Introduction:

**WEQ-XXX-1** A System Operator’s Governing Documents shall specify the attributes defining the grid services offered within its market.

**WEQ-XXX-1.1** Attributes to define a grid service shall include but are not limited to electrical attributes, timing attributes, and performance determinations.

**WEQ-XXX-2 Energy Service**

WEQ-XXX-2.1 Energy Services may require a resource to adjust supply or demand to make energy available at an electrical service location over a specified period.

WEQ-XXX-2.2 The Governing Documents shall specify the electrical attributes for Energy Service, if offered. Factors used to define the electrical attributes shall include but are not limited to:

WEQ-XXX-2.2.1 The quantity of electric energy, expressed as electrical energy units such as megawatt hours or kilowatt hours over the performance period. A service agreement for Energy Service can specify the price for a quantity of energy at different power levels (a curve).

WEQ-XXX-2.2.2 The required power level of the resource expressed as electrical power units, such as megawatts or kilowatts over the performance period.

WEQ-XXX-2.2.3 The electrical location where the service is provided to the electric system.

WEQ-XXX-2.3 The Governing Documents shall specify the timing attributes for Energy Service, if offered. Factors used to define the timing attributes shall include but are not limited to:

WEQ-XXX-2.3.1 The delivery schedule, represented by the start time and end time to perform the service or a start time and length of duration.

WEQ-XXX-2.3.2 The timing associated with the notification that the delivery for the Energy Service is established. This may be conveyed through a delivery schedule notification that is publication of the results of a market process, published by specified times, to notify the market participant of its scheduled delivery of the service.

WEQ-XXX-2.4 The Governing Documents shall specify performance determinations, including how performance is quantified, and shall include measurement equipment and location, measurement units and frequency, and calculations of estimating methods.

WEQ-XXX-2.4.1 Factors used to define the performance quantifications may include but are not limited to:

WEQ-XXX-2.4.1.1 Revenue grade meters that measure energy intervals synchronized to the delivery schedule for the Energy Service.

WEQ-XXX-2.4.1.2 Periodic power measurements to estimate energy over the performance period.

WEQ-XXX-2.4.2 In performance determinations, measurement of the electrical location may be different from the measurement location, and correction factors may be applied to address discrepancies between the delivery point and measurement point.

WEQ-XXX-2.4.3 The electrical location may be related to a pricing node or zone for settlement computations.

**WEQ-XXX-3 Reserve Service**

WEQ-XXX-3.1 Reserve Service may require a resource to produce or consume energy at an electrical location when called upon over a specified period.

WEQ-XXX-3.2 A resource shall be capable of providing a Reserve Service if the resource can meet performance expectations as described by a System Operator’s Governing Documents.

WEQ-XXX-3.2.1 A resource may meet performance expectations for Reservice Service by producing and/or consuming energy.

WEQ-XXX-3.2 The Governing Documents shall specify the electric attributes for Reserve Service, if offered. Factors used to define the electrical attributes shall include but are not limited to:

WEQ-XXX-3.2.1 The quantity of electric energy, expressed as electrical energy units such as megawatt hours or kilowatt hours, held in reserve which could be called upon over the performance period. A service agreement for Reserve Service can specify the quantity of energy as different power levels (a curve) that will be called upon.

WEQ-XXX-3.2.2 The required power level power level of the resource expressed as electric power units such as megawatts or kilowatts over the performance period.

WEQ-XXX-3.2.3 The electrical location where the service is provided to the electric system.

WEQ-XXX-2.3 The Governing Documents shall specify timing attributes. Factors used to define the timing attributes shall include but are not limited to:

WEQ-XXX-2.3.1 The delivery schedule or the start and end time to perform the service. This can also be specified with a start time and a duration. The Governing Documents specify the periodicity of the scheduling agreement (e.g. daily, hourly, 30-minute periods).

WEQ-XXX-2.3.2 Delivery schedule notification is the timing associated with notification that the delivery schedule for the Reserve Service is established. For example, the results of a market process are published by specified times and notify the market participant of their scheduled delivery of the service.

