TDSP AMS Data Practices Matrix

| **Fact Sheet** | **Questions regarding LSE files** | **AEP** | **CNP** | **Oncor** | **TNMP** | **Notes/Comments** |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | **All TDUs are providing complete 96 Interval values**  | It is not acceptable to provide nulls for interval values and would be rejected at ERCOT. | It is not acceptable to provide nulls for interval values and would be rejected at ERCOT. | It is not acceptable to provide nulls for interval values and would be rejected at ERCOT. | It is not acceptable to provide nulls for interval values and would be rejected at ERCOT. |  |
|  |  |  |  |  |  |  |
| 2(a) | **TDUs trigger the estimation process when there are missing interval values or if the interval value does not pass VEE** | Yes | Yes | Yes | Yes |  |
| 2(b) |  **Are missing intervals provided as zero or estimated?** | Estimated | Estimated | Estimated | Estimated |  |
| 2(c) | **Describe the process for Missing interval values?** What data is used to perform the estimation? | See explanation in 2(f) | Methods:The MIM (Missing Interval Monitor) Process will automatically make 5 attempts over 5 calendar days to check for actual data and retrieve the missing data. Manual estimation will be necessary if systematic estimation is not successful. If actual data becomes available greater than 5 calendar days after the consumption date a proactive inquiry is necessary to see if the meter has actual data available. For CNP’s estimation routine see 2(f) CNP note on page 12 of this document..Note: "0" is a valid interval value if there is an associated power outage or de-energized event/flag. | For Residential, estimated interval values are shaped based on ERCOT load profiles.For Commercial, estimated interval values are shaped based on the most recent 3 like days of historical usage (actuals or estimates) available for the premise.  | The 2 week like day historical estimation process uses "like-days" from the designated reference week and Like-Day set. For example, if the data needing estimation is Tuesday data, and Tuesday of the preceding week is considered a Like-Day, then the corresponding intervals from Tuesday of the preceding week are used in the estimation. If there is data for both weeks the most recent week’s data will be used.  | See “California Historical Estimation” document from TNMP for more details.  |
| 2(d) | **Under what circumstances do you estimate interval values?** | Missing intervals for an active premise  | Missing intervals for an active premise An estimate will also be rendered for an interval during which a time change occurred (clock adjustment).  | Missing intervals for an active premise or data fails VEE | Missing intervals for an active premise or data fails VEE |  |
| 2(e) |  **What triggers the estimation process?**  | Any time there is a missing interval value or register read | Any time there is missing interval value or does not pass the VEE process triggers the estimation process CNP’s automated systems will **concurrently** attempt to retreive actual or missing interval data through CNP’s Missing Interval Monitor (MIM) processes for 5 days | Missing register read or interval values or the data does not pass VEE  | Missing register read or interval(s) do not pass VEE  |  |
| 2(f) | **Please explain the estimation process --method(s)** | Register Read available: Interval Gap Fill for intervals missing within a day.* 2 hours or less utilizes interpolation
* Greater than 2 hours utilizes averaging method. Averaging method - like days are used.

Register Read unavailable: Partial Day Estimated Process* Daily interval cut received, that contains less than expected 96 intervals; missing interval(s) include the first expected interval – e.g. starting interval.
* Daily interval cut received that contains less than expected 96 intervals; missing interval(s) include the last expected interval value - e.g. ending interval.

