

Guidelines for SEM data computation

- **Special Energy Meters (SEM) in WR:**
 - a. Details of SEMs installed in WR are available at <http://wrldc.org/data/MASTER.txt> . MASTER.txt contains following SEM details.
 - i. Meter ID
 - ii. CT Ratio
 - iii. PT Ratio
 - iv. Type of Meter
 - v. Location of Meter
- **Use Notepad to open raw Data, Processed and Entity wise SEM data files.**
- **Raw SEM data:**
 - a. As per IEGC 6.4.21 Encrypted SEM data from all concerned stations is sent to WRLDC every week by Tuesday for data validation and energy accounting.
 - b. Encrypted SEM data is decoded at WRLDC using software's provided by SEM vendors.
 - c. Decoded SEM data at WRLDC end is used for Energy accounting and is available in text files.
 - d. Decoded SEM data of all meters in WR is available at <http://wrldc.org/RawSemData/>
 - e. Raw SEM data is uploaded in website every week by Friday after completion of energy accounting.

The image shows a screenshot of raw SEM data with several annotations in red boxes and dashed lines pointing to specific fields. The data is organized into columns and rows, with a week heading and day heading. The annotations include:

- Meter serial number**: Points to the first column.
- Cumulative C Reg. for Active Energy**: Points to the second column.
- From date & time**: Points to the third column.
- Cumulative H Reg. for Reactive Energy under High Voltage (>103%)**: Points to the fourth column.
- To date & time**: Points to the fifth column.
- Cumulative L Reg. for Reactive Energy under Low Voltage (<97%)**: Points to the sixth column.
- Week heading**: Points to the line starting with 'WEEK FROM'.
- Day heading**: Points to the line starting with 'NP-0138-A'.
- Time of the Block**: Points to the first column of the data block.
- Average Frequency in the 15 min Time Block in an Integer Code**: Points to the second column of the data block.
- Active Energy in the 15 min. Time Block**: Points to the third column of the data block.
- Voltage Low Flag**: Points to the fourth column of the data block.
- Day total of Wh**: Points to the fifth column of the data block.
- Day heading for next day**: Points to the sixth column of the data block.
- Time Advance/Retard Flag**: Points to the seventh column of the data block.

Meter serial number	Cumulative C Reg. for Active Energy	From date & time	Cumulative H Reg. for Reactive Energy under High Voltage (>103%)	To date & time	Cumulative L Reg. for Reactive Energy under Low Voltage (<97%)				
WEEK FROM 0000 HRS OF 13-11-05 TO 0953 HRS OF 22-11-05									
NP-0138-A	00285.1	37994.0	00376.2	13-11-05					
00	56	-06.14	56	-06.00	58	05.78	...	63	-05.42
04	61	-05.42	53	-05.50	52	-05.62	...	60	-06.33
08	54	-06.93	54	-07.55	56	-07.06	...	53aa	06.69
12	56	-05.70	54	-05.77	58	-05.75	...	58rr	05.86
16	58	-06.78	52	-06.91	53	-07.01	...	55	-07.22
20	53 *	-16.59	56	-16.26	59	-15.76	...	60	-14.53-751.67
NP-0138-A	99533.4	37722.1	00376.2	14-11-05					

➤ **Processed Data:**

- a. Wh Raw SEM data is computed for actual values (in MWh) by applying multiplication factor.
 - i. Multiplication Factor(M.F)= (CT Ratio x PT Ratio)/1000000
- b. Inputs for M.F is available <http://wrlcdc.org/data/MASTER.txt>
- c. Weekly processed SEM data is uploaded in website every week by Friday
- d. Processed SEM data is available at http://wrlcdc.org/Commercial/Processed_SEM_Data/2016-17/ .
- e. Each .rar file contains seven folders in the format of DDMMYY.
- f. Each folder contains processed SEM data of all meters for a particular day.
- g. Format of file name pertaining to a SEM meter is NPXXXXA.MWH/GJXXXXA. XXXX is four digit meter id.
- h. Each processed data file (NPXXXXA.MWH) contains data in 16 rows, each row contains data of 4 blocks(i.e 00:00 hrs to 24:00 hrs)

➤ **Entity wise SEM data:**

- a. Entity wise Injection/Drawal data is available at http://wrlcdc.org/dropdown_semdata.aspx
- b. Each entity wise file contains
 - i. Master frequency data(In 2 digit Frequency code format)
Actual frequency = 49.5 + (Frq Code/100)
 - ii. SEM data of lines from which Injection/Drawal is computed
 - iii. Total Injection/Drawal of an entity
- c. Philosophy of Injection/Drawal Computation:
 - i. The sign convention of power flow recorded by meters is positive for power flow out of bus-bar and negative for power flow into the bus-bar.
 - ii. Net injection/drawal at any location is algebraic sum of meters (including sign) on all feeders/ICTs/GTs listed with that location.
 - iii. Net drawal of State Utilities would be algebraic sum of drawals at all the locations listed for that utility.
 - iv. Multiplying factor to be applied with standby meters is to compensate for transmission losses & would depend upon voltage level (1.5 % for 765KV, 2.0 % for 400 kV, 4% for 220 kV & below)

➤ **SEM Discrepancies:**

- a. Details of Discrepancies observed in SEM data during energy accounting is available at <http://wrlDC.org/Commercial/SEM%5FDiscrepancy/>
- b. Weekly discrepancy report is uploaded in website every week by Friday.
- c. Discrepancy report consists of following details
 - i. Details of meters replaced with standby/check meters due to non availability of SEM data at WRLDC.
 - ii. Details of meters replaced with standby/check meters due to discrepancy/under recording of main meter.
 - iii. Details of adjustments done in main meter data due to discrepancy in few blocks.
 - iv. Details of New elements synchronized, COD, SSP synchronous operation, CT/PT errors reported, Time drift, Master frequency.