**MWG Meeting/WebEx Meeting Summary Notes**

May 16, 2018 9:30 AM - 14:10 (15:30 scheduled)

1. Mike S. of ERCOT summarized the state of current telephone lines (POTS) and wide area network (WAN) used in the ERCOT area for data purposes, including EPS metering.
	* Current POTS systems are going away as carriers chose not to continue investing in their maintenance.
	* The existing WAN connection between TDSPs and ERCOT can be used for the transmission of EPS meter data. No changes to WAN fees would be incurred for the TDSP to transition EPS meters from POTS to WAN.
	* There was consensus at the meeting in regards to the need to transition away from POTS due to carriers moving away from this technology, but there are important questions to resolve.
	* John C. of Austin Energy and Gabriel G. of AEP brought up a current issue regarding EPS meters on WAN. WAN does not allow third party access. Therefore other parties that have historically accessed EPS meters, i.e. resource owners, may not have access to EPS meters connected to the WAN.
	* Doug B. of BEC brought up the concerns of some remote sites not having access to the WAN.
	* **Action Item:**
		+ TDSPs and ERCOT compile a list of communication options for further discussion.
			1. Submit ideas/options to ERCOT by 7/1/2018.
				1. Submit to Donald.Tucker@ercot.com or EPSMetering@ercot.com
			2. ERCOT will compile the list and bring it back to the MWG for discussion.
		+ Based on MWG discussions on communication options, the end goal is to discuss updates to ERCOT Protocols Section 10.12.1 (b) in regards to standard voice telephone circuit communications.

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| **Current EPS Communications** | **Responses Received** |  | **Future EPS Communications Method (ERCOT to TDSP connection)** | **Notes** |
| Comms method | TDSP Count  | Reply | No reply | ERCOT WAN  | ERCOT WAN, TDM over IP, Cellular Carriers & POTS  | Wireless/ Cellular (see note 1) | (note 1) Cellular is a stationary type & wireless is company owned |
| IP only | 9 | 9 | 0 | 7 |  |  | 2 companies replies did not include a confirmation of the future communication method  |
| IP, POTs, Cellular Carriers | 6 | 6 | 0 | 4 | 2May also still have need to use POTS lines in some locations (see note 3 for additional methods) | (note 3) some points will use wireless/cellular | (note 3) Wireless/cellular research pending on ERCOT to TDSP connection method |
| POTs only | 7 | 6 (see note 5) | 1 | 3(see note 2) | 1 (see note 4) | 1 | (note 2) One response indicated they may use cellular on the back end(note 4) One response indicated TDM over IP was used on the backend and they were investigating the use of IP connections with ERCOT(note 5) one company still looking into future communication path options |

General comments received from respondents:

1. Working to allow access to 3rd parties utilizing the same IP connection that we use to talk to the meters, concept is under development
2. Use TDM over IP circuits to provide communications lines to meters.
	1. No longer rely on external carriers to provide POTS lines to meters
	2. This technology brings its own issues.
3. Looking into the use of IP to the meters.  The following concerns need to be addressed:
	1. ERCOT to retrieve data.
		1. Currently working with ERCOT on secure connectivity for meter data.
	2. Internal billing system to retrieve data.
		1. Control House network design to incorporate metering data.
	3. Customer ability to retrieve data.
4. Leaning towards using the WAN connection as communication link with ERCOT, while investigating the use of a back end cellular based communication technology for the “last mile” to some EPS Meters.
5. Preferred technology going forward is wireless / cellular as discussed below.
	1. The Companies Telecom group is in the midst of a company-wide “telecom refresh” initiative which entails modernizing our telecommunications systems to better meet the growing needs of transmission-related equipment such as SCADA equipment, RTUs, etc. – and to provide service in remote areas where POTs lines are not available or are cost prohibitive.  The plan is to “piggyback” on Transmission’s telecom infrastructure as this technology is implemented.  There will be a company owned 700 MHz proprietary wireless band to provide wireless communications to SCADA and other systems. We intend to use this system to provide communications to EPS Meters.
	2. In areas where this technology is unavailable, the services of a cellular provider that only serves industrial, non-mobile clients (not cell phones, but only stationary equipment such as that used in the electric utility and oil industry) has been secured.
	3. In situations where the aforementioned wireless technologies are not available or feasible, we would rely on traditional communications options: POTS and cellular via carriers such as Verizon and ATT.
6. Currently maintain the use of POTS lines for 3rd party access (any entity other than ERCOT)
7. To date we solved the third party access problem with POTS, which is not an ideal solution but eliminates any additional cyber security implications. In the future we will probably need to address the third party access with some different technology if POTS is not available.
8. Developing a network for use of ERCOT WAN communications for Distributed Generation sites located outside of substations is a challenge.
9. Preference to use the WAN connection for the transmission of EPS data but need to further investigate options to insure internal systems and 3rd parties can maintain access.
10. Have been successful with cellular gateways providing the final path to remote meter sites.
11. Concerns with third party WANs connecting to the company network in order for the third party to communicate with a meter. This results in a gateway installation that is not a VPN and relies only on the security of the gateway and meter.
12. Some sites will be difficult for eliminating POTS due to their remote location. Company is assessing MPLS over existing phone lines and efforts will be made to test connectivity by service provider gateways. Use of MPLS network technology over existing copper phone lines is being assessed. No current timeline projected for the results of the assessment.
13. Some sites do not have network connections available on equipment at the site.
14. We plan on changing the rest of our POTs communicating meters to IP based communications, but have no definite timeline.
15. Also have POTS lines to most meters, missing one right now, but installing a POTS line at this location. The POTS lines are used by third parties that request data from the meters and are available to ERCOT as a backup connection in case there are issues with our network.
16. Working on a solution that would/will provide ERCOT with IP access at the majority of our EPS sites. We are hoping to have a test site ready in the next couple of months. If successful we will continue to add sites, and get away from the dial up communications. Have a couple of remote sites that will require more work to provide IP access. After talking to our communications department, we are exploring ways to bring the data back into the company network and port it to ERCOT over the existing WAN. We are still researching these methods to ensure full security. Our goal is to be off of analog communications methods by the end of 2019.
17. Have been using TCP IP for EPS Meter Communications since 2010. Since TCP IP has provided reliable communications, we plan to continue using TCP IP.
18. I think the best option for our company is to go wireless either with a multilink device or a meter that has the capability of using cellular. We are still discussing options but we will be limited on what we can use due to very remote locations.

General comments on communication options:

1. Media Converter:  this will convert Ethernet to POTS. Basically the people that connect to the meter will use data retrieval software in a dial up fashion where meters are scheduled to upload every night.  Of course there needs to be coordination between ERCOT and any other company about who/time so the meters can be read.  This will work in a station with fiber/Ethernet available. The converter does provide enough voltage on the RJ11 input to allow the modem to answer.
2. If a meter only has 1 Ethernet available, then use a serial/Ethernet or serial fiber converter to give to the 3rd party with security set to read only for the 3rd party, but include time sync with password for ERCOT if used for ERCOT.
3. For stations with no LAN connection, may need to look at the terrain, and go with a cell modem (internal or external) or put a point to point radio system in place.  Some companies make modems with multiple ports, so you have a port for the primary, and a port for the secondary and can have the modem on a VPN.  Cell modems have a serial or Ethernet connection to the meter, so one could put two modems out connected with serial and Ethernet to keep networks separate if needed.