Full Cut Estimation – used when all intervals are missing for a day--If register read is available, current day consumption distributed evenly over day’s 96 intervals. --If does not have the register read or any intervals for the current day, the intervals from yesterday are used to estimate the usage. AEP Texas’ process will look back for up to seven days for data to fulfill the logic for this process. --If does not have the register read for the current day or intervals from previous 7 days, the current day’s intervals are filled with estimated zeros. | See Uniformed Business Practices (UBP) procedures\*\* See note at end of matrix for CNP’s detailed estimation routine/process. | Register reads are estimated by using available historical data to determine the day’s consumption. Current day consumption distributed per the load shape over day’s 96 intervals\*\* See note at end of matrix for Oncor’s detailed estimation routine/process. | 1. Linear Interpolation – used for intervals totaling 1 hr or less 2. 'California historical' Used for intervals totaling more than 1 hr. This process uses like day averaging to produce estimates. This uses the data from like days during the three weeks prior.3. If (1) and (2) are unsuccessful, then '2 week like day historical' estimation process is used, as described below.The 2 week Like day historical estimation process replaces intervals needing estimation with data from "like-days" from the designated reference week and Like-Day set. For example, if the data needing estimation is Tuesday data, and Tuesday of the preceding week is considered a Like-Day, then the corresponding intervals from Tuesday of the preceding week are used in the estimation. If the previous week is not available, the data from two weeks prior is used |  |
|  |  |  |  |  |  |  |
| 3(a) | **Do you provide Zero values for interval data? (Y/N) If so, what circumstances?** | YesNote: Zero is a valid value for both estimates and actuals | YesNote: Zero is a valid value for both estimates and actuals | YesNote: Zero is a valid value for both estimates and actuals | YesNote: Zero is a valid value for both estimates and actuals |  |
| 3(b) | **Describe the validations around Zero Interval Data if utilized** | Not performing daily zero validations at this time Following the UBP rule 1.6 (at billing) Zero Consumption for active meters | Consecutive zero validation will flag intervals with a failure code and/or will flag ESID on a Validation Failure Report. A manual review of the event log or CIS is done to determine if there is an associated power outage or an attributable event , if not a meter field investigation may be initiated. | Oncor performs data analysis checks for Zero consumption after disconnects or MVOs on ESIIDs and initiates additional review where deemed appropriateThe day after DNP completed, a validation is done to make sure the register read is the same as when the DNP occurred to determine if tampering/diversion has taken place.  | None at this time |  |
|  |  |  |  |  |  |  |
| 4(a) | **If you receive an actual for an interval that was previously estimated do you always replace the estimate?** | Only in the scenarios below:* AEP does not have a process that interrogates the meter for missing data that has not been previously sent.
* Actual data will replace previously estimated data only if it had failed in MDM because of the following reasons:
	+ System issues
	+ Failed validation process
* These are typically processed within 3 business days.
* Upon REP request, another attempt to collect actual interval data will be made if data is not greater than 45 days old and the meter is communicating.
	+ REPs should utilize MarkeTrak to alert AEP of the missing data after the **third consecutive day** of missing estimated data
 | YesExcept in the case of stopped (tampered or damaged) meter since these were estimated because the meter was not allowed to register the actual usage.  | Upon request by the REP Oncor plans to eventually automate a process to check for missing actuals and send to SMT and ERCOT.  | Yes, if actual reads are received within 70 days the estimate will be replaced with the actual read.  |  |
| 4(b) | **What is the timeline for replacing Estimated usage with Actual usage?**  | 1-2 business days- Once the REP initiates the “3-day” MT process and AEP is able to locate and re-process the data, then the Actual usage will replace the Estimated usage within 1-2 business days. | Up to 6 business days* 5 automated re-attempts to collect actuals, 24 hours apart