WEQ-XXX-2.3.3 Speed of response is the quality of the resource to change its operating position over a time interval. This can be measured in the amount of time to have the resource available (e.g. 30 minutes), the power level, a percent of reserved power level quantity per unit, and/or an agreed quantity over an interval.

WEQ-XXX-2.4 The Governing Documents shall specify shall specify performance determinations, including how performance is measured and can combine energy interval metering with time stamped power measurements.

**WEQ-XXX-4 Regulation Service**

WEQ-XXX-4.1 Regulation Service may require a resource to provide an increase or decrease in real power from an electrical location over a specified scheduled period against a predefined real-power basepoint following a signal provided by the service requestor.

WEQ-XXX-4.1.1 A resource providing Regulation Service must be able to respond to regulation signals sent by the service requestor.

WEQ-XXX-4.1.1.1 The signal interval from a service requestor for Regulation Service may be one to several seconds and the associated performance period is of a shorter duration than the typical energy schedule service performance period.

WEQ-XXX-4.2 The Governing Documents shall specify the electrical attributes for Regulation Service, if offered. Factors used to define the electrical attributes shall include but are not limited:

WEQ-XXX-4.2.1 The amount of real power change required from the resource expressed as electrical power units, such as megawatts or kilowatts, for increase and decrease over the signal performance period.

WEQ-XXX-4.2.2 The power regulation range, which specifies the required upper and/or lower bound for the change in power level in electric power units, such as megawatts of kilowatts, expected over the service period.

WEQ-XXX-4.2.3 The power mileage, or the summation of power level movements up and down that a resource providing regulation service must take over the course of the delivery schedule

WEQ-XXX-4.2.4 The location or region where the service is delivered in the electric system.

WEQ-XXX-4.2.4.1 The location or region for service delivery can be represented by a zone or area of the system.

WEQ-XXX-4.3 The Governing Documents shall specify timing attributes. Factors used to define the timing attributes shall include but are not limited to:

WEQ-XXX-4.3.1 The delivery schedule or the start and end time to perform the service. The delivery schedule may be specified with a start time and a duration (e.g., 1 hour or 4-hour periods).

WEQ-XXX-4.3.2 The timing associated with notification of the delivery schedule for the Regulation Service and can be known as the delivery schedule notification. For example, the results of a market process are published by specified times and notify the market participant of their scheduled delivery of the service.

WEQ-XXX-4.3.3 The signal periodicity, or the periodicity of the regulation signal (e.g. 2 or 4 seconds).

WEQ-XXX-4.3.4 The speed of response required for the resource. This may be expressed as the quality of the resource to changes its operating position over the signal period.

WEQ-XXX-4.4 The Governing Documents shall specify performance determinations, including how a real power increase or decrease will be measured.

WEQ-XXX-4.4.1 Regulation service may be metered by reporting real power change in each time step to follow the power up/down movement responding to the regulation signal and is bounded by the power regulation range committed by the service provider.

WEQ-XXX-4.4.2 A performance score or performance index may be metrics used to measure the ability of a resource to closely follow the accuracy of the response. The performance score or performance index may be represented as a unit-less quantity between 0 and 1 or an accuracy percentage between 0 and 100.

WEQ-XXX-4.4.2.1 The Governing Documents shall specify the calculation method for the performance score metric. The calculation period may be for each real-time market interval (e.g. 5 minutes or 15 minutes).

WEQ-XXX-4.4.2.1.1 A resource’s average performance score over a certain period may be used to determine the service provider’s qualification for service and performance payment.

**WEQ-XXX-5 Frequency Response Service**

WEQ-XXX-5.1 Frequency Response Service may require a resource to provide active response of a resource based on locally measured or sensed changes in frequency

WEQ-XXX-5.1 The Governing Documents shall specify the electrical attributes for Frequency Response Service, if offered. Factors used to define the electrical attributes shall include but are not limited:

WEQ-XXX-5.1.1 The percent droop or the amount of real power change for an increase or decrease of frequency over the performance period as expressed in units such as percent of megawatt per one tenth Hertz.

WEQ-XXX-5.1.2 The deadband or the upper and/or lower frequency deviation threshold. This attribute may be expressed in units such as Hertz, around nominal system frequency within which the resource will not perform frequency response and beyond which the resource will operate to correct a deviation.

