

Untitled ICCP Data Formatting and Naming Requirements Document

**Version 0.1**

Protocol Disclaimer

This document describes ERCOT Systems and the response of these systems to Market Participant submissions incidental to the conduct of operations in the ERCOT Texas Nodal Market and is not intended to be a substitute for the ERCOT Nodal Protocols (available at http://www.ercot.com/mktrules/nprotocols/current), as amended from time to time. If any conflict exists between this document and the ERCOT Nodal Protocols, the ERCOT Nodal Protocols shall control in all respects.

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Introduction

This document outlines data formatting and nomenclature standards for the transfer of information via Inter-Control Center Communications Protocol (ICCP) through the ERCOT Wide Area Network (WAN) as referenced in Nodal Operating Guide Section 7.2, ERCOT ICCP Interface, Section 7.3, Telemetry, and the ERCOT Nodal Protocols.

Change Control Process

The Network Data Support Working Group (NDSWG) is responsible for maintaining and updating the “*Untitled ICCP Data Formatting and Nomenclature Requirements Document”*. Changes to this document shall be reviewed by the NDSWG and Reliability and Operations Subcommittee (ROS) prior to approval by the Technical Advisory Committee (TAC).

In the following cases, after review and recommendation by TAC, revisions to this document must be approved by the ERCOT Board:

a. The revisions require an ERCOT project for implementation; and

b. The revisions are related to a Nodal Protocol Revision Request (NPRR), a Nodal Operating Guide Revision Request (NOGRR), or other revision request requiring an ERCOT project for implementation.

Upon approval of revisions, ERCOT shall post the revised document to the ERCOT website within three Business Days.

Quality Code Definitions

Tables 6 through 9 describe in detail the conditions under which Market Participants shall set the various ICCP Data Object attributes for status indications and measured values sent to ERCOT. Each table discusses the attribute requirements for a different *Normal Source*. In a similar way Table 10 through Table 13 specifies the circumstances under which ERCOT sets ICCP Data Object attributes for status indications and measured values sent to Market Participants. For additional information...

#### ICCP Quality Codes from Market Participants to ERCOT

Table 6 ICCP Attributes for Telemetered Points from Market Participants to ERCOT

| ICCP Quality Class | ICCP Attribute value to be sent from Market Participant to ERCOT | Condition under which ICCP Attribute value is to be sent to ERCOT. |
| --- | --- | --- |
| Validity | VALID | The measured value or status indication is valid and can be trusted by ERCOT. |
| HELD | Point has been taken off scan by the Market Participant or otherwise removed from service. The value or status indication associated with this ICCP quality code must be the last good value obtained by the Market Participant, or a value that has been substituted by the Operator (see Current Source / MANUAL) below. ERCOT expects that when the Market Participant’s Operator manually enters a value or state, the point is also taken off scan. |
| SUSPECT | Any of the following: old value or state due to telemetry failure or failure to acquire a new value within the specified scan time (stale), considered suspect by the data owner, or otherwise should not be considered by ERCOT to be current. The measured value or status indication associated with this ICCP quality code must be the last good value obtained by the Market Participant. |
| NOT\_VALID | The measured value or status indication is invalid due to data acquisition/conversion errors or the initial value has never been established. The measured value or status indication associated with this ICCP quality code must be the last good value obtained by the Market Participant. If the measured value or status indication has never been initialized, the value or status indication associated with this quality code must be a predefined default value. |
| Current Source | TELEMETERED | The measured value or status indication was acquired from a field device, which is the normal source of this value or status indication. |
| CALCULATED | Although the measured value or status indication is normally acquired from a field device, it has been replaced by a calculated value. |
| MANUAL | Although the measured value or status indication is normally acquired from a field device, it has been replaced by the Market Participant’s Operator. |
| ESTIMATED | Although the value or status indication is normally acquired from a field device, it has been replaced by the Market Participant’s State Estimator. |
| Normal Value | NORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| ABNORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| COVClass = COV | COVCounter > 0 | Number of state changes that occurred between acquisitions of a status point. Use of COV is optional. As an alternative, each state change can be sent to ERCOT without the COV attribute (COVClass = NOCOV) |

Table 7 ICCP Attributes for Calculated Points from Market Participants to ERCOT

| ICCP Quality Class | ICCP Attribute value to be sent from Market Participant to ERCOT | Condition under which ICCP Attribute value is to be sent to ERCOT. |
| --- | --- | --- |
| Validity | VALID | The value or status indication is valid and can be trusted by ERCOT. |
| HELD | Must be set if any of the points on which the calculated value is based have been taken off scan by the Market Participant or otherwise removed from service. |
| SUSPECT | Must be set if any of the points on which the calculated value is based are any of the following: old value or state due to telemetry failure or failure to acquire a new value within the specified scan time (stale), considered suspect by the data owner, or otherwise should not be considered by ERCOT to be current. |
| NOT\_VALID | Must be set if any of the points on which the calculated value is based is invalid due to data acquisition/conversion errors or the initial value has never been established. NOT\_VALID may also be set if the calculation processor has not yet populated this point with a value. In this case, the value or status indication associated with this quality code must be a predefined default value. |
| Current Source | TELEMETERED | See . ERCOT does not anticipate a condition where a calculated point would be replaced with a telemetered value or status indication. |
| CALCULATED | The *Validity* attribute is processed as discussed above. No additional processing is applied. |
| MANUAL | The *Validity* attribute is processed as discussed above. The point will also be considered as Manually Replaced by the Operator. |
| ESTIMATED | ERCOT does not anticipate a condition where a normally calculated value would be replaced by the State Estimator. |
| Normal Value | NORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| ABNORMAL | For status indications, the state reported is considered to be abnormal. For other data types, the Normal Value attribute has no meaning. |
| COVClass = COV | COVCounter > 0 | Number of state changes that occurred between acquisitions of a status point. Use of COV is optional. As an alternative, each state change can be sent to ERCOT without the COV attribute (COVClass = NOCOV) |

