# Checklist PART 1: Request for Energization of Resource Entity Equipment

**[RESOURCE ENTITY submits checklist to commission their non-generator equipment]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RE** Name: |  | | | |
| Agent (optional): |  | | | |
| Date form completed: |  | | | |
| **Proposed Station Energization Date\*:** | | |  | |
| **Generation Interconnection or Change Request number (GINR #):** | | Is this a Temporary POI GINR? Y/N: | | If Temporary POI, What is GINR# of Permanent POI GINR: |

\* Actual date contingent on completion of requirements and approval from ERCOT.

Primary contact for Station Commissioning (Contacts may be RE’s Agent):

|  |  |
| --- | --- |
| Primary Contact Name: |  |
| Primary Contact Telephone Number: |  |
| Primary Contact E-mail Address: |  |

|  |  |  |
| --- | --- | --- |
| **Gen Station Mnemonic:** | |  |
| Gen Site Name: | TDSP: | |
| Load Zone: | Transmission Voltage: | |

Remedial Action Scheme (RAS) Yes No

Can the Generation Resource synchronously connect to another grid? Yes  No

Identify the QSE/TDSP responsible for sending ERCOT station telemetry:

|  |  |
| --- | --- |
| QSE: | TDSP: |

QSE primary contact (may be QSE’s Agent): TDSP primary telemetry contact:

|  |  |  |  |
| --- | --- | --- | --- |
| Name: |  | Name: |  |
| Telephone Number: |  | Telephone Number: |  |
| E-mail Address: |  | E-mail Address: |  |

The QSE and Resource Entity (RE) are required to comply with the ERCOT Protocols and Operating Guides from the moment the interconnection becomes operational. The RE confirms that the following requirements have been met: [**Submit PART 1 with copy of current Commissioning Plan**]

The Generation Resource is in the ERCOT Control Area.

Station telemetry to QSE and TDSP from the facility’s Point of Interconnection is in place and operational as of       (date), as required under ERCOT Operating Guide Section. 7.3 Telemetry, the ERCOT Nodal ICCP Communication Handbook, and any other telemetry required by the ERCOT Protocols, Operating Guides, or other binding documents. Enter specific comments about status of station telemetry in comment box on telemetry checklist below.

Primary and backup communications paths for telemetry from the Resource station to the QSE are as stated below:

Describe the primary telemetry communications path (indicate fiber, T1, microwave or other):

Describe the backup telemetry communications path (indicate fiber, T1, microwave, wireless, satellite or other):

The RE is capable of communicating the Resource’s Point of Interconnection information to ERCOT in the manner specified in Operating Guides Section 7.3, Telemetry, and Protocols Section 6.5.5.2, Operational Data Requirements, and any other information required by Section 3.10.7.5, Telemetry Standards. Instructions for ERCOT to escalate telemetry quality issues with QSE/RE during commissioning shall be included in the following comment section. **Comments**:

The RE confirms that the station RTU has been verified as operational and is sending data from the field to ERCOT via the QSE. Furthermore, in accordance with Protocols Section 6.5.5.2, the RE confirms that any telemetered values sent to ERCOT originate from the station RTU and the quality codes are accurate and appropriate. Any exceptions shall be identified in the comments section below.

**Comments:**

If ERCOT has previously determined that the proposed Generation Resource may violate operational standards pursuant to Protocols Section 16.5(4), the Resource Entity has determined a plan of action to meet the operational standards that may be violated and received ERCOT approval prior to requesting Initial Synchronization.

**Comments:**

For Intermittent Renewable Resources, the Resource Entity confirms capability of Voltage Ride-Through in accordance with Operating Guides Section 2.9.1. **Comments**:

For inverter-based Resources, the Resource Entity confirms capability of Voltage Ride-Through in accordance with Operating Guides Section 2.9.1 and momentary cessation will not be used.  **Comments:**

The Generation Resource understands their responsibility to provide accurate and timely updates to the Outage Scheduler to reflect their expected future equipment unavailability if they are expecting not to be capable of generating at their modeled maximum output level due to equipment derates. Prior to approval of each stage of commissioning, the Outage Scheduler must be updated to accurately reflect the Generation Resource’s future derate amount, start time and end time. Outage submission requirements are outlined in ERCOT Nodal Protocols Section 3.1. **Comments:**

The QSE has reliable voice communications with the new Generating Facility, ERCOT, and TDSP as required by ERCOT Operating Guides Section 3.2, Qualified Scheduling Entities.