* Actuals obtained through an on-demand read will also replace an estimate, if one should occur
* Manual estimation will occur upon request
 | Dependent on the workload of the MarkeTrak team.  | Upon receipt of actual data. |  |
| 4(c) | **Anytime usage is updated how will that be reflected in the LSE file?**  | Date stamp upon replacement* New LSE files will be posted with the create date and time stamp of the LSE file.
 | Date and time stamp upon replacement; New LSE files will be posted with the create date and time stamp of the LSE file. | New LSE files will be posted with the create date and time stamp of the LSE file  | * Flagging update of actual data with “actual”
* Use of actual or estimated flag is used based on the RMG Appendix G: ERCOT Specified File Format for Submission of Interval Data for Advanced Metering Systems.
* Date and time stamp upon replacement; new LSE will be posted
 | **See Retail Market Guide Section 7 – located in 7.15.2 (2)**Website Link:<http://www.ercot.com/mktrules/guides/retail/current>  |
|  |  |  |  |  |  |  |
| 5(a) | **Is a Register Read always provided?**  | Yes. | Will not provide a register reading in the daily LSE file if the register reading has been estimated for more than (2) consecutive register readings. If the ESI ID has more than (2) consecutive estimated register readings, the register read data element will contain “NULL” (same as blank) until an actual register reading can be retrieved from the meter.  | Yes. Oncor’s defines a Register Read as any “5-dial” read of the meter odometer. For example, the start and stop reads on an 867\_03 are “register reads”. A “midnight read” is simply a Register Read that is taken at midnight. | Yes |  |
| 5(b) | **If provided, under what circumstances do you estimate Register Reads?** | When Register Read not received- AEP plans to add the SUM check functionality in the future | Will not provide a register reading in the daily LSE file if the register reading has been estimated for more than (2) consecutive register readings. If the ESI ID has more than (2) consecutive estimated register readings, the register read data element will contain “NULL” (same as blank) until an actual register reading can be retrieved from the meter.  | - When Register Read not received or fails VEE. - If the collection process successfully passes all the daily interval values, the MDM will calculate a missed Register read using the"96 good" interval values.- Estimated register reads are also provided when a cancel rebill occurs. The rebill register reads are used to manually calculate the interval adjustments. | When Register Read not received |  |
| 5(c) | **What is the validation process for Register Reads?** | UBP guidelines for monthly billing vs the register reads. Daily VEE is performed on the register read MDM | Industry standards for Validation, Estimation and Editing (VEE)  | UBP guidelines | UBP guidelines  |  |
| 5(d) | **How often is the validation performed for Register Reads?** | N/A | Each time data passes through the MDM ‘s cleaner process | During the preparation of each LSE file | As data is imported to MDMS |  |
| 5(e) | **What is the allowed variance between the sum of the interval data and the register read?**  | N/A- There are future plans to validate between the Sum and the register reads.- AEP will use the 2x meter multipliers the other TDSPs are using | 2 times the meter multipliers  | 2 times the meter multipliersThe 2 multiplier variance applies to both IDR and AMS and is an industry standard used for many years. Reasoning is based on the fact that register reads are never rounded up. I.e. A register read of 20.01 and 20.99 would both appear as “20” when the presentation is in integer format. In this scenario, the register read would appear to have ZERO consumption for the period between the start and stop read.  | 2 times the meter multipliers, based on the UBP Unbundled Electric Metering Appendix 5 Interval Data VEE rules, Section 1.4.3 Perform Check Sum Pass/Fail criteria on NAESB website. Variances are caused due to rounding. | **Link for the Uniform Business Practices (UBP) for Unbundled Electric Metering** [**http://www.naesb.org/req/req\_form.asp**](http://www.naesb.org/req/req_form.asp) **(see notes at bottom)** |
|  |  |  |  |  |  |  |