Table 8 ICCP Attributes for Manually Entered Points from Market Participants to ERCOT

| ICCP Quality Class | ICCP Attribute value to be sent from Market Participant to ERCOT | Condition under which ICCP Attribute value is to be sent to ERCOT. |
| --- | --- | --- |
| Validity | VALID | The value or status indication is valid and can be trusted by ERCOT. |
| HELD | HELD is never set when the Normal Source is also MANUAL. |
| SUSPECT | SUSPECT is never set. |
| NOT\_VALID | When an Operator enters a value, NOT\_VALID is never set. However, if NOT\_VALID is received by ERCOT for a normally Operator Entered value or status indication, ERCOT will interpret this to mean that the Operator has not yet entered a value for this point. |
| Current Source | TELEMETERED | ERCOT does not anticipate a condition where a normally Operator entered value would be replaced with a telemetered value or status indication. However, if the Market Participant reports the *Current Source* as TELEMETERED, ERCOT will consider the *Current Source* as MANUAL. |
| CALCULATED | ERCOT does not anticipate a condition where a normally Operator Entered value would be replaced by an output of the calculation processor. |
| MANUAL | The *Validity* attribute is processed as discussed above. No additional processing is applied. |
| ESTIMATED | ERCOT does not anticipate a condition where a normally Operator-entered value would be replaced by the State Estimator. |
| Normal Source |  | The ICCP attribute *Normal Source* is not processed by ERCOT. The Normal Source of a point is configured locally in the ERCOT real-time SCADA database. |
| Normal Value | NORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| ABNORMAL | For status indications, the state reported is considered to be abnormal. For other data types, the Normal Value attribute has no meaning. |
| COVClass = COV | COVCounter > 0 | Number of state changes that occurred between acquisitions of a status point. Use of COV is optional. As an alternative, each state change can be sent to ERCOT without the COV attribute (COVClass = NOCOV) |

Table 9 ICCP Attributes for State Estimated Points from Market Participants to ERCOT

| ICCP Quality Class | ICCP Attribute value to be sent from Market Participant to ERCOT | Condition under which ICCP Attribute value is to be sent to ERCOT. |
| --- | --- | --- |
| Validity | VALID | The value or status indication is valid and can be trusted by ERCOT. |
| HELD | Indicates that the Operator or other process has prevented the State Estimator from populating this point. |
| SUSPECT | The State Estimator normally would not set SUSPECT. However, if a Market Participant’s system sends the SUSPECT quality, ERCOT will interpret this as meaning that the Market Participant’s State Estimator failed to produce a result that can be trusted by ERCOT. The value or status indication associated with this point should be the last good value produced by the State Estimator. |
| NOT\_VALID | The Market Participant’s State Estimator is not expected to set NOT\_VALID. However, if a Market Participant’s system sends the NOT\_VALID quality, ERCOT will interpret this as meaning that the Market Participant’s State Estimator has not yet populated this point with a resultant value or status indication. In this case, the value or status indication associated with this quality code must be a predefined default value. |
| Current Source | TELEMETERED | ERCOT does not anticipate a condition where a normally State Estimated point would be replaced with a telemetered value or status indication. |
| CALCULATED | ERCOT does not anticipate a condition where a normally State Estimated value would be replaced by an output of the calculation processor. |
| MANUAL | The *Validity* attribute is processed as discussed above. The point will also be considered as Manually Replaced by the Operator. |
| ESTIMATED | The *Validity* attribute is processed as discussed above. No additional processing is applied. |
| Normal Value | NORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| ABNORMAL | For status indications, the state reported is considered to be abnormal. For other data types, the Normal Value attribute has no meaning. |
| COVClass = COV | COVCounter > 0 | Number of state changes that occurred between acquisitions of a status point. Use of COV is optional. As an alternative, each state change can be sent to ERCOT without the COV attribute (COVClass = NOCOV) |

#### ICCP Quality Codes from ERCOT to Market Participants

Table 10 ICCP Attributes for Telemetered Points from ERCOT to Market Participants

| ICCP Quality Class | ICCP Attribute value to be sent from Market Participant to ERCOT | Condition under which ICCP Attribute value is to be sent to ERCOT. |
| --- | --- | --- |
| Validity | VALID | The measured value or status indication is valid and can be trusted by the Market Participant. |
| HELD | Indicates that the related point has been removed from scan by ERCOT. |
| SUSPECT | The measured value or status indication is OLD (stale) because it has been removed from scan either by ERCOT or the data provider. The measured value or status indication may also have been received from the data provider in any of the following conditions: old due to telemetry failure or failure to acquire a new value within the specified scan time (stale). The measured value or status indication associated with this ICCP quality code will be the last good value obtained by the ERCOT. |
| NOT\_VALID | The measured value or status indication is invalid due to data acquisition/conversion errors experienced by the data provider or the initial value has never been established. The measured value or status indication associated with this ICCP quality code will be the last good value obtained by the data provider. If the measured value or status indication has never been initialized, the value or status indication associated with this quality code will be a predefined default value. |
| Current Source | TELEMETERED | Always set. |
| Normal Value | NORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| ABNORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| COVClass = COV | COVCounter > 0 | Number of state changes that occurred between acquisitions of a status point. Use of COV is optional. As an alternative, each state change can be sent to ERCOT without the COV attribute (COVClass = NOCOV) |

Table 11 ICCP Attributes for Calculated Points from ERCOT to Market Participants

| ICCP Quality Class | ICCP Attribute value to be sent from Market Participant to ERCOT | Condition under which ICCP Attribute value is to be sent to ERCOT. |
| --- | --- | --- |
| Validity | VALID | The value or status indication is valid and can be trusted by Market Participant. |
| HELD | The point has been inhibited from being updated by the calculation processor. |
| SUSPECT | Set if any of the points on which the calculated value is based SUSPECT. |
| NOT\_VALID | Set if any of the points on which the calculated value is based are NOT\_VALID. NOT\_VALID may also be set if the calculation processor has not yet populated this point with a value. In this case, the value or status indication associated with this quality code will be a predefined default value. |
| Current Source | CALCULATED | Always set. |
| Normal Value | NORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| ABNORMAL | For status indications, the state reported is considered to be abnormal. For other data types, the Normal Value attribute has no meaning. |
| COVClass = COV | COVCounter > 0 | Number of state changes that occurred between acquisitions of a status point. Use of COV is optional. As an alternative, each state change can be sent to ERCOT without the COV attribute (COVClass = NOCOV) |