The RE has provided ERCOT the technical equipment data to be used in modeling studies per ERCOT Operating Guides Section 3.3, Resource Entities. **Comments:**

The Full Interconnection Study (FIS) stability assessment has been completed as required per Section 5 of the ERCOT Planning Guide, and reviewed by the RE. The RE is aware of, and has taken provisions to mitigate, all non-thermal issues associated with the interconnection of the Generation Resource to the ERCOT system. **Comments:**

The Generation Resource understands the obligations with respect to phasor measurement recording equipment as required per Section 6 of the ERCOT Nodal Operating Guides and has plans to install phasor measurement recording equipment as necessary prior to requesting Initial Synchronization. This requirement applies to new generating facilities over 20 MVA aggregated at a single site, seeking Initial Synchronization after January 1, 2017. Operating Guide Section 6.1.3.3(1)(b) requires voltage phasor measurements for at least one generator-interconnected bus, current phasor measurements for each interconnected generator over 20 MVA and frequency and df/dt for at least one generator-interconnected bus measurement. **Comments:**

| **Station Telemetry** | | | | |
| --- | --- | --- | --- | --- |
|  | **Data** | **Frequency** | **Mode** | **Reference/Comments** |
|  | Station Switching Device status | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. (High side Typical TSP telemetry point; Low side typical QSE telemetry point)  **RE Comment:** |
|  | Station Breaker status | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. (Typical QSE telemetry point)  **RE Comment:** |
|  | Generation Resource High Side bus voltage | 10 sec | ICCP | Protocol Section 3.15, Voltage Support. May be supplied by the TDSP (Typical TDSP telemetry point) or Low Side voltage with appropriate transformer model may be substituted (Typical QSE telemetry point).  **RE Comment:** |
|  | Station Static and/or Dynamic Reactive Device(s) status for each device | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Station Static and/or Dynamic Reactive Device(s) MVAR output for each device | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Generator Step-Up (GSU) Transformer High-Side MW and MVAR for each modeled GSU | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Generation Resource auxiliary load and/or station service MW and MVAR for each modeled load | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Transmission Line Flow | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. (RE has confirmed that TSP is providing required points; Transmission Line Flow has telemetry for both the sending and receiving end of the interconnecting line if the Generation Resource is registered at a different station in the Network Operations Model).  **RE Comment:** |

By signing below I attest that information provided on this form (**PART 1**) is true, correct and complete, and that any substantial changes in such information will promptly be provided to the Electric Reliability Council of Texas (ERCOT).

|  |  |
| --- | --- |
| Signature: |  |

(RE Authorized Representative)

|  |  |
| --- | --- |
| Printed Name: |  |

(RE Authorized Representative)

|  |  |
| --- | --- |
| Date Signed: |  |

# Checklist PART 2: Request for Initial Synchronization

**(For Wind Units meeting PG 5.2.1(1)(b)(ii) use Part 2a and 2b below)**

**[QSE submits checklist to request Initial Synchronization of generator equipment]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **QSE** Name: |  | | | |
| Agent (optional): |  | | | |
| Date form completed: |  | | | |
| Date of Notice: |  | | | |
| **Gen Station Mnemonic:** | | |  | |
| Gen Site Name: |  | | | |
| Gen Unit Code(s): |  | | | |
| **GINR Number:** | | Is this a Temporary POI GINR? Y/N: | | If Temporary POI, What is GINR# of Permanent POI GINR: |
| \* Proposed Initial Synchronization Date : |  | | | |

\* Actual date contingent on completion of requirements and approval from ERCOT.

Primary and back-up contact personnel for Initial Synchronization (may be QSE’s Agent):

|  |  |
| --- | --- |
| Primary for Initial Synchronization Contact Name: |  |
| Primary Contact Telephone Number: |  |
| Primary Contact E-mail Address: |  |
| Back-Up Contact Name: |  |
| Back-Up Contact Telephone Number: |  |
| Back-Up Contact E-mail Address: |  |

\*If the Generation Resource is Split Metered:

|  |  |  |  |
| --- | --- | --- | --- |
| Identify the QSE responsible for coordinating the start-up testing: | | |  |
| Identify all of the QSE’s that are sharing this Generation Resource: |  | | |
| Projected Resource Commissioning Date (Generation Resource approved for participation in ERCOT market operations): | |  | |

The QSE and Resource Entity are required to comply with the ERCOT Protocols and Operating Guides from the moment the interconnection becomes operational. The QSE will comply with procedures for new Generation Resource start-up testing and the Initial Synchronization schedule will be communicated to the ERCOT Shift Supervisor. The QSE confirms that the following requirements have been met:

The Generation Resource understands their responsibility to provide accurate and timely updates to the Outage Scheduler to reflect their expected future equipment unavailability if they are expecting not to be capable of generating at their modeled maximum output level due to equipment derates. Prior to approval of each stage of commissioning, the Outage Scheduler must be updated to accurately reflect the Generation Resource’s future derate amount, start time and end time. Outage submission requirements are outlined in ERCOT Nodal Protocols Section 3.1. **Comments:**

Telemetry from the facility (station and generation) is in place and operational as of       (date) to QSE and TDSP (Optional). Enter specific comments about status of telemetry in QSE comment box on telemetry checklist on next page.

The QSE is capable of communicating the Resource’s Point of Interconnection information to ERCOT in the manner specified in Operating Guides Section 7.3, Telemetry, and Protocols Section 6.5.5.2, Operational Data Requirements, and any other information required by Section 3.10.7.5, Telemetry Standards. Instructions for ERCOT to escalate telemetry quality issues with the QSE during commissioning shall be included in the following comment section. **Comments**:

The QSE confirms that the station RTU has been verified as operational and is sending data from the field to ERCOT. Furthermore, in accordance with Protocols Section 6.5.5.2, the QSE confirms that any telemetered values sent to ERCOT originate from the station RTU and the quality codes are accurate and appropriate. Any exceptions shall be identified in the comments section below.

