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Comments on the Smart Grid PAP10 Subcommittee REQ18, Presented to Committee and edited 8/10/2010 dated 8/3/2010.

General Comments:

The data model for the PAP, original titled Energy Usage Information to EMS

<http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/PAP10EnergyUsagetoEMS>

seems to be primarily about access to a metering data, something quite different. The stated first goal of the system is *“This action plan will lead to data standards to exchange fine grained and timely information about energy usage.”* As developed, it seems to require that a premises-based EMS know how to access registers in a meter or meters, and how to access potentially secured registers on each. At the same time, it seems designed to not work with premises-based meters already in use in numerous industrial and commercial sites. It seems oriented only to utility-owned meters.

Several aspects of the data model are not compatible with data aggregation, as in summing multiple systems and meters. By the same token, they are incompatible with disaggregation, as when several facilities or facility zones are supported by a single meter. As such, several of the alternate representations are inimical to the purposes stated in PAP10 for the standard.

The PAP explicitly calls out enabling innovation, yet it seems to embed a single meter and control model in limited use today, and that in the less sophisticated areas (homes). This seems contrary to the PAPs stated purpose, as well as potentially an anti-competitive result forbidden by NAESB processes.

The core of this PAP must be consistent usage information exchange, not consistent access processes to get metering data. As the data model is focused on periodic readings, core formats cannot be applied directly to load curtailment, load shaping, and energy market operations. In none of these, is there a contractual interest in meter readings, only in the net change between meter readings. Again, the initial Plan calls out energy transactions, which is the use of energy over time, and not a series of readings.

Further by building a model around access to meters and meter readings, the proposed model is profoundly inimical to privacy concerns.

The data model on page 13 is a schematic for meter operations and meter readings. It is in no way an interface for sharing usage information.

Recommendation: Adopt the core model proposed during the meeting. Information gathered from the system and operations described in the model on page 13 can be transformed and summed to meet that model. This Page 13 model would then describe one compliant systems without restricting the future development of the proprietary models described.

Detailed comments follow:

Incompatibilities with Stated Requirements

- The model, by including meter readings rather than net usage per interval, fails to meet principle 18.1.1.1.
- Meter readings will inherently be lost when transferring information to any net usage model. This means that any summing, allocation, or projection will not be compliant with 18.1.1.3.
- 18.1.2.1.2 states that usage and load be readily available. The model seems to suggest that they will only be available after querying equipment and computation.
- Premises equipment from HVAC systems to intelligent light-bulbs have their own models for metering, and ones that may not map to the detailed structure of the meter-based model. This will prevent innovation in systems as they will not meet the requirements in 18.1.2.2.2
- Internet like future: 18.1.2.5 calls out systems which share minimal information about each other, and that can be recombined. The meter-reading based model on page 13 does not.
- Meter-reading based models are incompatible with projected load information (18.1.2.9.3)
- Greater or lesser detail (18.1.2.9.5) is only available by exchanging messages that are themselves not in the model on page 13.
- Device usage information (18.1.2.10.2) is not likely to look like meter readings.
- All of section 18.1.2.12 appears to be describing the conclusion, rather than creating requirements.
- **Why is 18.1.2.12.10 part of an information model requirements?**
- 18.1.2.12.13 seems to describe a proprietary process rather than an information model
- 18.1.2.12.14- The model does not uses the OASIS schedule model (or that in the IETF) which specifies either interval (duration) only, or Start time and Duration. The option choosing any two out of three (start, end, duration) The meter was specifically disallowed as causing interoperation problems.
- 18.1.2.12.15: Meter-reading based usage information is incompatible with and maps poorly to Interval Price information.

Incompatibilities with Business Practices

- 18.4.5 (Intra-facilities inter-system communication) These are not likely to be in these meter-reading based models.

Comments on notes on Data Objects (18.4)

- 18.4.1.1 Currency should be a specific call-out to CEFACT currency lists
- 18.4.1.2 Not sure why relevant to customer and load projections
- 18.4.1.3 While Customer is important information for billing, it is not useful for interactions within the building. Including it may present privacy issues
- 18.4.1.4 Including customer contract information may present privacy issues
- 18.4.1.5 DateTimeInterval does not follow PAP04
- 18.4.1.6: Why is EndDeviceEvent part of Energy Usage?
- 18.4.1.8 Interval Data Readings are an implementation detail not an information exchange. Allowing Incremental, Absolute, and Relative data introduces complexity. **Choose one.**
- 18.4.1.10 If meter readings are included, they should match CalConnect recommendation as in PAP04
- 18.4.1.15 ReadingKind appears to be a mix of readings, computations and lookups from elsewhere (CO₂, NO_X). Are we really proposing that meters in the building will measure NO_X et al.?
- 18.4.1.17 channelNumber? defaultQuality? Kind? These are all useful application variables but do not belong in an exchange / interface model.
- 18.4.1.20: Not sure where this fits in Energy Usage information exchange
- 18.4.1.21 Device status is useful control system information but not part of an energy usage exchange
- 18.4.1.23: Unless the TariffProfile data structure is demonstrated to work and has a public, accessible, provable computation engine to go with it, then this should not be part of energy usage exchange. If included, should also include mechanism for generating internal tariffs, for site based generation, energy recycling, non-traditional energy generation, etc.
- 18.4.1.24: Recommend compliance with CEFACT
- 18.4.1.25: Units: Should be compliance with CEFACT and restriction to actual energy usage relevant variables.
- 18.4.1.26: Should be generalized to allow non-standard intervals. Very useful for building system information.
- 18.4.1.27. ServiceKind should be restricted to Energy, or at least to measurable time variable delivery. Time? Refuse? tvLicense? Internet?
- 18.4.1.28 Customer Authorization, while critical to OpenADE, is not part of core usage model.

Comments on Technical Consideration

- 18.4.3.3 (Subsetting) Model should be restricted to a single representation when a single set of facts is used. Examples are exchanging meter readings in the past and project load in the future.
- 18.4.3.9 (Required Core model)
 - Pick single representation of interval (Start time, duration) compatible with WS-Calendar
 - Reading Types should be conformed to use a single multiplier within a given exchange
 - Not all readings, such as those anticipated in PAP17, will have ServicePointDelivery.id

Going through the validation elements and applying them to the model on page 13 would generate similar comments to those above.