Table 12 ICCP Attributes for Manually Entered Points from ERCOT to Market Participants

| ICCP Quality Class | ICCP Attribute value to be sent from Market Participant to ERCOT | Condition under which ICCP Attribute value is to be sent to ERCOT. |
| --- | --- | --- |
| Validity | VALID | The value or status indication is valid and can be trusted by Market Participant. |
| HELD | Never set. |
| SUSPECT | Never set. |
| NOT\_VALID | When an Operator enters a value, NOT\_VALID is never set. However, if NOT\_VALID is received by ERCOT from a data provider, ERCOT will interpret this to mean that the data provider’s Operator has not yet entered a value for this point. Points that are normally entered by the ERCOT Operator will also produce NOT\_VALID if the ERCOT Operator has not yet entered a value for the point. |
| Current Source | MANUAL | Always set. |
| Normal Value | NORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| ABNORMAL | For status indications, the state reported is considered to be abnormal. For other data types, the Normal Value attribute has no meaning. |
| COVClass = COV | COVCounter > 0 | Number of state changes that occurred between acquisitions of a status point. Use of COV is optional. As an alternative, each state change can be sent to ERCOT without the COV attribute (COVClass = NOCOV) |

Table 13 ICCP Attributes for State Estimated Points from ERCOT to Market Participants

| ICCP Quality Class | ICCP Attribute value to be sent from Market Participant to ERCOT | Condition under which ICCP Attribute value is to be sent to ERCOT. |
| --- | --- | --- |
| Validity | VALID | The value or status indication is valid and can be trusted by Market Participant. |
| HELD | Indicates that the related point has been inhibited from being updated by the State Estimator. |
| SUSPECT | The State Estimator normally would not set SUSPECT. However, if a data provider’s system sets the SUSPECT quality, ERCOT will interpret this quality code as meaning that the Market Participant’s State Estimator failed to produce a result that can be trusted by ERCOT. ERCOT will pass SUSPECT to the receiving Market Participant along with the last good value produced by the data provider’s State Estimator. |
| NOT\_VALID | Neither the data provider’s nor ERCOT’s State Estimator is expected to set NOT\_VALID. However, if a data provider’s system sets NOT\_VALID, ERCOT will interpret this quality code as meaning that the data provider’s State Estimator has not yet populated this point with a resultant value or status indication. ERCOT will also produce NOT\_VALID if ERCOT’s State Estimator has not yet populated this point with a resultant value. In this case, the value or status indication associated with this quality code will be a predefined default value. |
| Current Source | ESTIMATED | Always set. |
| Normal Value | NORMAL | For status indications, the state reported is considered to be normal. For other data types, the Normal Value attribute has no meaning. |
| ABNORMAL | For status indications, the state reported is considered to be abnormal. For other data types, the Normal Value attribute has no meaning. |
| COVClass = COV | COVCounter > 0 | Number of state changes that occurred between acquisitions of a status point. Use of COV is optional. As an alternative, each state change can be sent to ERCOT without the COV attribute (COVClass = NOCOV) |

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# Data Exchange from Qualified Scheduling Entities (QSEs) to ERCOT

These data exchange tables identify data enumerated in the ERCOT Nodal Protocols that Market Participants and ERCOT must provide to each other as applicable. The naming convention tables provide a mechanism to identify and exchange the data specified in the data exchange tables using ICCP. In other words, the data exchange tables specify what data is be exchanged, while the naming convention tables describe how the data is exchanged. \*\*\*Per notes this info is outlined in Table(s) 20, and 26-32 for “From QSEs to ERCOT”.

Table 20 ICCP Object Names for Generation Control and Regulation Data Received from QSEs[[1]](#footnote-1)