| 6(a) | **What reading do you use to complete a straight MVI?** | On-demand read at time of completion | On-demand read at time of completion | Midnight reads (going into the day) when available. This may be an actual register read or the estimated value from the daily VEE process, otherwise on-demand read | Utilizing midnight read |  |
| 6(b) | **What reading do you use to complete a MVI Force Off?** | Same read that is used for the forcing MVI | Midnight read when available | Same as the MVI process | Utilizing midnight read |  |
| 6(c) | **What reading do you use to complete a MVO?** | On-demand read at time of completion | On-demand read at time of completion | Same as the MVI process | On-demand read at time of completion |  |
| 6(d) | **Explain smoothing as it pertains to your entity.**  | per Tariff Section 4.8.1.4 – | per Tariff Section 4.8.1.4 –-CNP performs a manual query to determine if any actuals are available in the MDM-CNP's smoothing of usage **only applies to the Monthly Usage 867\_03 transaction** and not the LSE files. Note: CNP will look within our MDM system to verify if actual readings are available before invoking this smoothing process to the 867\_03 usage transactions.  | Smoothing applies to traditional meter estimation processes where a manual daily average is calculated when an assumed quantity of energy is deemed to have occurred and an adjustment is made in the cancel / rebill process. | Interval data is not smoothed at this time.  | **for reference:***Tariff Section 4.8.1.4 –**“When an Actual Meter Reading is taken after two or more consecutive months of estimation, Company shall allocate any over or under-estimated usage over the entire estimation period. The allocation shall be based on the average daily consumption for the Retail Customer for the period between Actual Meter Reads.”*  |
| 6(e) | **Under what circumstances is an 867 cancel/rebilled due to changes in AMS data (such as receiving an actual for a previous estimate)?** | None | None | None | None  |  |
| 6(f) | **How does Tampering impact the 867 vs LSE?** | LSE will not be updated- Any plans to follow CNP and Oncor processes?We would like to understand how CNP and Oncor are handling this. And how is this different than other scenarios that generate cancel/rebills? | Both LSE and 867 will be updated | LSE data may be recalculated following a cancel/rebill of an 867 Usage that is re-billed via 867\_03 is then put into LSE files and sent first to ERCOT and posted on ERCOT MIS for REP. Any files rejected by ERCOT are not posted to the REP’s ftp folder. | LSE will not be updated- TNMP does not update those now, but have plans to revisit this in the future |  |
| 6(g) | **How are Inadvertent Gains handled in regards to the LSE files?** | Daily REP of Record update to SMT will reflect ROR changes from IAGs  | LSE files are always sent to the CR of Record. LSE files will be resent where restatements are required due to the Inadvertent Gain. [See AMIT Issue 024 - OWG 115 Impacts of an Inadvertent Gain (IAG) on Interval Data (attached) where CNP's process has already been documented ] | Oncor does not provide LSE data after a production day(s) transmission as a result of an IAG event closure.  | LSE files are always sent to the CR of Record. LSE files will be resent where restatements are required due to the Inadvertent Gain |  |
| 6(h) | **Under what scenarios is a REP of Record Update sent to SMT, for each TDU?****Any differences for MVI, MVO, Switch? Or is the timing the same?** | Any REP of record change initiated by a TX SET transaction.Dependent upon when the 86703Final/86704Initial is processed; which triggers a REP of Record change file to be sent to SMT. | Any REP of record change initiated by a TX SET transaction.Dependent upon when the 86703Final/86704Initial is processed which triggers a REP of Record change file to be sent to SMT. Any gap days are provided as an LSE file when the 867 process is complete | Any REP of record change initiated by a TX SET transaction.Dependent upon when the 86703Final/86704Initial is processed which triggers a REP of Record change file to be sent to SMT. | Any REP of record change initiated by a TX SET transaction.Dependent upon when the 86703Final/86704Initial is processed which triggers a REP of Record change file to be sent to SMT. |  |  | Daily REP of Record update to SMT will reflect ROR changes from IAGs  |
|  | **How are Inadvertent Gains handled in regards to the LSE files?**Daily REP of Record update to SMT will reflect ROR changes from IAGs |  |  |  |  |  |  |  |

