1 Conformance and Processing Rules for Energy Interoperation

1.1 Conformance with the Semantic Models of EMIX and WS-Calendar

This section specifies conformance with the semantic models of **[EMIX]** and **[WS-Calendar]**. Energy Interoperation is strongly dependent on each of these information models.

[WS-Calendar] is a general specification and makes no assumptions about how its information model is used. **[WS-Calendar]** has specific rules which define Inheritance as a means to reduce the transmission of repetitive information. As this specification constrains schedule communications to specific business interactions, these inheritance rules are extended to embrace rules of interaction and rules of process that further reduce the information that must be expressed in each interval.

Implementations of Energy Interoperation SHALL follow **[WS-Calendar]** and **[EMIX]** Conformance rules. These rules include the following conformance types:

- Conformance to the ***inheritance rules*** in **[WS-Calendar]**, including the direction of inheritance
- ***Specific attributes*** for each type that MUST or MUST NOT be inherited.
- ***Conformance rules*** that Referencing Specifications MUST follow
- Description of ***Covarying attributes*** with respect to the Reference Specification
- ***Semantic Conformance*** for the information within the Artifacts exchanged.
- Conformance to the ***inheritance rules*** in **[EMIX]**, including inheritance of Product Definitions and Standard Terms.

Energy Interoperation implementations also use the EMIX Products and Resources also extend the Inheritance patterns of **[WS-Calendar]** as specified in the EMIX information model. We address each of these in the following sections.

1.1.1 Recapitulation of Requirements from WS-Calendar and EMIX

[WS-Calendar] uses the term Sequence to refer to one or more Intervals with Temporal Relations defined between them that may inherit from zero or more Gluons. **[EMIX]** introduced the term Schedule to refer to Product Descriptions applied to a Sequence.

1.1.1.1 Specific Attribute Inheritance within Schedules

The rules that define inheritance, including direction in **[WS-Calendar]**, are recapitulated.

I1: Proximity Rule Within a given lineage, inheritance is evaluated though each Parent to the Child before what the Child bequeaths is evaluated.

I2: Direction Rule Intervals MAY inherit attributes from the nearest Gluon subject to the Proximity Rule and Override Rule, provided those attributes are defined as Inheritable.

I3: Override Rule If and only if there is no value for a given attribute of a Gluon or Interval, that Gluon or Interval SHALL inherit the value for that attribute from its nearest Ancestor in conformance to the Proximity Rule.

I4: Comparison Rule Two Sequences are equivalent if a comparison of the respective Intervals succeeds as if each Sequence were fully Bound and redundant Gluons are removed.

I5: Designated Interval Inheritance [To facilitate composition of Sequences] the Designated Interval in the ultimate Ancestor of a Gluon is the Designated Interval of the composed Sequence. Special conformance rules for Designated Intervals apply only to the Interval linked from the Designator Gluon.

I6: Start Time Inheritance When a start time is specified through inheritance, that start time is inherited only by the Designated Interval; the start time of all other Intervals are computed through the durations and temporal; relationships within the Sequence. The designated Interval is the Interval whose parent is at the end of the lineage.

1.1.1.2 Time Zone Specification

The time zone MUST be explicitly expressed in any conforming EMIX Artifact.

This may be accomplished in two ways:

- The time, date, or date and time MUST be specified using **[ISO8601]** utc-time (also called *zulu time*)
- The **[WS-Calendar]** Time Zone Identifier, TZID, MUST be in the Lineage of the artifact, as extended by the Standard Terms. See **Error! Reference source not found.** below.

If neither expression is included, the Artifact does not conform to this specification and its attempted use in information exchanges MUST result in an error condition.

1.1.1.3 Specific Rules for Optimizing Inheritance

If the Designated Interval in a Series has a Price only, all Intervals in the Sequence have a Price only and there is no Price in the Product.

1. If the Designated Interval in a Series has a Quantity only, all Intervals in the Sequence have a Quantity only and there is no quantity in the Product.
2. If the Designated Interval in a Series has a Price & Quantity, all Intervals in the Sequence MUST have a Price and Quantity and there is neither Price not Quantity in the Product.

1.1.2 Inheritance within Events

For purposes of processing, inheritance, and conformance, Signal Information is treated as an **[EMIX]** Product Description, applied to a Sequence, and the Event Base and a Sequence are considered as an **[EMIX]** Schedule.

Signals within an Event arrive in a setting established by a Market Context. Within an event, there may be multiple Signal types. For purposes of inheritance, An Event may include multiple Event Base derived information elements each with an associated Schedule. For purposes of processing, the Event Base is treated as a [WS-Calendar Gluon], and the Signal Information in each Interval in the Sequence inherits from the Event Base.

Each Event Base specifies a Market Context. If that Market Context is associated with Standard Terms, then those Terms enter the Lineage of the Schedule and are inherited by each Interval. Standard Terms associated with a Market Context enter the Lineage of the Schedule as if the Standard Terms were a Gluon. Product Description, TZID, Program Definition, Terms, et al. can be inherited in this way.

1.1.2.1 Sequence Optimization within Events

WS-Calendar specifies that each Interval have a unique identifier (UID). WS-Calendar further specifies that each Interval include a Temporal Relation, either direct or transitive, with all other Intervals in a Sequence. A Temporal Relation consists of the Relationship, the UID of the related Interval, and the optional Gap between Intervals.

Within a Market Signal, the UID for each Interval is constructed by concatenating the Signal Identifier, the account identifier (which includes the VEN Party ID), and a sequence number. Within a single Market Signal, this UID can be expressed within each interval by the sequence number alone.

Many Sequences communicated within a Market Signal consist of consecutive intervals without an intervening Gap, which **[WS-Calendar]** terms a Partition. If the Designated Interval in a Sequence within a Market Signal omits a Temporal Relationship, then no Intervals in the Sequence MAY have a Temporal Relation. Such intervals are sorted by increasing Sequence number (expressed in the UID), and each Interval contains an implied FinishToStart relation to the next Interval with a Gap of zero duration.

Partitions expressed in this way contain only a Sequence Number, the Duration of the Interval, and the Market Signal Payload. The effect of this is that Event Intervals are ordered as a Partition in order of increasing sequence.