| Resource or Equipment Type | Type Descriptor | Data | Data Descriptor | Unit of Measure | ICCP Data Type | ICCP Object Name Example  cccctttssssssssddddeeeeeeeeuuuu |
| --- | --- | --- | --- | --- | --- | --- |
| Generation Unit[[2]](#footnote-2) | UN | Net Power Flow | NPF | MW | RealQ | ACMQUN\_GENSUB\_NPF\_UNIT1\_MW |
| MV | RealQ | ACMQUN\_GENSUB\_NPF\_UNIT1\_MV |
| Gross Power Flow | GPF | MW | RealQ | ACMQUN\_GENSUB\_GPF\_UNIT1\_MW |
| MV | RealQ | ACMQUN\_GENSUB\_GPF\_UNIT1\_MV |
| Breaker Status | BRKR | ST | StateQ | ACMQUN\_GENSUB\_BRKRUNIT1\_ST |
| AVR Status | AVR | ST | StateQ | ACMQUN\_GENSUB\_AVR\_UNIT1\_ST |
| PSS Status | PSS | ST | StateQ | ACMQUN\_GENSUB\_PSS\_UNIT1\_ST |
| Combine-cycle Configuration Number[[3]](#footnote-3) | CCC | INDX | DiscreteQ | ACMQUN\_GENSUB\_CCC\_UNIT1\_INDX |
| Combine-cycle Non Frequency Responsive Capacity | NFRC | MW | RealQ | ACMQUN\_GENSUB\_NFRCUNIT1\_MW |
| Dynamically Scheduled Resource Schedule | DSRS | MW | RealQ | ACMQUN\_GENSUB\_DSRSUNIT1\_MW |
| Emergency Ramp Rate Up | EURR | MW | RealQ | ACMQUN\_GENSUB\_EURRUNIT1\_MW |
| Emergency Ramp Rate Down | EDRR | MW | RealQ | ACMQUN\_GENSUB\_EDRRUNIT1\_MW |
| FRRS Up Participation Factor | FUPF | None (0-1) | RealQ | ACMQUN\_GENSUB\_FUPFUNIT1\_MW |
| FRRS Up Responsibility | FURS | MW | RealQ | ACMQUN\_GENSUB\_FURSUNIT1\_MW |
| High Emergency Limit | HEL | MW | RealQ | ACMQUN\_GENSUB\_HEL\_UNIT1\_MW |
| High Sustained Limit | HSL | MW | RealQ | ACMQUN\_GENSUB\_HSL\_UNIT1\_MW |
| Lower Block Status | LBST | ST | StateQ | ACMQUN\_GENSUB\_LBSTUNIT1\_ST |
| Low Emergency Limit | LEL | MW | RealQ | ACMQUN\_GENSUB\_LEL\_UNIT1\_MW |
| Low Sustained Limit | LSL | MW | RealQ | ACMQUN\_GENSUB\_LSL\_UNIT1\_MW |
| Normal Ramp Rate Up | NURR | MW | RealQ | ACMQUN\_GENSUB\_NURRUNIT1\_MW |
| Normal Ramp Rate Down | NDRR | MW | RealQ | ACMQUN\_GENSUB\_NDRRUNIT1\_MW |
| Non-Spin Responsibility | NSRS | MW | RealQ | ACMQUN\_GENSUB\_NSRSUNIT1\_MW |
| Non-spin Schedule | NSSC | MW | RealQ | ACMQUN\_GENSUB\_NSSCUNIT1\_MW |
| Number of Turbines Online[[4]](#footnote-4) | NTON | INDX | DiscreteQ | ACMQUN\_GENSUB\_NTONUNIT1\_INDX |
| Number of Turbines Offline17 | NTOF | INDX | DiscreteQ | ACMQUN\_GENSUB\_NTOFUNIT1\_INDX |
| Number of Turbines Unknown Status17 | NTUN | INDX | DiscreteQ | ACMQUN\_GENSUB\_NTUNUNIT1\_INDX |
| Number of Inverters Online[[5]](#footnote-5) | NION | INDX | DiscreteQ | ACMQUN\_GENSUB\_NIONUNIT1\_INDX |
| Number of Inverters Offline | NIOF | INDX | DiscreteQ | ACMQUN\_GENSUB\_NIOFUNIT1\_INDX |
| Number of Inverters Unknown Status | NIUN | INDX | DiscreteQ | ACMQUN\_GENSUB\_NIUNUNIT1\_INDX |
| Raise Block Status | RBST | ST | StateQ | ACMQUN\_GENSUB\_RBSTUNIT1\_ST |
| Regulation Down Participation Factor | RDPF | None (0-1) | RealQ | ACMQUN\_GENSUB\_RDPFUNIT1\_MW |
| Regulation Down Responsibility | RDRS | MW | RealQ | ACMQUN\_GENSUB\_RDRSUNIT1\_MW |
| Responsive Reserve Responsibility | RRRS | MW | RealQ | ACMQUN\_GENSUB\_RRRSUNIT1\_MW |
| Responsive Reserve Ancillary Service Schedule | RRSC | MW | RealQ | ACMQUN\_GENSUB\_RRSCUNIT1\_MW |
| Resource Status | RST | INDX | DiscreteQ | ACMQUN\_GENSUB\_RST\_UNIT1\_INDX |
| Regulation Up Participation Factor | RUPF | None (0-1) | RealQ | ACMQUN\_GENSUB\_RUPFUNIT1\_MW |
| Regulation Up Responsibility | RURS | MW | RealQ | ACMQUN\_GENSUB\_RURSUNIT1\_MW |
| Maximum Operating State of Charge  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | MXOS | MWh | RealQ | ACMQUN\_GENSUB\_MXOSUNIT1\_MWH |
| Minimum Operating State of Charge  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | MNOS | MWh | RealQ | ACMQUN\_GENSUB\_MNOSUNIT1\_MWH |
| State of Charge  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | SOC | MWh | RealQ | ACMQUN\_GENSUB\_SOC\_UNIT1\_MWH |
| Maximum Operating Discharge Power Limit  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | MXDP | MW | RealQ | ACMQUN\_GENSUB\_MXDPUNIT1\_MW |
| Maximum Operating Charge Power Limit  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | MXCP | MW | RealQ | ACMQUN\_GENSUB\_MXCPUNIT1\_MW |
|  |  |  |  |  |
| Wind Resource Weather Station | WS | Barometric Pressure | BAROM | MILB | RealQ | ACMEWS\_WNDSUB\_0180BAROM1\_MILB |