**Comments:**

QSE confirms voice and data communications with the Generation Resource, ERCOT, and TDSP (Optional) ERCOT Operating Guide Sections 3.2 and 7.1.2. **Comments:**

Automatic Voltage Regulator (AVR) operating in Voltage Control Mode will be in service as of       (date). AVR performance tests described in ERCOT Operating Guide Sections 2.2.5 and Protocol Section 8.1.1.2.1.4 will be reported to ERCOT prior to the Resource Commissioning Date, unless it is documented to the satisfaction of ERCOT that the local topology and resources do not permit successful demonstration of full capability. **Comments:**

Synchronous Generation Resources will have Power System Stabilizers (PSS) in service as of       (date). Per ERCOT Operating Guide Section 2.2.6, Power System Stabilizers, PSS will be installed and in-service prior to the Resource Commissioning Date. PSS performance tests will be reported to ERCOT within 30-days after PSS in-service date. If circumstances beyond the control of the RE prevent this testing from taking place, the RE shall document the circumstances and request and obtain an extension from ERCOT. Inverter-based Generation Resources do not have to meet the PSS requirements. **Comments:**

The Generation Resource will have a Governor in service as of       (date). Turbine Speed Governors, or equivalent governor response and governor droop settings and dead-band are registered and comply with ERCOT Operating Guide Sections 2.2.7 and Protocol Section 8.5.1.2. Governor performance tests will be reported to ERCOT prior to the Resource Commissioning Date. If circumstances beyond the control of the RE prevent this testing from taking place, the RE shall document the circumstances and request and obtain an extension from ERCOT. **Comments:**

Prior to Initial Synchronization of an Intermittent Renewable Resource (e.g. wind, solar) the QSE confirms availability of required meteorological data per Protocol Section 3.13.

The reactive controls (VARs) of this Generation Resource will be in service and enabled as of       (date) to maintain transmission voltage at the Point of Interconnection, as described in Protocol Section 3.15, Voltage Support. Additionally, in Real-Time, Generation Resources shall follow Voltage Set Points that could be different than the Seasonal Voltage Profiles posted on MIS Secure by ERCOT as described in ERCOT Operating Guides Sections 2.7.3.5, Resource Entity Responsibilities and Generation Resource Requirements, and 3.3.2, Unit Reactive Capability Requirements. Prior to the Resource Commissioning Date, compliance with Reactive Power requirements will be demonstrated in accordance with Protocol Section 3.15, Voltage Support. **Describe plan for voltage control at POI during commissioning in the space below (may reference associated section or page(s) on commissioning plan)**:

Generation Resource Under Frequency Relays comply with trip settings specified in ERCOT Operating Guides Section 2.6.2, Generators. **Comments:**

Prior to Initial Synchronization the Generation Resource shall install, or coordinate with its interconnecting TSP who will be installing, phasor measurement recording equipment. This includes digital fault recorders, certain protective relays and/or meters with phasor measurement recording capability that meet the requirements described in Section 6 of the ERCOT Nodal Operating Guides, is installed and is capable of operating for its intended purpose. This requirement applies to new generating facilities over 20 MVA aggregated at a single site, seeking Initial Synchronization after January 1, 2017. Operating Guide Section 6.1.3.3(1)(b) requires voltage phasor measurements for at least one generator-interconnected bus, current phasor measurements for each interconnected generator over 20 MVA and frequency and df/dt for at least one generator-interconnected bus measurement. **Comments:**

Prior to Initial Synchronization the Generation Resource shall have implemented the Sub-synchronous study Mitigation Plan identified in the Sub-synchronous study completed by the interconnecting TSP. **Comments:**

The QSE has received confirmation from the Resource Entity that ERCOT has approved the Protocol Section 16.5(4) compliance check.

**Comments:**

| **New Generator Telemetry** | | | | |
| --- | --- | --- | --- | --- |
|  | **Data** | **Frequency** | **Mode** | **Reference/Comments** |
|  | Real Time data accuracy |  |  | Real Time data for reliability purposes must be accurate to within three percent (3%). This telemetry may be provided from relaying accuracy instrumentation transformers.  **QSE Comment:** |
|  | Generation Resource gross and net MW output | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. Net Generation is preferred. Otherwise, aux load should also be provided.  **QSE Comment:** |
|  | Generation Resource gross and net MVar output | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. Net Reactive Power is preferred. Otherwise, aux load should also be provided.  **QSE Comment:** |
|  | Switching Device | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.  **QSE Comment:** |
|  | Breaker status | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements  **QSE Comment:** |
|  | Generation Resource High Sustainable Limit | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.  **QSE Comment:** |
|  | Generation Resource Low Sustainable Limit | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.  **QSE Comment:** |
|  | Generation Resource Automatic Voltage Regulator status | 2 sec | ICCP | Protocol Section 3.15.3, Generation Resource Requirements Related to Voltage Support. Applies to Generation Resources required to provide VSS.  **QSE Comment:** |
|  | Generation Resource Power System Stabilizer status | 2 sec | ICCP | Protocol Section 3.15.3, Generation Resource Requirements Related to Voltage Support. Applies to Generation Resources required to provide VSS.  **QSE Comment:** |
|  | POI kV Bus Voltage from TSP | 2 sec | ICCP | Protocol 3.10.7.5.2 (8), Continuous Telemetry of the Real-Time Measurements of Bus Load, Voltages, Tap Position, and Flows |
|  | POI Real Time Voltage Set Point from TSP | 2 sec | ICCP | Protocol 6.5.7.7 (6), Voltage Support Service |

