name="Meter" nillable="true" type="tns:Meter"/>

</xs:schema>

</wsdl:types>

<wsdl:message name="IService1\_GetAccountLevelIntervalUsage\_InputMessage">

<wsdl:part name="parameters" element="tns:GetAccountLevelIntervalUsage"/>

</wsdl:message>

<wsdl:message name="IService1\_GetAccountLevelIntervalUsage\_OutputMessage">

<wsdl:part name="parameters" element="tns:GetAccountLevelIntervalUsageResponse"/>

</wsdl:message>

<wsdl:message name="IService1\_GetMeterLevelIntervalUsage\_InputMessage">

<wsdl:part name="parameters" element="tns:GetMeterLevelIntervalUsage"/>

</wsdl:message>

<wsdl:message name="IService1\_GetMeterLevelIntervalUsage\_OutputMessage">

<wsdl:part name="parameters" element="tns:GetMeterLevelIntervalUsageResponse"/>

</wsdl:message>

<wsdl:portType name="IService1">

<wsdl:operation name="GetAccountLevelIntervalUsage">

<wsdl:input wsaw:Action="http://tempuri.org/IService1/GetAccountLevelIntervalUsage" message="tns:IService1\_GetAccountLevelIntervalUsage\_InputMessage"/>

<wsdl:output wsaw:Action="http://tempuri.org/IService1/GetAccountLevelIntervalUsageResponse" message="tns:IService1\_GetAccountLevelIntervalUsage\_OutputMessage"/>

</wsdl:operation>

<wsdl:operation name="GetMeterLevelIntervalUsage">

<wsdl:input wsaw:Action="http://tempuri.org/IService1/GetMeterLevelIntervalUsage" message="tns:IService1\_GetMeterLevelIntervalUsage\_InputMessage"/>

<wsdl:output wsaw:Action="http://tempuri.org/IService1/GetMeterLevelIntervalUsageResponse" message="tns:IService1\_GetMeterLevelIntervalUsage\_OutputMessage"/>

</wsdl:operation>

</wsdl:portType>

<wsdl:binding name="BasicHttpBinding\_IService1" type="tns:IService1">

<soap:binding transport="http://schemas.xmlsoap.org/soap/http"/>

<wsdl:operation name="GetAccountLevelIntervalUsage">

<soap:operation soapAction="http://tempuri.org/IService1/GetAccountLevelIntervalUsage" style="document"/>

<wsdl:input>

<soap:body use="literal"/>

</wsdl:input>

<wsdl:output>

<soap:body use="literal"/>

</wsdl:output>

</wsdl:operation>

<wsdl:operation name="GetMeterLevelIntervalUsage">

<soap:operation soapAction="http://tempuri.org/IService1/GetMeterLevelIntervalUsage" style="document"/>

<wsdl:input>

<soap:body use="literal"/>

</wsdl:input>

<wsdl:output>

<soap:body use="literal"/>

</wsdl:output>

</wsdl:operation>

</wsdl:binding>

<wsdl:service name="Service1">

<wsdl:port name="BasicHttpBinding\_IService1" binding="tns:BasicHttpBinding\_IService1">

<soap:address location="http://localhost:36602/Service1.svc"/>

</wsdl:port>

</wsdl:service>

</wsdl:definitions>