| Wind Direction | ANAMOM | DEG | RealQ | ACMEWS\_WNDSUB\_0180ANAMOM1\_DEG |
| Wind Speed | ANAMOM | MPH | RealQ | ACMEWS\_WNDSUB\_0180ANAMOM1\_MPH |
| Temperature | THERMO | DEGC | RealQ | ACMEWS\_WNDSUB\_0180THERMO1\_DEGC |
| Controllable Load Resource | CLR | Net Load | NPF | MW | RealQ | ACLQCLRSUBONE\_NPF\_LOAD1\_MW |
| NPF | MV | RealQ | ACLQCLRSUBONE\_NPF\_LOAD1\_MV |
| Emergency Ramp Rate Up | EURR | MW | RealQ | ACLQCLRSUBONE\_EURRLOAD1\_MW |
| Emergency Ramp Rate Down | EDRR | MW | RealQ | ACLQCLRSUBONE\_EDRRLOAD1\_MW |
| Lower Block Status | LBST | ST | StateQ | ACLQCLRSUBONE\_LBSTLOAD1\_ST |
| Normal Ramp Rate Up | NURR | MW | RealQ | ACLQCLRSUBONE\_NURRLOAD1\_MW |
| Normal Ramp Rate Down | NDRR | MW | RealQ | ACLQCLRSUBONE\_NDRRLOAD1\_MW |
| Non-Spin Responsibility | NSRS | MW | RealQ | ACLQCLRSUBONE\_NSRSLOAD1\_MW |
| Non-Spin Schedule | NSSC | MW | RealQ | ACLQCLRSUBONE\_NSSCLOAD1\_MW |
| Raise Block Status | RBST | ST | StateQ | ACLQCLRSUBONE\_RBSTLOAD1\_ST |
| Regulation Down Participation Factor | RDPF | None (0-1) | RealQ | ACLQCLRSUBONE\_RDPFLOAD1\_MW |
| FRRS Down Participation Factor | FDPF | None (0-1) | RealQ | ACLQCLRSUBONE\_FDPFLOAD1\_MW |
| FRRS Up Participation Factor | FUPF | None (0-1) | RealQ | ACLQCLRSUBONE\_FUPFLOAD1\_MW |
| Regulation Down Responsibility | RDRS | MW | RealQ | ACLQCLRSUBONE\_RDRSLOAD1\_MW |
| Responsive Reserve Responsibility | RRRS | MW | RealQ | ACLQCLRSUBONE\_RRRSLOAD1\_MW |
| Responsive Reserve Schedule | RRSC | MW | RealQ | ACLQCLRSUBONE\_RRSCLOAD1\_MW |
| Resource Status | RST | ST | DiscreteQ | ACLQCLRSUBONE\_RST\_LOAD1\_INDX |
| Regulation Up Participation Factor | RUPF | MW | RealQ | ACLQCLRSUBONE\_RUPFLOAD1\_MW |
| Regulation Up Responsibility | RURS | MW | RealQ | ACLQCLRSUBONE\_RURSLOAD1\_MW |
| Load Resource Breaker Status | LRCB | ST | StateQ | ACLQCLRSUBONE\_LRCBLOAD1\_ST |
| Scheduled Power Consumption[[6]](#footnote-6) | SPC | MW | RealQ | ACLQCLRSUBONE\_SPC\_LOAD1\_MW |
| Scheduled Power Consumption + 2 Hours | SPC2 | MW | RealQ | ACLQCLRSUBONE\_SPC2LOAD1\_MW |
| Load Resource Low Power Consumption | LPC | MW | RealQ | ACLQCLRSUBONE\_LPC\_LOAD1\_MW |
| Load Resource Maximum Power Consumption | MPC | MW | RealQ | ACLQCLRSUBONE\_MPC\_LOAD1\_MW |
| FRRS Down Responsibility | FDRS | MW | RealQ | ACLQCLRSUBONE\_FDRSLOAD1\_MW |
|  | FRRS UP Responsibility | FURS | MW | RealQ | ACLQCLRSUBONE\_FURSLOAD1\_MW |
|  |  | Maximum Operating State of Charge  (Only for storage resource modeled as ONLY Controllable Load Resource) | MXOS | MWh | RealQ | ACLQCLRSUBONE\_MXOSLOAD1\_MWH |
|  |  | Minimum Operating State of Charge  (Only for storage resource modeled as ONLY Controllable Load Resource) | MNOS | MWh | RealQ | ACLQCLRSUBONE\_MNOSLOAD1\_MWH |
|  |  | State of Charge  (Only for storage resource modeled as ONLY Controllable Load Resource) | SOC | MWh | RealQ | ACLQCLRSUBONE\_SOC\_LOAD1\_MWH |
|  |  | Maximum Operating Discharge Power Limit  (Only for storage resource modeled as ONLY Controllable Load Resource) | MXDP | MW | RealQ | ACLQCLRSUBONE\_MXDPLOAD1\_MWH |
|  |  | Maximum Operating Charge Power Limit  (Only for storage resource modeled as ONLY Controllable Load Resource) | MXCP | MW | RealQ | ACLQCLRSUBONE\_MXCPLOAD1\_MWH |
| Non-Controllable Load Resource | LR | Net Load | NPF[[7]](#footnote-7) | MW | RealQ | ACLQLR\_SUBONE\_NPF\_LOAD2\_MW |
| High-set Under-frequency Relay Status | HSUF | ST | StateQ | ACLQLR\_SUBONE\_HSUFLOAD2\_ST |
| Load Resource Breaker Status | LRCB | ST | StateQ | ACLQLR\_SUBONE\_LRCBLOAD2\_ST |
| Resource Status | RST | ST | DiscreteQ | ACLQLR\_SUBONE\_RST\_LOAD2\_INDX |
| Responsive Reserve Responsibility | RRRS | MW | RealQ | ACLQLR\_SUBONE\_RRRSLOAD2\_MW |
| Responsive Reserve Schedule | RRSC | MW | RealQ | ACLQLR\_SUBONE\_RRSCLOAD2\_MW |
| Load Resource Low Power Consumption17 | LPC | MW | RealQ | ACLQLRSUBONE\_LPC\_LOAD2\_MW |
| Load Resource Maximum Power Consumption17 | MPC | MW | RealQ | ACLQLRSUBONE\_MPC\_LOAD2\_MW |
| Generation Plant | GP | Plant Auxiliary Load | LOAD | MW | RealQ | ACMQGP\_GENSUB\_LOADGENSUB\_MW |
| QSE | QSE | System Frequency | FREQ | HZ | RealQ | ACMQQSEQSE\_FREQQSE\_HZ |
| DSR Load | DSRL | MW | RealQ | ACMQQSEQSE\_DSRLQSE\_MW |