**2(f) CNP Note**

CenterPoint Energy’s estimation routine for AMS 15 minute interval data:

**Systemic:**

If section of data needing estimation is 2 hours or less in length, point-to-point linear interpolation is used to estimate the data.

Can be either:

1. Single interval to be estimated:  Estimated value used = ((interval value immediately preceding + interval value immediately following) / 2)
2. Greater than 1 interval/less than 8 intervals bound by register reads:  [Difference of the register reads (Ending Register – beginning register) less the sum of the actual intervals] divided by # of missing intervals.

If section of data needing estimation is greater than 2 hours, the first successful pattern found will be used.

[Limitation of 60 day look back; Residential attempts 2 days then 1 before moving onto the next pattern; Commercial attempts 3 days than 2 then 1 before moving onto the next pattern.]

1. Average usage pattern of ‘X’ same weekdays all actual data (defined as the same day of week)
2. Average usage pattern of ‘X’ like days all actual data (defined as the same day type)
3. Average usage pattern of ‘X’ same weekdays allow estimate values (defined as the same day of week)
4. Average usage pattern of ‘X’ like days allow estimate values (defined as the same day type)

If none are successful, the systems will exception the missing data for manual remediation.

If the missing gap is bound by two actual register reads, the difference of the registered usage will be applied to the missing intervals with the allocation based on the pattern identified.

If the missing gap is not bound by actual register reads, the pattern values will be used.

**Manual:**

Will be addressed by use of one of the following:

1. Manual estimation using actual historical data (greater than 60 days)
2. Manual estimation using estimated historical data (greater than 60 days)
3. Manual estimation using actual historical data from a nearby address
4. Manual estimation for special conditions (usually for external request)
5. Manual scaled with register

**2(f) Oncor Note**

If 1) TDSP Misses intervals early in the day:

And:

a) TDSP collects Actual Start Read and Actual Stop Read –

What does the TDSP do for the Register Read?  Oncor would have NO change to Actual Reads

What does TDSP do for the intervals values?  Oncor will estimate the consumption in the intervals utilizing the total consumption for the day from Register reads.

b) TDSP collects Actual start read but missed the Stop Read

What does the TDSP do for the Register Read?  Oncor will estimate the Stop Read and that sets the kWh for the day

What does TDSP do for the intervals values?  Oncor will use the kWh for the day and shape the interval values according to the ERCOT load profiles for Residential and Like day average shape for Non-residential.

C) TDSP Misses the Start read but Collects the Actual Stop Read

What does the TDSP do for the Register Read(s)?  Missed Start Read would be estimated at the conclusion of the prior day’s consumption.  The Start Read (yesterday’s stop read) may be adjusted today once the End of Day Read today is collected.

What does the TDSP do for the interval values?  The missing interval values will be estimated based on the Register reads at the end of today’s production.  Shaping the interval values will be done according to ERCOT load shapes for Residential and Commercial ESIIDs will be shaped based on the ESIID’s 3 like days prior.

The prior Day’s LSE data will be recalculated for any previous Register read estimated and the interval values reset to the adjusted consumption.  The re-estimation only occurs after a later day gets an actual Register read that passes validations.  That later production day LSE data will contain current consumption and each prior day that had estimates.  The recalculated values will be resent along with today’s LSE data.

d) Miss start - Miss Stop Read

What does the TDSP do for the Register Read? Oncor Estimates the Stop Register read for the day and uses previously estimated register start read which was the prior day’s “stop read”.  The total consumption for the day is estimated kWh.

What does TDSP do for the intervals values? Oncor uses the estimated kWh and Shape the interval values as described above.

2) Miss intervals in the middle of the day: a) – d) – This will be the same as the scenarios above for Oncor

3) Miss intervals at end of day: a) – d) same as the scenarios above for Oncor.

4) Miss all data for the day:    Oncor will estimate the Register Reads and the Interval Values will be shaped as described earlier



**Uniform Business Practices (UBP) for Unbundled Electric Metering – Definition for “Like Days”**

2.2. If the section of data needing estimation is more than 2 contiguous hours, use the average of selected reference days to estimate the data.

**Rules and definitions** for selecting reference days for estimation:

* “Same weekdays” are defined as the same day of week as the day that needs estimation. In the case of holidays, “same weekdays” are holidays.
* “Like days” are defined as the same day type (i.e., weekday, weekend, and perhaps holidays) as the day that needs estimation.
* A standard list of holidays should be used, regardless