FAQs

NPRR 776
Voltage Set Point Communications

NDSWG & VPWG
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NPRR776 - Frequently Asked Questions

- Q1: Are the SCADA-Only-Substation kV values in addition to the existing kV measurements?
  - A1: Yes, these are in addition to what are measured at the bus.
    ERCOTS EMS will keep using the current bus kV measurements for State Estimation, (ignoring the new measurements). These new ICCP points may be from the same field SCADA measurement or an alternative SCADA measurement but should be the kV measurement used by the operator for setting the POI Voltage Set Point.
- Q2: Who will enter the Station and Units?
  - A2: ERCOT will provide a template in the IMM of our NMMS network modeling system. TDSPs will enter their own station and units, under the path Network/ERCOT_Texas_Network/ERCOT Substations/WZ_SCADA_ONLY/VOLTSETP
  - Use the existing naming pattern: <sub-station>_<unit code>_<unit#>
    example: CBY_CBY_G1
  - ERCOT will try to have the concatenation done for you as you enter the station name.
- Q3: Will ERCOT provide TDSPs a list of candidate stations & units to be modeled?
  - A3: Yes. We will provide a list of those we are aware of.
- Q4: Do TDSPs have to enter anything in the other folders below WZ_SCADA_ONLY
  - A4: No

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- Q5: How will TDSPs get notified of unit changes, such as when they are sold?
  - A5: This is not a frequent event. ERCOT will update the IMM/NMMS model if units are sold or re-named. Announcements will be made to the TDSPs and QSEs via the working groups and ERCOT Market Information System (MIS).
    ERCOT will publish the process for notifications of new, sold, retired, rename units.
- Q6: Will ERCOT share the survey performed earlier in the year regarding potential entities without telemetry?
  - A6: Yes. Any POIs that do not have telemetry equipment as the "go-live" of April 6 will have to submit a corrective action plan to Stephen Solis identifying when the telemetry will be added and what will be done in the interim.
- Q7: What are the expectations for Split-Bus topologies?
  - A7: During a split bus, the TDSP will have to ensure that the _KVM measurement in the SCADA_Only_Station is sending the measurement being utilized by the TDSP to assign the Voltage Set Point to. Example, if the normal measurement goes to Zero due to a bus outage, then an alternate measurement that is utilized by the TDSP should be sent to the ICCP point that is modeled in the SCADA_Only_Station. If the split bus results in an alternate bus having the measurement that is utilized by the TDSP, the alternate measurement should be sent to the ICCP point that is modeled in the SCADA_Only_Station.

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- Q8: Will changes be made in the ICCP?
  - A8: The SCADA_Only_Station allows the TDSP to manage writing the correct measurement and target for any abnormal scenarios such as split bus, outage, etc. without having to make ICCP changes. The TDSP may have to make changes on its SCADA systems to facilitate the switching of SCADA measurement for sending to ERCOT via ICCP depending on the abnormal scenario.
- Q9: What does a TDSP do when providing models and values for another (non-registered) entity (e.g. Private Use Networks, PUN), where no measuring equipment is on the Unit and they don't have a QSE?
  - A9: This will need additional discussion as ERCOT needs to understand how Voltage Set Point coordination between the non-registered entity required to provide VSS so that the process can be replicated. Specific PUNs can be discussed with the Voltage Profile Working Group (VPWG) regarding the associated VSS Services.
  - PUNs without a QSE and/or without telemetry equipment on the Units will require an alternative solution to the SCADA_Only_Substation
  - To determine how significant this issue is, ERCOT will research how many PUNs exist without a QSE or are otherwise not able to send or receive telemetry.
- Q10: Will ERCOT pass the _KVM and _KVT values directly to the Generation Entity instead of the QSE?
  - A10: No; ERCOT will pass the values to the QSEs, who have the responsibility of passing them on to the Generation Entity (GE).

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- Q11: Will ERCOT provide the template and guidance before the go-live?
  - A11: Yes. Guidance on the template will be delivered at the Jan 23 NDSWG meeting. The template will be loaded on Jan 24
- Q12: When are TDSPs expected to load the model?
  - A12: Between Jan 24 and March 14, TDSPs update the model. **Please update your models ASAP** and submit NOMCRs by March 15
- Q13: When are TDSPs expected to begin transmitting the analog values, and QSEs receiving them?
  - ***A13: By March 15 ERCOT may be able to share with the QSEs anticipated ICCP names (in advance of the April 6 availability.)***
  - ***As of April 6, ERCOT's systems will receive analog values from TDSPs, and transmit to QSEs (pending availability from TDSPs).***
  - ***QSEs will have until May 31 to provide the ICCP analog values to their associated GEs and confirm completion to ERCOT.***