## Data Received from QSEs

Table 26 Per-QSE Data Received from QSE

| Per-QSE Data Received from QSE | Frequency (sec) | Nodal Protocol Reference |
| --- | --- | --- |
| Frequency (system) | 2 | 6.5.7.6.1 (3) |
| Any agreed-upon additional Resource data (multiple data items) | various | 6.5.5.2 (2) e 6.5.5.2 () (implied) |

Table 27 Per-Plant Data Received from QSE

| Per-Plant Data Received from QSE | Frequency (sec) | Nodal Protocol Reference |
| --- | --- | --- |
| Power to standby transformers serving Plant auxiliary Load (MW) | 10 | 6.5.5.2 (2) e |
| Switch status not monitored by TSP (possibly multiple switches) | 10 | 6.5.5.2 (2) f |
| Any agreed-upon additional Resource data (multiple data items) | various | 6.5.5.2 (implied) |

Table 28 Per-Generation Resource Data Received from QSE

| Per-Generation Resource Data Received from QSE | Frequency (sec) | Nodal Protocol Reference |
| --- | --- | --- |
| Combined Cycle configuration number | 2 | 6.5.5.2 (8) b |
| Resource Status | 2 | 6.4.5 (1) 6.5.5.1 (1) |
| Generation Resource Net MW (to be used in LFC and SCED) | 2 | 6.5.5.2 (2) a |
| Generation Resource Net MVAR | 2 | 6.5.5.2 (2)d |
| Generation Resource Gross MW | 2 | 6.5.5.2 (2) b |
| Generation Resource Gross MVAR | 2 | 6.5.5.2 (2) c |
| Generation Resource Breaker status | 2 | 6.5.5.2 (2) f |
| Generation Resource AVR Status | 2 | 6.5.5.2 (2) g |
| Generation Resource PSS Status | 2 | 6.5.5.2 (2) g |
| Generation Resource High Sustained Limit (HSL) | 2 | 6.4.5 (1) 6.5.5.2 (2) i 6.5.7.1.13 (1) (d) (ii) (B) |
| Generation Resource Low Sustained Limit (LSL) | 2 | 6.4.5 (1) 6.5.5.2 (2) l 6.5.7.1.13 (1) (d) (ii) (C) |
| Generation Resource High Emergency Limit (HEL) | 2 | 6.5.5.2 (2) j |
| Generation Resource Low Emergency Limit (LEL) | 2 | 6.5.5.2 (2) k |
| Generation Resource Responsive Reserve Ancillary Service Schedule | 2 | 6.5.5.2 (2) m |
| Generation Resource Non-Spin Ancillary Service Schedule | 2 | 6.5.5.2 (2) m |
| Generation Resource Reg-Up participation factor | 2 | 6.5.5.2 (2) o |
| Generation Resource Reg-Down participation factor | 2 | 6.5.5.2 (2) o |
| Generation Resource FRRS-Up participation factor | 2 | 6.5.5.2 (2) o |
| Generator Reg-Up Ancillary Service Resource Responsibility | 2 | 6.5.5.2 (2) n |
| Generator Reg-Down Ancillary Service Resource Responsibility | 2 | 6.5.5.2 (2) n |
| Generator FRRS-Up Ancillary Service Resource Responsibility | 2 | 6.5.5.2 (2) p |
| Generator Responsive Reserve Ancillary Service Resource Responsibility | 2 | 6.5.5.2 (2) n |
| Generator Non-Spin Ancillary Service Resource Responsibility | 2 | 6.5.5.2 (2) n |
| Generation Resource Raise block status | 2 | 6.5.5.2 (6) |
| Generation Resource Lower block status | 2 | 6.5.5.2 (6) |
| Generation Resource Normal Ramp Rate | 2 | 6.4.5 (1) |
| Generation Resource Emergency Ramp Rate | 2 | 6.4.5 (1) |
| Generation Resource DSR Schedule | 2 | 6.5.7.6.1 (8) i |
| DSR Load | 2 | 6.4.2.5 (3) a |
| Generator Step-up transformers tap position | 10 | 6.5.7.1.13 (1) (d) (ii) (A) |
| Number of Turbines/Generators Online | 10 | 3.15(12)  6.5.5.2(4) |
| Number of Turbines Offline | 10 | 3.15(12) |
| Number of Turbine Unknown | 10 | 3.15(12) |
| Number of Inverters Online | 10 | 3.15(13) |
| Number of Inverters Offline | 10 | 3.15(13) |
| Number of Inverters Unknown | 10 | 3.15(13) |
| Maximum Operating State of Charge  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |
| Minimum Operating State of Charge  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |
| State of Charge  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |
| Maximum Operating Discharge Power Limit  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |
| Maximum Operating Charge Power Limit  (Only for storage resource modeled as BOTH Generation Resource and Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |
| Any agreed-upon additional Resource data (multiple data items) | various | 6.5.5.2 (2) g |

Table 29 Per-Load Resource Data Received from QSE

| Per-Load Resource Data Received from QSE | Frequency (sec) | Nodal Protocol Reference |
| --- | --- | --- |
| Load Resource MW | 2 | 6.5.5.2 (5) a |
| Resource Status | 2 | 6.4.5 (1) 6.5.5.2 (5) k |
| Load Resource breaker status | 2 | 6.5.5.2 (5) c |
| High-set under-frequency relay status (if required for qualification) | 2 | 6.5.5.2 (5) h |
| Controllable Load Resource Scheduled Power Consumption | 2 | 6.5.5.2 (5) i |
| Controllable Load Resource Scheduled Power Consumption plus 2 hours | 2 | 6.5.5.2 (5) m |
| Controllable Load Resource Net Reactive Power | 2 | 6.5.5.2 (5) j |
| Controllable Load Resource Low Power Consumption (LPC) | 2 | 6.5.5.2 (5) d |
| Controllable Load Resource Maximum Power Consumption (MPC) | 2 | 6.5.5.2 (5) e |
| Controllable Load Resource Responsive Reserve Ancillary Service Schedule | 2 | 6.5.5.2 (5) f |
| Controllable Load Resource Non-Spin Ancillary Service Schedule | 2 | 6.5.5.2 (5) f |
| Controllable Load Resource Reg-Up participation factor | 2 | 6.5.5.2 (5) f |
| Controllable Load Resource Reg-Down participation factor | 2 | 6.5.5.2 (5) f |
| Controllable Load Resource FRRS-Down Responsibility | 2 | 6.5.5.2 (5) l |
| Controllable Load Resource FRRS-Up participation factor | 2 | 6.5.5.2 (5) f |
| Controllable Load Resource FRRS-Down participation factor | 2 | 6.5.5.2 (5) f |
| Controllable Load Resource FRRS-Up Responsibility | 2 | 6.5.5.2 (5) l |
| Load Resource Reg-Up Ancillary Service Resource Responsibility | 2 | 6.5.5.2 (5) g |
| Load Resource Reg-Down Ancillary Service Resource Responsibility | 2 | 6.5.5.2 (5) g |
| Load Resource Responsive Reserve Ancillary Service Resource Responsibility | 2 | 6.5.5.2 (5) g |
| Load Resource Non-Spin Ancillary Service Resource Responsibility | 2 | 6.5.5.2 (5) g |
| Controllable Load Resource Raise block status | 2 | 6.5.5.2 (7) |
| Controllable Load Resource Lower block status | 2 | 6.5.5.2 (7) |
| Controllable Load Resource Normal Ramp Rate | 2 | 6.5.5.2 (5) b |
| Controllable Load Resource Emergency Ramp Rate | 2 | 6.5.5.2 (5) b |
| Maximum Operating State of Charge  (Only for storage resource modeled as ONLY Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |
| Minimum Operating State of Charge  (Only for storage resource modeled as ONLY Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |
| State of Charge  (Only for storage resource modeled as ONLY Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |
| Maximum Operating Discharge Power Limit  (Only for storage resource modeled as ONLY Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |
| Maximum Operating Charge Power Limit  (Only for storage resource modeled as ONLY Controllable Load Resource) | 2 | 6.5.5.2 (2) (g) |

Table 30 Per-Wind Resource Data Received from QSE

| Per Wind Resource Data Received from QSE | Frequency (sec) | Nodal Protocol Reference |
| --- | --- | --- |
| Wind Speed | 10 | 6.5.7.1.13 (1) (e) 4.2.2 (1) (implied) |
| Wind Direction | 10 | 4.2.2 (1) (implied) |
| Temperature | 10 | 4.2.2 (1) (implied) |
| Barometric Pressure | 10 | 4.2.2 (1) (implied) |

Table 31 Per-PhotoVoltaic Resource Data Received from QSE

| Per Wind Resource Data Received from QSE | Frequency (sec) | Nodal Protocol Reference |
| --- | --- | --- |
| Wind Speed | 10 | 4.2.3(1) (implied) |
| Wind Direction | 10 | 4.2.3(1) (implied) |
| Temperature | 10 | 4.2.3(1) (implied) |
| Barometric Pressure | 10 | 4.2.3(1) (implied) |
| Back Panel Temperature | 10 | 4.2.3(1) (implied) |
| Plane of Array Irradiance | 10 | 4.2.3(1) (implied) |