**Intermittent Renewable Resources Only**[[1]](#footnote-2)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Additional Resource Data Required** | **Frequency (sec)** | **Protocol Reference** |
|  | Wind Speed (Miles per Hour) | 10 | 6.5.7.1.13 (1) (d) 4.2.2 (1) (implied) |
|  | Wind Direction (Degrees) | 10 | 4.2.2 (1) (implied) |
|  | Temperature (Celsius) | 10 | 4.2.2 (1) (implied) |
|  | Barometric Pressure (Millibars) | 10 | 4.2.2 (1) (implied) |
|  | Irradiance (Plane of Array) (PVGR only) | 10 | 4.2.2 (1) (implied) |
|  | Number of Turbines/Inverters/Generators Online | 10 | 3.15(12) and (13)  6.5.5.2(4) |
|  | Number of Turbines/Inverters Offline | 10 | 3.15(12) and (13) |
|  | Number of Turbines/Inverters Unknown | 10 | 3.15(12) and (13) |
|  | Back Panel Temperature | 10 | 4.2.3(1)(implied) |
|  | Plane of Array Irradiance | 10 | 4.2.3(1)(implied) |
|  | Any agreed-upon additional Resource data (multiple data items) | various | 6.5.5.2 (2) g |

**MET Tower Location [as registered]:**

**Latitude:**       **Longitude:**

**QSE Comment:**

**Energy Storage Resources (ESR) Only**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Additional Resource Data Required** | **Frequency (sec)** | **Protocol Reference** |
|  | Maximum Operating State of Charge, in MWh | 10 | Protocol Section 6.5.5.2, Operational Data Requirements. |
|  | Minimum Operating State of Charge, in MWh | 10 | Protocol Section 6.5.5.2, Operational Data Requirements. |
|  | State of Charge, in MWh | 10 | Protocol Section 6.5.5.2, Operational Data Requirements. |
|  | Maximum Operating Discharge Power Limit, in MW | 10 | Protocol Section 6.5.5.2, Operational Data Requirements. |
|  | Maximum Operating Charge Power Limit, in MW | 10 | Protocol Section 6.5.5.2, Operational Data Requirements. |

By signing below I attest that information provided on this form (**PART 2**) is true, correct and complete, and that any substantial changes in such information will promptly be provided to the Electric Reliability Council of Texas (ERCOT).

|  |  |
| --- | --- |
| Signature: |  |

(QSE Authorized Representative)

|  |  |
| --- | --- |
| Printed Name: |  |

(QSE Authorized Representative)

|  |  |
| --- | --- |
| Date Signed: |  |

# Checklist PART 2a: Request for Wind Units meeting PG 5.2.1(1)(b)(ii) Pre-Synchronization

**[QSE submits checklist to request approval to begin re-power work at the site]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **QSE** Name: |  | | |  |
| Agent (optional): |  | | |  |
| Date form completed: |  | | |  |
| Date of Notice: |  | | |  |
| **Gen Station Mnemonic:** |  | | |  |
| Gen Site Name: |  | | |  |
| Gen Unit Code(s): |  | | |  |
| **GINR Number:** | | Is this a Temporary POI GINR? Y/N: | If Temporary POI, What is GINR# of Permanent POI GINR: |  |
| \* Current Planned Initial Synchronization Date : |  | | |  |

\* Actual date contingent on completion of requirements and approval from ERCOT.

Primary and back-up contact personnel for Initial Synchronization (may be QSE’s Agent):

|  |  |
| --- | --- |
| Primary for Initial Synchronization Contact Name: |  |
| Primary Contact Telephone Number: |  |
| Primary Contact E-mail Address: |  |
| Back-Up Contact Name: |  |
| Back-Up Contact Telephone Number: |  |
| Back-Up Contact E-mail Address: |  |

\*If the Generation Resource is Split Metered:

|  |  |  |  |
| --- | --- | --- | --- |
| Identify the QSE responsible for coordinating the start-up testing: | | |  |
| Identify all of the QSE’s that are sharing this Generation Resource: |  | | |
| Projected Resource Commissioning Date (Generation Resource approved for participation in ERCOT market operations): | |  | |

**Checklist Part 2a will be submitted by the QSE prior to any re-powering activity commencing at the site. The model and telemetry used for this checklist will be the model used in ERCOT Operations prior to re-powering.**

Since the Part 1 checklist is typically not required for re-powering projects, the entire list of Part 1 and Part 2 telemetry requirements are shown in this checklist.