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- Q14: Will defining the SCADA_Only_Substation affect how POIs are represented in the RARF?
  - A14: No
- Q15: If the POI voltage is outside the parameters of Set Point (voltage profile), would there be an alarm for plant operator to make adjustments and communicate back to ERCOT?
  - A15: Any alarms for plant operators to ensure they are maintaining Voltage Set Points and within +/- 2% would be handled locally by the GE and or QSE, consistent with ERCOT Protocols and Operating Guides.
- Q16: Can ERCOT share the validation rules used to for the operator alarm logic on QKNET?
  - ***A16: ERCOT can share upon request. There will be reasonability limits established based on the kV level and additionally, ERCOT will not allow a Voltage Set Point to be passed along that is outside of normal voltage limits as the bus.***

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- Q17: Will the object names sent from TDSPs to ERCOT be the same as those sent from ERCOT to the QSEs (and hence to the GEs)? If so, will this cause a problem during interruptions with SCADA?
  - ***A17: ICCP names at the generator will be different from those sent from the TDSP; they will follow QSE ICCP naming conventions as per the ICCP Handbook.***
- Q18: Who creates the SCADA_Only_Substations?
  - A18: The TDSPs will need to create the SCADA_Only_Substations according to their knowledge of the physical stations, units and POIs.
  - ERCOT will provide a template in the IMM/NMMS to enter parameters for the SCADA_Only_Substations.

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- Q19: What maintenance is required from TDSPs for the SCADA_Only_Substations and corresponding Voltage Set Points?
  - A19: It is anticipated that any maintenance to the modeling portion would be minimal and similar to any other modeling maintenance. The target Voltage Set Point will probably not require much maintenance either. The measurement being sent to ERCOT may have to have alternate measurements sent to the ICCP point being sent to ERCOT in abnormal condition (de-energized bus) so that ERCOT, QSE, and GE have the kV measurement being utilized by the TDSP.
- Q20: Are SCADA_Only_Substations by Units, by Station, or by POI? We have plants with more than one POI. Do TDSPs create a SCADA_Only_Substation for each POI?
  - A20: SCADA_Only_Substations can be created by POI when there is multiple GRs per POI and no chance of splitting buses or outaged buses that could result in more than one target for the multiple GRs. The relationship of the POI to the GRs would have to be provided.
  - If there is one POI within the Station the SCADA_Only_Substations and the POI are one and the same. If there are multiple POIs within a Station, then the SCADA_Only_Substation should be created for each POI subject to above logic.
  - If there is a chance for split buses or outage buses that could result in more than one target for the multiple GRs, then the SCADA_Only_Substation should be created by Unit (GR).

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- Q21: Can TDSPs create more than one SCADA_Only_Substations per Location? Sometimes we have more than one POI per Station (e.g. one POI at 138 and another POI at 345).
  - A21: If there are multiple POIs within a Station, then the SCADA_Only_Substation should be created for each POI. See A20 for additional consideration on multiple GRs per POI.
- Q22: If the same Measurement-1 is used for the SCADA_Only_Substation for different units will there be validation errors in the model?
  - A22: One Unit is represented by one SCADA_Only_Substation; more than one Unit is not to be defined per one SCADA_Only_Substation. However, one SCADA_Only_Substation, per Unit, can have multiple POIs and hence multiple Analog values and either one or many SetPoints (one SetPoint if it applies to all the POIs, but if the POIs have unique SetPoints, then each one has a SetPoint).
- Q22: Is ERCOT expecting three points per station POI: Set Point, primary and alternate (or secondary) analog values?
  - A22: No. In real-time - ERCOT is only expecting: (1) measurement (_KVM), (2) Set Point/Target (_KVT). ERCOT is not currently pursuing system changes that provide logic to select between an primary and alternate analog values. That switching would have to occur on the TDSP end to send the appropriate measurement being utilized by the TDSP to the ERCOT ICCP point.

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- Q23: So, where's the "backup" analog value? Our control room does not have an on duty State Estimator person who, if the kV analog value goes down due to normal outage, can switch to another voltage point. I think it would be done in the back office and take a day or so. This (difficult part) needs to be part of the ERCOT discussion too.
  - A23: ERCOT is not currently pursuing system changes that provide logic to select between an primary and alternate analog values. That switching would have to occur on the TDSP end to send the appropriate measurement being utilized by the TDSP to the ERCOT ICCP point. ERCOT would expect the TDSP to restore the kV measurement as soon as practicable and notify ERCOT and its GR that the measurement is unavailable.
- Q24: We don't have logic functions in our SCADA system. Where we had left this in discussion at VPWG was, to avoid ERCOT having to use logic functions in their SCADA, we would have two analogs. ERCOT said that if the Primary value "went bad", the ERCOT NMMS would default back to the Secondary. See past VPWG minutes.
  - A24: The SCADA_Only_Substation was created to handle this condition. For a given unit multiple analog measurement values can be defined. If the "primary" _KVM has a Quality condition of "Bad/De-energized", the alternative _KVM is used.
  - ERCOT is not currently pursuing system changes that provide logic to select between an primary and alternate analog values. That switching would have to occur on the TDSP end to send the appropriate measurement being utilized by the TDSP to the ERCOT ICCP point. ERCOT would expect the TDSP to restore the kV measurement as soon as practicable and notify ERCOT and its GE that the measurement is unavailable.