Table 32 Per-Non-Controllable Load Resource Data Received from QSE

| Per-Non-Controllable Load Resource Data Received from QSE | Frequency (sec) | Nodal Protocol Reference |
| --- | --- | --- |
| Load Resource Net MW | 2 | 3.6 (implied) |
| Load Resource Net MVAR[[8]](#footnote-8) | 2 | 3.6 (implied) |
| High-set under-frequency relay status | 2 | 3.6 (implied) |
| Load Resource breaker status | 2 | 3.6 (implied) |
| Load Resource status | 2 | 3.6 (implied) |
| Responsive reserve responsibility | 2 | 3.6 (implied) |
| Responsive reserve schedule | 2 | 3.6 (implied) |

# 

# Data Exchange from ERCOT to QSEs

These data exchange tables identify data enumerated in the ERCOT Nodal Protocols that Market Participants and ERCOT must provide to each other as applicable. The naming convention tables provide a mechanism to identify and exchange the data specified in the data exchange tables using ICCP. In other words, the data exchange tables specify what data is be exchanged, while the naming convention tables describe how the data is exchanged. \*\*\*Per notes this info is outlined in Table(s) 19, and 21-25 for “From ERCOT to QSEs”.

Table 19 ICCP Object Names for Generation Control and Regulation Data Sent to QSEs

| Resource or Equipment Type | Type Descriptor | Data | Data Descriptor | Unit of Measure | ICCP Data Type | ICCP Object Name Example  Cccctttssssssssddddeeeeeeeeuuuu |
| --- | --- | --- | --- | --- | --- | --- |
| QSE | QSE | Regulation Down | REGD | MW | RealQ | ACMQQSEQSE\_REGDQSE\_MW |
| Regulation Up | REGU | MW | RealQ | ACMQQSEQSE\_REGUQSE\_MW |
| Responsive Reserve | RR | MW | RealQ | ACMQQSEQSE\_RR\_QSE\_MW |
| FRRS-UP Requirement | FURQ | MW | RealQ | ACMQQSEQSE\_FURQ\_QSE\_MW |
| FRRS-Down Requirement | FDRQ | MW | RealQ | ACMQQSEQSE\_FDRQ\_QSE\_MW |
| Generation Unit | UN | Locational Marginal Price | LMP | USD | RealQ | ACMQUN\_GENSUB\_LMP\_UNIT1\_USD |
| Base Point | BP | MW | RealQ | ACMQUN\_GENSUB\_BP\_UNIT1\_MW |
| Updated Desired Base Point | UDBP | MW | RealQ | ACMQUN\_GENSUB\_UDBP\_UNIT1\_MW |
| Non-Spin Deployed | NDPL | ST | StateQ | ACMQUN\_GENSUB\_NDPL\_UNIT1\_ST |
| Curtailment Flag | SBBH | ST | StateQ | ACMQUN\_GENSUB\_SBBH\_UNIT1\_ST |
| SCCT Mitigation Flag | SCCT | ST | StateQ | ACMQUN\_GENSUB\_SCCT\_UNIT1\_ST |

## Data Sent to QSEs

Table 21 Per-QSE Data Sent to QSE

| Per-QSE Data Sent to QSE | Frequency (sec) | Nodal Protocol Reference |
| --- | --- | --- |
| Regulation Up MW | 4 | 6.5.7.6.2.1 (8) |
| Regulation Down MW | 4 | 6.5.7.6.2.1 (8) |
| Responsive Reserve MW | 4 | 6.5.7.6.2.2 (12) |
| FRRS-Up Requirement | 4 | 6.5.7.6.2.1 (8) |
| FRRS-Down Requirement | 4 | 6.5.7.6.2.1 (8) |

Table 22 Per-Resource Data Sent to QSE

| Per-Generation Resource Data Sent to QSE | Frequency (sec) | Nodal Protocol Reference |
| --- | --- | --- |
| Updated Desired Generation | 4 | 6.5.7.6.1 (4) |
| Resource Base Point MW | 300 (or on demand) | 6.5.7.4 (b) |
| Other possible information (multiple values) for Base Point | 300 (or on demand) | 6.5.7.4 (d) |
| Flag indicating SCED dispatched Base Point below HDL (Curtailment Flag) | 300 (or on demand) | 6.5.7.0 |
| Flag indicating Non-Spin deployment | 300 (or on demand) | 6.5.7.6.2.3(11) |
| Flag indicating that the Resource is identified for mitigation | 300 (or on demand) | 6.5.7.4(f) |

Table 23 Per-Hub Data Sent to QSE

| Per-Hub Data Sent to QSE | Frequency (min) | Nodal Protocol Reference |
| --- | --- | --- |
| Hub LMP | 5 (or on demand) | 6.3.2 (2) table |

Table 24 Per-Load Zone Data Sent to QSE

| Per-Buss Data Sent to QSE | Frequency (min) | Nodal Protocol Reference |
| --- | --- | --- |
| Load Zone LMP | 5 (or on demand) | 6.3.2 (2) table |

Table 25 Real-Time Reserve Data Sent to QSE

| System Wide Reserve Data Sent to QSE | Frequency (min) | Nodal Protocol Reference |
| --- | --- | --- |
| Total Real-Time Online Reserve | 5 (or on demand) | 6.3.2 (2) table |
| Total Real-Time Offline Reserve | 5 (or on demand) | 6.3.2 (2) table |
| Real-Time On-line Reserve Price Adder | 5 (or on demand) | 6.3.2 (2) table |
| Real-Time Off-line Reserve Price Adder | 5 (or on demand) | 6.3.2 (2) table |
| Real-Time On-Line Reliability Deployment Price Adder | 5 (or on demand) | 6.3.2 (2) table |
| Total Online Resources’ HASL | 5 (or on demand) | 6.3.2 (2) table |
| Total Online Resources’ LASL | 5 (or on demand) | 6.3.2 (2) table |
| Total Deployed ERS MW | 5 (or on demand) | 6.3.2 (2) table |
| Total Deployed RRS MW from Load Resources | 5 (or on demand) | 6.3.2 (2) table |
| Total sum of RUC-committed and RMR Units’ LDL | 5 (or on demand) | 6.3.2 (2) table |