[**Submit PART 2a with copy of current Commissioning Plan showing the decommissioning of old turbines and commissioning of new or re-powered turbines**]

The QSE is responsible for all telemetry listed prior to submission of checklist Part 2b for Initial Synchronization of the first re-powered turbine, submitted after any model and telemetry changes have been loaded into the Network Operations Model.

The QSE and Resource Entity are required to comply with the ERCOT Protocols and Operating Guides from the moment the interconnection becomes operational. Following approval of the Part 2b checklist, the QSE will comply with procedures for new Generation Resource start-up testing and the Initial Synchronization schedule will be communicated to the ERCOT Shift Supervisor.

The QSE confirms that the following requirements have been met:

The QSE has received confirmation from the Resource Entity that ERCOT has approved the Protocol Section 16.5(4) compliance check for the re-powered Generation Resource required for part 2A.

**Comments:**

The QSE has received confirmation from the Resource Entity that no re-power work has commenced at the site of the re-powered Generation Resource. **Comments:**

The Generation Resource understands their responsibility to provide accurate and timely updates to the Outage Scheduler to reflect their expected future equipment unavailability if they are expecting not to be capable of generating at their modeled maximum output level due to equipment derates. Prior to approval of each stage of commissioning, the Outage Scheduler must be updated to accurately reflect the Generation Resource’s future derate amount, start time and end time. Outage submission requirements are outlined in ERCOT Nodal Protocols Section 3.1. **Comments:**

The QSE is capable of communicating the Resource’s Point of Interconnection information to ERCOT in the manner specified in Operating Guides Section 7.3, Telemetry, and Protocols Section 6.5.5.2, Operational Data Requirements, and any other information required by Section 3.10.7.5, Telemetry Standards. Instructions for ERCOT to escalate telemetry quality issues with the QSE during commissioning shall be included in the following comment section. **Comments**:

| **Station Telemetry** | | | | |
| --- | --- | --- | --- | --- |
|  | **Data** | **Frequency** | **Mode** | **Reference/Comments** |
|  | Station Switching Device status | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. (High side Typical TSP telemetry point; Low side typical QSE telemetry point)  **RE Comment:** |
|  | Station Breaker status | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. (Typical QSE telemetry point)  **RE Comment:** |
|  | Generation Resource High Side bus voltage | 10 sec | ICCP | Protocol Section 3.15, Voltage Support. May be supplied by the TDSP (Typical TDSP telemetry point) or Low Side voltage with appropriate transformer model may be substituted (Typical QSE telemetry point).  **RE Comment:** |
|  | Station Static and/or Dynamic Reactive Device(s) status for each device | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Station Static and/or Dynamic Reactive Device(s) MVAR output for each device | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Generator Step-Up (GSU) Transformer High-Side MW and MVAR for each modeled GSU | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Generation Resource auxiliary load and/or station service MW and MVAR for each modeled load | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Transmission Line Flow | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. (RE has confirmed that TSP is providing required points; Transmission Line Flow has telemetry for both the sending and receiving end of the interconnecting line if the Generation Resource is registered at a different station in the Network Operations Model).  **RE Comment:** |

| **New Generator Telemetry** | | | | |
| --- | --- | --- | --- | --- |
|  | **Data** | **Frequency** | **Mode** | **Reference/Comments** |
|  | Real Time data accuracy |  |  | Real Time data for reliability purposes must be accurate to within three percent (3%). This telemetry may be provided from relaying accuracy instrumentation transformers.  **QSE Comment:** |
|  | Generation Resource gross and net MW output | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. Net Generation is preferred. Otherwise, aux load should also be provided.  **QSE Comment:** |
|  | Generation Resource gross and net MVar output | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. Net Generation is preferred. Otherwise, aux load should also be provided.  **QSE Comment:** |
|  | Switching Device status | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.  **QSE Comment:** |
|  | Breaker status | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements  **QSE Comment:** |
|  | Generation Resource High Sustainable Limit | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.  **QSE Comment:** |
|  | Generation Resource Low Sustainable Limit | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.  **QSE Comment:** |
|  | Generation Resource Automatic Voltage Regulator status | 2 sec | ICCP | Protocol Section 3.15.3, Generation Resource Requirements Related to Voltage Support. Applies to Generation Resources required to provide VSS.  **QSE Comment:** |
|  | Generation Resource Power System Stabilizer status | 2 sec | ICCP | Protocol Section 3.15.3, Generation Resource Requirements Related to Voltage Support. Applies to Generation Resources required to provide VSS.  **QSE Comment:** |
|  | POI kV Bus Voltage from TSP | 2 sec | ICCP | Protocol 3.10.7.5.2 (8), Continuous Telemetry of the Real-Time Measurements of Bus Load, Voltages, Tap Position, and Flows |
|  | POI Real Time Voltage Set Point from TSP | 2 sec | ICCP | Protocol 6.5.7.7 (6), Voltage Support Service |