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- Q25: What units are required to be included in this change?
  - A25: Generating Resources rated at or over 20MVA - individually or collectively (e.g. a wind farm) - are required to provide VSS.
- Q26: Are the GEs required to implement the Desired Set Point Automatically (by Automatic control Vs. Manual Control) through their systems?
  - A26: There are No requirements to automatically implement the desired kV Set Point
    ERCOT recommends retaining the need for a plant Operator to adjust the values.
    Operating Guide Requirements for implementing Voltage Set Point instructions still stand in 2.2.10; a 5 minute response after receipt of the instruction.

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- Q27: Grid Voltage control has always been TDSP's responsibility. How would this change impact the TDSP voltage control responsibilities?
  - A:27 Maintaining voltage of the grid is the responsibility of ERCOT and the TDSPs, however maintaining voltage at the point of interconnection (POI) at the desired Voltage Set Point within the CURL of the unit required to provide VSS is the responsibility of the GE/QSE. So what is different now is that everyone will see the same kV measurement and the same target so everyone will be talking apples to apples. If a verbal instruction is being made prior to updating the telemetered Set Point, the operators can use the common measurement to coordinate the desired voltage at the POI.
  - TDSPs and ERCOT are currently required and should continue to monitor dynamic reactive loading on generators and adjust other static reactive resources on the transmission system to relieve high dynamic reactive loading on units. When a unit has their AVR 'on' and in 'voltage control mode' (plus droop/dead-band settings are set correctly), it uses its reactive capability to try and maintain the desired voltage. If the AVR is controlling a bus that is not the POI, the plant operator should have some indication if the desired voltage at the POI is not being maintained and make additional changes to its AVR Set Points to control to the desired (target) POI voltage.

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- Q28: The voltage reporting used to be a maximum/minimum value. Now it appears to be changing to a Voltage Set Point with a +/-% off of the Set Point. Is this correct?
  - A28: Rules remain +/-2% of the Set Point at the POI.
- Q29: Will the plant be required to telemeter a value back to ERCOT to verify that the plant is within the voltage requirement?
  - A29: No. They must meet the new Set Point within 5 minutes of a verbal or telemetered Set Point change.
- Q30: Will the plant now be responsible for making real-time adjustments to voltage settings, or will the plant still wait on a request from ERCOT before making any change?
  - A30: The plant was and still is responsible for making adjustments on its AVR or other reactive devices to control voltage at the POI to the Set Point.

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- Q31: What is the purpose/goal of this change, (*to help us ensure we understand the reasoning and the plant's responsibility with the proposed change*)?
  - A31: During NPRR 747 it was debated whether verbal instructions should be from TDSP to Plant, or to QSE, based on protocols.
  - NPRR 776 allows for verbal instructions to continue - however it will provide transparency of a single kV measurement and Target Voltage Set Point that all affected entities can see (TDSP, ERCOT, QSE and GE(plant)).
  - While NPRR 776 draws attention to the rules/protocols, the core obligations relative to voltage control have not changed.
- Q32: Who do we need to coordinate with (group/contact) to establish telemetry and test telemetry?
  - A32: kevin.mcgarrahan@ercot.com

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- Q33: Any specific additional points needed for split resources (two points for each QSE or one for master QSE appropriate)?
  - A33: We will only provide the new kVM and kVT to the Master QSE for the physical unit. Individual joint owners will not get a value.
- Q34: There was language in provided operating guides regarding AVR and PSS change of status being as soon as practicable (not the 30 minute NERC standard). Is 30 minutes still appropriate?
  - A34: That language is not directly relevant to NPRR776
  - It is meant to not have the entity wait until minute 29 to call.
    If an entity knows AVR will be back in service within 30 min they do not need to call immediately, but if over 30 minutes, they should call ASAP
- Q35: How do we know if a unit is committed to providing VSS?
  - A35: Protocols Section 3.15 (2) essentially identifies a 20 MVA threshold for Generation Resources which beyond 20 MVA are required to provide VSS.

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- Q36: What is the frequency that the telemetry expected to change, is it 5 minutes? 2% tolerance for performance?
  - A36: No change to current TDSP to QSE/GE instruction ***frequency***.
  - Unit must respond within 30sec of QSE Receiving kVT from TDSP, and reach Set Point within 5 minutes.
  - 2% tolerance is for performance and should essentially guide dead-band/droop settings within 2% to balance heavy movement of exciter or other reactive device switching and staying within the 2%.
- Q37: If instructions take the unit outside of the CURL, what are the expectations and communications from ERCOT?
  - A37: Contact ERCOT and/or the TDSP so that other reactive devices can be put into service to relieve the reactive loading first. In abnormal circumstances there may be a need for a VSS instruction to operate outside of the CURL, but this should be rare.


QUESTIONS
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