WEQ-XXX-5.1.3 The location or region where the service is delivered in the electric system, typically the Balancing Area.

WEQ-XXX-5.2 The Governing Documents shall specify timing attributes. Factors used to define the timing attributes shall include but are not limited to:

WEQ-XXX-5.2.1 The delivery schedule or the start and end time to perform the service. The delivery schedule may be specified with a start time and a duration (e.g., 1 hour or 4-hour periods).

WEQ-XXX-.5.2.2 The timing associated with the notification of the on-call schedule for the frequency response and can be known as the delivery schedule notification.

WEQ-XXX-5.3 The Governing Documents shall specify performance determinations, including frequency response measurements

WEQ-XXX-5.3.1 Frequency response measures may be established using a fixed time interval to determine initial response to a frequency deviation event.

WEQ-XXX-5.3.2 Sustained frequency response may be used to establish an additional fixed interval that may be used to determine if frequency response is being sustained as desired.

**WEQ-XXX-6 Voltage Management Service**

WEQ-XXX-6.1 Voltage Management Services may require a resource to provide voltage support (raise or lower) within a specified upper and lower voltage range at an electrical location over a specified scheduled period

WEQ-XXX-6.2 The Governing Documents shall specify the electrical attributes for Frequency Response Service, if offered. Factors used to define the electrical attributes shall include but are not limited:

WEQ-XXX-6.2.1 The target voltage for the service which can be expressed as electrical voltage units such as kilovolts at the electrical service location over a performance period.

WEQ-XXX-6.2.1.1 A Voltage Management Service agreement may specify a single target or an upper and lower range of voltage magnitude or an RMS value at the service location.

WEQ-XXX-6.2.2 The location or region where the service is delivered in the electric system.

WEQ-XXX-6.3 The Governing Documents shall specify timing attributes. Factors used to define the timing attributes shall include but are not limited to:

WEQ-XXX-6.3.1 The delivery schedule or the start and end time to perform the service. The delivery schedule may be specified with a start time and a duration (e.g., 1 hour or 4-hour periods).

WEQ-XXX-6.3.2 The timing associated with notification that the delivery schedule for the Voltage Management Service is established. For example, the results of a market process are published by specified times and notify the market participant of their scheduled delivery of the service.

WEQ-XXX-6.4 The Governing Documents shall specify performance determinations, including how performance is measured.

**WEQ-XXX-7 Emergency or Black Start Service**

WEQ-XXX-7.1 Emergency or Black Start Service may require a resource to energize without an outside electrical supply or quickly change energization levels during an electric grid emergency.

WEQ-XXX-7.2 The Governing Documents shall specify the electrical attributes for Emergency or Black Start Service, if offered. Factors used to define the electrical attributes shall include but are not limited:

WEQ-XXX-7.2.1 The amount of real power change required from a resource. This value may be expressed in electrical power units such as megawatts or kilowatts for increase or decrease over the signal performance period.

WEQ-XXX-7.2.2 The upper and/or lower bound for the change in power level in electrical power units such as megawatts or kilowatts expected over the service period.

WEQ-XXX-7.2.3 The location or region where the service is delivered in the electric system.

WEQ-XXX-7.2.3.1 The location or region for service delivery can be represented by a zone or area of the system.

WEQ-XXX-7.3 The Governing Documents shall specify timing attributes. Factors used to define the timing attributes shall include but are not limited to:

WEQ-XXX-7.3.1 The delivery schedule or the start and end time to perform the service. The delivery schedule may be specified with a start time and a duration (e.g., 1 hour or 4-hour periods).

WEQ-XXX-7.3.2 The timing associated with notification that the delivery schedule for the Emergency or Black Start Service is established. For example, the results of a market process are published by specified times and notify the market participant of their scheduled delivery of the service.

WEQ-XXX-7.3.3 The required speed of response or the quality of the resource to change its operating position over the signal period.

WEQ-XXX-7.4 The Governing Documents shall specify performance determinations, including how performance is measured.

WEQ-XXX-7.4.1 Performance may be measured through the use of interval meters capable of recording energy flow at intervals that match the timing attributes as identified in the Governing Documents.