**Intermittent Renewable Resources Only**[[2]](#footnote-3)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Additional Wind Resource Data** | | **Frequency (sec)** | | **Protocol Reference** |
|  | Wind Speed (Miles per Hour) | | 10 | | 6.5.7.1.13 (1) (d) 4.2.2 (1) (implied) |
|  | Wind Direction (Degrees) | | 10 | | 4.2.2 (1) (implied) |
|  | Temperature (Celsius) | | 10 | | 4.2.2 (1) (implied) |
|  | Barometric Pressure (Millibars) | | 10 | | 4.2.2 (1) (implied) |
|  | Irradiance (Plane of Array) (PVGR only) | | 10 | | 4.2.2 (1) (implied) |
|  | Number of Turbines/Inverters Online | | 10 | | 3.15(12) and (13) |
|  | Number of Turbines/Inverters Offline | | 10 | | 3.15(12) and (13) |
|  | Number of Turbines/Inverters Unknown | | 10 | | 3.15(12) and (13) |
|  | Any agreed-upon additional Resource data (multiple data items) | various | | 6.5.5.2 (2) g | |

**MET Tower Location [as registered]:**

**Latitude:**       **Longitude:**

**QSE Comment:**

By signing below I attest that information provided on this form (**PART 2a**) is true, correct and complete, and that any substantial changes in such information will promptly be provided to the Electric Reliability Council of Texas (ERCOT).

|  |  |
| --- | --- |
| Signature: |  |

(QSE Authorized Representative)

|  |  |
| --- | --- |
| Printed Name: |  |

(QSE Authorized Representative)

|  |  |
| --- | --- |
| Date Signed: |  |

# Checklist PART 2b: Request for Wind Units meeting PG 5.2.1(1)(b)(ii) Initial Synchronization

**[QSE submits checklist prior to desired Initial Synchronization of first re-powered turbine]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **QSE** Name: |  | | | |
| Agent (optional): |  | | | |
| Date form completed: |  | | | |
| Date of Notice: |  | | | |
| **Gen Station Mnemonic:** | | |  | |
| Gen Site Name: |  | | | |
| Gen Unit Code(s): |  | | | |
| **GINR Number:** | | Is this a Temporary POI GINR? Y/N: | | If Temporary POI, What is GINR# of Permanent POI GINR: |
| \* Proposed Initial Synchronization Date : |  | | | |

\* Actual date contingent on completion of requirements and approval from ERCOT.

Primary and back-up contact personnel for Initial Synchronization (may be QSE’s Agent):

|  |  |
| --- | --- |
| Primary for Initial Synchronization Contact Name: |  |
| Primary Contact Telephone Number: |  |
| Primary Contact E-mail Address: |  |
| Back-Up Contact Name: |  |
| Back-Up Contact Telephone Number: |  |
| Back-Up Contact E-mail Address: |  |

\*If the Generation Resource is Split Metered:

|  |  |  |  |
| --- | --- | --- | --- |
| Identify the QSE responsible for coordinating the start-up testing: | | |  |
| Identify all of the QSE’s that are sharing this Generation Resource: |  | | |
| Projected Resource Commissioning Date (Generation Resource approved for participation in ERCOT market operations): | |  | |

This Part 2b checklist will be submitted by the QSE prior to Initial Synchronization of the first re-powered turbine. In some cases, the re-powering will result in different WGR aggregations modeled in the RARF in accordance with Protocol 3.10.7.2(11). The new model reflecting the WGR aggregations and the telemetry required for each WGR will be required to be completed and be loaded into the ERCOT Network Operations Model prior to submitting this checklist.

The QSE and Resource Entity are required to comply with the ERCOT Protocols and Operating Guides from the moment the interconnection becomes operational. The QSE will comply with procedures for new Generation Resource start-up testing and the initial synchronization schedule will be communicated to the ERCOT Shift Supervisor. The QSE confirms that the following requirements have been met:

The Generation Resource understands their responsibility to provide accurate and timely updates to the Outage Scheduler to reflect their expected future equipment unavailability if they are expecting not to be capable of generating at their modeled maximum output level due to equipment derates. Prior to approval of each stage of commissioning, the Outage Scheduler must be updated to accurately reflect the Generation Resource’s future derate amount, start time and end time. Outage submission requirements are outlined in ERCOT Nodal Protocols Section 3.1. **Comments:**

Telemetry from the facility (station and generation) is in place and operational as of       (date) to QSE and TDSP (Optional). Enter specific comments about status of telemetry in QSE comment box on telemetry checklist on next page.

The QSE is capable of communicating the Resource’s Point of Interconnection information to ERCOT in the manner specified in Operating Guides Section 7.3, Telemetry, and Protocols Section 6.5.5.2, Operational Data Requirements, and any other information required by Section 3.10.7.5, Telemetry Standards. Instructions for ERCOT to escalate telemetry quality issues with the QSE during commissioning shall be included in the following comment section. **Comments**:

Automatic Voltage Regulator (AVR) operating in Voltage Control Mode will be in service as of       (date). AVR performance tests described in ERCOT Operating Guide Sections 2.2.5 and Protocol Section 8.1.1.2.1.4 will be reported to ERCOT prior to the Resource Commissioning Date, unless it is documented to the satisfaction of ERCOT that the local topology and resources do not permit successful demonstration of full capability. **Comments:**