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# Data Exchange from Transmission Service Providers (TSPs) to ERCOT

\*\*\*Per notes this info is outlined in Table 33 of the handbook for “Data from TSP”

Table 33 ERCOT TSP ICCP Data Object Naming Conventions

| Device | Type Descriptor | Measurement | Unit | ICCP Data Type | ICCP Object Name Example  cccctttssssssssvvvveeeeeeeeuuuu |
| --- | --- | --- | --- | --- | --- |
| Buss | BS | Voltage | KV | RealQ | ACMEBS\_EXASUB\_3450BUS1A\_KV |
| Frequency | HZ | RealQ | ACMEBS\_EXASUB\_3450BUS1A\_HZ |
| Transformer | XF | Megawatts | MW | RealQ | ACMEXF\_EXASUB\_1380AUTO1\_MW |
| Megavars | MV | RealQ | ACMEXF\_EXASUB\_1380AUTO1\_MV |
| Tap Position | TAP | DiscreteQ | ACMEXF\_EXASUB\_1380AUTO1\_TAP |
| Status | ST | StateQ | ACMEXF\_EXASUB\_1380AUTO1\_ST |
| Line | LN | Megawatts | MW | RealQ | ACMELN\_EXASUB\_0690SBASBB1\_MW |
| Megavars | MV | RealQ | ACMELN\_EXASUB\_0690SBASBB1\_MV |
| Amperes | AMP | RealQ | ACMELN\_EXASUB\_0690SBASBB1\_AMP |
| Temperature | DEGC | RealQ | ACMELN\_EXASUB\_0690SBASBB1\_DEGC |
| Status | ST | StateQ | ACMELN\_EXASUB\_0690SBASBB1\_ST |
| Reactor | SH | Megavars | MV | RealQ | ACMESH\_EXASUB\_1380SHU1\_\_MV |
| Status | ST | StateQ | ACMESH\_EXASUB\_1380SHU1\_\_ST |
| Breaker | CB | Megawatts | MW | RealQ | ACMECB\_EXASUB2\_3450OCB3580\_MW |
| Megavars | MV | RealQ | ACMECB\_EXASUB2\_3450OCB3580\_MV |
| Status | ST | StateQ | ACMECB\_EXASUB2\_3450OCB3580\_ST |
| Voltage Regulator | VR | Voltage | KV | RealQ | ACMEVR\_EXASUB2\_3450VR5\_KV |
| Status | ST | StateQ | ACMEVR\_EXASUB2\_3450VR5\_ST |
| Switch (Telemetered) | SW | Status | ST | StateQ | ACMESW\_EXASUB2\_3450BS1BS2\_ST |
| Switch (Non-Telemetered) | SW | Status | ST | State | ACMESW\_EXASUB2\_3450BS1BS2\_ST |
| Load | LD | Megawatts | MW | RealQ | ACMELD\_EXASUB1\_0690XLD1\_\_MW |
| Megavars | MV | RealQ | ACMELD\_EXASUB1\_0690XLD1\_\_MV |
| DC Injection | DC | Megawatts | MW | RealQ | ACMEDC\_DCTME\_3450DC1\_\_MW |
| Megavars | MV | RealQ | ACMEDC\_DCTME\_3450DC1\_MV |
| Status | ST | StateQ | ACMEDC\_DCTME\_3450DC1\_\_ST |
| Block Load Transfer Point | BLT | Megawatts | MW | RealQ | ACMEBLTMEXTPA\_3450SWA\_\_MW |
| Megavars | MV | RealQ | ACMEBLTMEXTPA\_3450SWA\_\_MV |
| Status | ST | StateQ | ACMEBLTMEXTPA\_3450SWA\_\_ST |
| Capacitor | CP | Megavars | MV | RealQ | ACMECP\_EXASUB\_1380CP1\_\_MV |

# Data Exchange from WAN Participants to ERCOT

# Appendix (if deemed necessary)

1. The meteorological data specified in 0, *Per-Wind Resource Data Received from QSE*, uses the naming convention given in , *ERCOT TSP ICCP Data Object Naming Conventions*, for weather station equipment. [↑](#footnote-ref-1)
2. The Generator Step-up Transformer Tap Position identified in 8, *Per-Generation Resource Data Received from QSE*, uses the naming convention given in for transformer equipment. [↑](#footnote-ref-2)
3. Refer to Section Combined *Cycle Configuration Number*, for the definition of the Combined Cycle configurations. [↑](#footnote-ref-3)
4. Number of Turbines Online, Offline and Unknown are used for WGR and AGR resources. Please see Protocol references in table 28 for additional details. [↑](#footnote-ref-4)
5. Number of Inverters Online, Offline and Unknown are used for PVGR resources. Please see Protocol references in table 28 for additional details. [↑](#footnote-ref-5)
6. A Load Resource’s Scheduled Power Consumption, Scheduled Power Consumption +2hours, Low Power Consumption (LPC) and Maximum Power Consumption (MPC) shall be telemetered to ERCOT by its QSE using a positive sign convention. [↑](#footnote-ref-6)
7. NET MVAR is required from Controllable Loads. The Nodal Protocols are silent on this issue where it concerns Non-Controllable Loads. ERCOT is requesting that Net MVAR be provided from Non-Controllable Loads if the measurement is available. Net MVAR is particularly needed for Transmission Level Voltages (>69kV). If telemetry is being taken from CTs and PTs at these levels, more than likely the reactive power measurements should be available through the power measurement instrumentation. If the Net Mvar measurement requires the installation of additional instrumentation then the MP is not required to provide the data. If ERCOT must have access to the measurement, then ERCOT will work with the MP via the processes defined in the TAC-approved Nodal Telemetry Standards. [↑](#footnote-ref-7)
8. NET MVAR is required from Controllable Loads. The Nodal Protocols are silent on this issue where it concerns Non-Controllable Loads. ERCOT is requesting that Net MVAR be provided from Non-Controllable Loads if the measurement is available. Net MVAR is particularly needed for Transmission Level Voltages (>69kV). If telemetry is being taken from CTs and PTs at these levels, more than likely the reactive power measurements should be available through the power measurement instrumentation. If the Net Mvar measurement requires the installation of additional instrumentation then the MP is not required to provide the data. If ERCOT *must* have access to the measurement, then ERCOT will work with the MP via the processes defined in the Nodal TAC-approved Telemetry Standards. [↑](#footnote-ref-8)