The reactive controls (VARs) of this Generation Resource will be in service and enabled as of       (date) to maintain transmission voltage at the Point of Interconnection, as described in Protocol Section 3.15, Voltage Support. Additionally, in real-time, Generation Resources shall follow Voltage Set Points that could be different than the Seasonal Voltage Profiles posted on MIS Secure by ERCOT as described in ERCOT Operating Guides Sections 2.7.3.5, Resource Entity Responsibilities and Generation Resource Requirements, and 3.3.2, Unit Reactive Capability Requirements. Prior to the Resource Commissioning Date, compliance with Reactive Power requirements will be demonstrated in accordance with Protocol Section 3.15, Voltage Support. **Describe plan for voltage control at POI during commissioning in the space below (may reference associated section or page(s) on commissioning plan)**:

Generation Resource Under Frequency Relays comply with trip settings specified in ERCOT Operating Guides Section 2.6.2, Generators. **Comments:**

Prior to Initial Synchronization the Generation Resource shall install, or coordinate with its interconnecting TSP who will be installing, phasor measurement recording equipment. This includes digital fault recorders, certain protective relays and/or meters with phasor measurement recording capability that meet the requirements described in Section 6 of the ERCOT Nodal Operating Guides, is installed and is capable of operating for its intended purpose. This requirement applies to new generating facilities over 20 MVA aggregated at a single site, seeking initial synchronization after January 1, 2017. Operating Guide Section 6.1.3.3(1)(b) requires voltage phasor measurements for at least one generator-interconnected bus, current phasor measurements for each interconnected generator over 20 MVA and frequency and df/dt for at least one generator-interconnected bus measurement. **Comments:**

Prior to Initial Synchronization the Generation Resource shall have implemented the Sub-synchronous study Mitigation Plan identified in the sub-synchronous Study completed by the interconnecting TSP. **Comments:**

The QSE has received confirmation from the Resource Entity that ERCOT has approved the Protocol Section 16.5(4) compliance check required for parts 2A and 2B.

**Comments:**

| **Station Telemetry** | | | | |
| --- | --- | --- | --- | --- |
|  | **Data** | **Frequency** | **Mode** | **Reference/Comments** |
|  | Station Switching Device status | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. (High side Typical TSP telemetry point; Low side typical QSE telemetry point)  **RE Comment:** |
|  | Station Breaker status | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. (Typical QSE telemetry point)  **RE Comment:** |
|  | Generation Resource High Side bus voltage | 10 sec | ICCP | Protocol Section 3.15, Voltage Support. May be supplied by the TDSP (Typical TDSP telemetry point) or Low Side voltage with appropriate transformer model may be substituted (Typical QSE telemetry point).  **RE Comment:** |
|  | Station Static and/or Dynamic Reactive Device(s) status for each device | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Station Static and/or Dynamic Reactive Device(s) MVAR output for each device | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Generator Step-Up (GSU) Transformer High-Side MW and MVAR for each modeled GSU | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Generation Resource auxiliary load and/or station service MW and MVAR for each modeled load | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.(Typical QSE telemetry point)  **RE Comment:** |
|  | Transmission Line Flow | 10 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. (RE has confirmed that TSP is providing required points; Transmission Line Flow has telemetry for both the sending and receiving end of the interconnecting line if the Generation Resource is registered at a different station in the Network Operations Model).  **RE Comment:** |

| **New Generator Telemetry** | | | | |
| --- | --- | --- | --- | --- |
|  | **Data** | **Frequency** | **Mode** | **Reference/Comments** |
|  | Real Time data accuracy |  |  | Real Time data for reliability purposes must be accurate to within three percent (3%). This telemetry may be provided from relaying accuracy instrumentation transformers.  **QSE Comment:** |
|  | Generation Resource gross and net MW output | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. Net Generation is preferred. Otherwise, aux load should also be provided.  **QSE Comment:** |
|  | Generation Resource gross and net MVar output | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements. Net Generation is preferred. Otherwise, aux load should also be provided.  **QSE Comment:** |
|  | Switching Device status other than reported in PART 1 | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.  **QSE Comment:** |
|  | Breaker status other than reported in PART 1 | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements  **QSE Comment:** |
|  | Generation Resource High Sustainable Limit | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.  **QSE Comment:** |
|  | Generation Resource Low Sustainable Limit | 2 sec | ICCP | Protocol Section 6.5.5.2, Operational Data Requirements.  **QSE Comment:** |
|  | Generation Resource Automatic Voltage Regulator status | 2 sec | ICCP | Protocol Section 3.15.3, Generation Resource Requirements Related to Voltage Support. Applies to Generation Resources required to provide VSS.  **QSE Comment:** |
|  | Generation Resource Power System Stabilizer status | 2 sec | ICCP | Protocol Section 3.15.3, Generation Resource Requirements Related to Voltage Support. Applies to Generation Resources required to provide VSS.  **QSE Comment:** |
|  | POI kV Bus Voltage from TSP | 2 sec | ICCP | Protocol 3.10.7.5.2 (8), Continuous Telemetry of the Real-Time Measurements of Bus Load, Voltages, Tap Position, and Flows |
|  | POI Real Time Voltage Set Point from TSP | 2 sec | ICCP | Protocol 6.5.7.7 (6), Voltage Support Service |

**Intermittent Renewable Resources Only**[[3]](#footnote-4)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Additional Wind Resource Data** | | **Frequency (sec)** | | **Protocol Reference** |
|  | Wind Speed (Miles per Hour) | | 10 | | 6.5.7.1.13 (1) (d) 4.2.2 (1) (implied) |
|  | Wind Direction (Degrees) | | 10 | | 4.2.2 (1) (implied) |
|  | Temperature (Celsius) | | 10 | | 4.2.2 (1) (implied) |
|  | Barometric Pressure (Millibars) | | 10 | | 4.2.2 (1) (implied) |
|  | Irradiance (Plane of Array) (PVGR only) | | 10 | | 4.2.2 (1) (implied) |
|  | Number of Turbines/Inverters Online | | 10 | | 3.15(12) and (13) |
|  | Number of Turbines/Inverters Offline | | 10 | | 3.15(12) and (13) |
|  | Number of Turbines/Inverters Unknown | | 10 | | 3.15(12) and (13) |
|  | Any agreed-upon additional Resource data (multiple data items) | various | | 6.5.5.2 (2) g | |

**MET Tower Location [as registered]:**

**Latitude:**       **Longitude:**

**QSE Comment:**

By signing below, I attest that information provided on this form (**PART 2b**) is true, correct and complete, and that any substantial changes in such information will promptly be provided to the Electric Reliability Council of Texas (ERCOT).

|  |  |
| --- | --- |
| Signature: |  |

(QSE Authorized Representative)

|  |  |
| --- | --- |
| Printed Name: |  |

(QSE Authorized Representative)

|  |  |
| --- | --- |
| Date Signed: |  |

# Checklist PART 3: Request to Commission a Resource

**[RESOURCE ENTITY submits checklist after approval of all commissioning tests]**

QSE and Resource Entity provide notice to ERCOT that the Generation Resource named below is ready to be commissioned on the date specified below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **RE** Name: |  | | | | |
| **QSE** Name: |  | | | | |
| Date of Notice: |  | | | | |
| **Gen Station Mnemonic:** | | |  | | |
| Gen Site Name: | | | | |
| Gen Unit Code(s): | | | | |
| **GINR Number:** | | Is this a Temporary POI GINR? Y/N: | | If Temporary POI, What is GINR# of Permanent POI GINR: | |
| Proposed Resource Commissioning Date\*: | | | | |
| \* Actual date contingent on completion of requirements and approval from ERCOT. | | | | |

**In accordance with Protocols Section 3.15(4) and (5), Voltage Support, and Protocol Section 8.1.1.2.1.4, Voltage Support Service Qualification, adequate reactive capability has been demonstrated by a performance test and engineering study, as checked below.**

Attachment O: Declaration of Completion of Generation Resource Winter Weatherization Preparations, was submitted to ERCOT on  (date) for Generation Resources and Energy Storage Resources requesting to commission a Resource during the winter months (December through February). For Generation Resources and Energy Storage Resources requesting to commission a Resource during the summer months (June through September), Attachment K: Declaration of Completion of Generation Resource Summer Weatherization Preparations and Natural Gas Pipeline Coordination for Resource Entities with Natural Gas Generation Resources, was submitted to ERCOT on  (date). **Comment:**

If the unit requesting commissioning entered the Generation Resource Interconnection and Change Request process due to meeting PG 5.2.1(1)(b)(ii), the IE must confirm all modification activities have been completed. Else put N/A. **Comment:**

Reactive performance test submitted and approved by ERCOT. **Comment:**

AVR, PSS (If required), and PFR testing has been completed and approved by ERCOT. **Comment:**

If the Dynamic Model has changed, or if the reactive capability submitted and approved in the reactive tests is different than what is in the RARF / RIOO-RS, then a RARF / RIOO-RS update has been submitted and approved by ERCOT. **Comment:**

Five minutes of PMU data has been submitted to and approved by ERCOT. **Comment:**

I understand that ERCOT must provide confirmation that this Resource has demonstrated adequate reactive capability before the Resource Commissioning Date.

I acknowledge that a Plant Verification Report is required to be submitted to ERCOT within 30 days following Part 3 approval per Paragraph (2) of Planning Guide 5.5, and a second report is required within 12 to 24 months following Part 3 approval. Details can be found in Paragraph (5)(b) of Planning Guide 6.2 and in Paragraph 3.1.8 of the [DWG Procedure Manual](http://www.ercot.com/committee/dwg).

By signing below I attest that information provided on this form (**PART 3**) is true, correct and complete, and that any substantial changes in such information will be provided to the Electric Reliability Council of Texas (ERCOT) in a timely manner.

|  |  |
| --- | --- |
| RE Signature: |  |

(RE Authorized Representative)

|  |  |
| --- | --- |
| Printed Name: |  |

(RE Authorized Representative)

|  |  |
| --- | --- |
| Date Signed: |  |

1. E.g. wind, solar, etc. [↑](#footnote-ref-2)
2. E.g. wind, solar, etc. [↑](#footnote-ref-3)
3. E.g., wind, solar, etc. [↑](#footnote-ref-4)