USAID OD AMERIČKOG NARODA | Asistencija regulativi i reformi energetskog sektora

Data Processing

Tatjana Konjić

BiH REAP
Sarajevo, 19 June 2012

Bosnia and Herzegovina (BiH) Regulatory and Energy Assistance Project (REAP)
USAID Contract No. EPP-I-00-03-00004-00, Task Order 5
Implemented by Advanced Engineering Associates International, Inc.

This presentation is made possible by support from the American People sponsored by the United States Agency for International Development (USAID). The contents are the sole responsibility of the author/s and do not necessarily reflect the views of USAID or the United States Government.

Data processing:

- Data retrieval or ‘conversion’,
- Validation (verification) of the data,
- Data editing and
- Data archiving.

It is impossible to define the exact protocol for data processing!

Factors that affect the data processing:

- Type of metering system,
- Type of data collection system,
- Hardware and software for data processing,
- Load profile recording interval.

Load data can be collected through:

- Radio transmission,
- Telephone line,
- Energy line,
- Manual electronic readers.

Data retrieval

- Data retrieval or the process of conversion collects the recorded data from the field and combines it with the data that identifies the customer.
- The customer code is important in the process of connecting the information (from the field and general information)!!!
- Retrieval time depends on the manner of communication with devices in the field.

Typical data on the customer that are present in a database

- Name and address of the test customer
- Customer invoicing account number
- Operational unit of the company
- Special identification number of the test customer
- Identification number of the metering device
- KWh constant of the metering device

Typical data on the customer that are present in a database

- Beginning of reading of the metering device
- Final reading of the metering device
- Date and time of beginning of data collection
- Date and time of beginning of data collection
- Calculated kilowatt hours necessary for collection periods
- Capacity (kW) per interval for the period of collection

Errors in metering process and data retrieval

- Faulty lines between meter and the collector,
- Incorrect pulse constants of the meter or collector,
- Errors in recording of the data, date, and time of access to the data,
- Exceeded memory capacity in the device,

Errors in metering process and data retrieval

- **Error in registering the blackout at the customer's/the device,**
- **Inadequate integration of the data on customer profile from the reading period which results in data overlapping or data gaps.**
- **Incorrect programming of the device.**

Common inspection measures

Checking measure	Purpose of checking
Identification of meters and identification of customers	• Meter ID and customer ID are properly registered • The data is properly shown for the meter and customer
Checking of impuls overuse	• Proper meter factor • Properly dimensioned transformer • No hardware problems
Checking of consumption by comparing registered impulses with the consumption in the given period	• Functional channels between meters and registration device • No problems with impuls transmission • Correct ratio of voltage and current transfomers • Correct meter settings
Checking of peaks	• No errors is data transmission • No peaks in meter testing
Checking of large/small consumption	• Correct meter settings • No energy abuse • Meters are not „fast“ or „slow“ • No voltage drops

Data validation

- **Represents identification of the error in metering and the retrieval process which can result in the collected data not reflecting the actual behavior of the customer.**
- **Visual review the reports on the collected data**
- **Graphic visual of the data**

Initial review of the data can include:

- Comparing the number of intervals that are collected with the number of expected intervals
- Sum of loads per interval and comparison of results with the meter reading
- If the validity verification for a certain reading period shows that the total kilowatt hour registered on the meter and the values received based on the registered capacity in certain intervals are within ±1-2% the data on the customer can be accepted without further checking. (?????)

Data editing

- **Editing is a process that can help with:**
  - **Correcting the data where the error is easily noticeable or**
  - **Completing the incomplete requests.**
- **Editing of the data can be done in any phase of data processing, depending on the manner of data collection and organization of the work.**
- **Person/team that does editing needs to decide whether to accept/edit or reject the data**

Data editing

- In the process of data editing, special attention should be given to the following
  - That the data is not "over-edited",
  - That the customer's load curve is not shaved or
  - That an artificial load peak is not formed.
- The data identified as incorrect or missing can be replaced with
  - The data that match the same day and hour of a similar customer,
  - The data that match the same day and hour of the same customer from the previous week,
  - by the average value of the data for the same or similar customer.

Data editing

- **Records on malfunction on the equipment should be carefully recorded and submitted**
  - **To the LR team as soon as possible so that it can be decided whether to accept or edit the data and**
  - **The team in charge of maintenance of the metering equipment so that the malfunction can be fixed.**
- **The edited data should be marked and/or additional comment should be provided**
- **After the editing is done it is necessary to once again check the data before they are finally adopted for further analysis.**

Data storage/archiving

- **Data storage/archiving original data bases,**
  - **Edited bases with comments and**
  - **Final bases for the analysis.**
- **On-line data storage - Mainframes – risk from loosing the data and is time consuming for large databases**
- **Off-line data storage – old data - archives**

Summary and recommendations

1. Ensure easy connection of data from the field with the general data on the customer. Customer code!

2. In the first iteration of the LR project, validation and editing can be done manually. Process automatization is recommended in the further development of the LR project.

3. Very low/high values and the missing data must be registered by checking the report and the graphic visual of the customer‘s load.

Summary and recommendations

4. **Check:**

   Total kWh from meters with border values ± (1-2%) P·t

4. **When editing 'bad" data they need to be compensated with similar load data (hour, day) or counting the average load values.**

6. **EPs should define which customers need compensation of the data.**

   Most often, those are the customers with significant consumption and load.

Summary and recommendations

7. **Before final acceptance of the data for the analysis, the edited data should be checked in order to determine that the compensation of the data was done correctly.**

8. **Edited data should be marked. It is recommended to write comments when correcting data.**

9. **Original and edited data are kept in separate databases.**

Summary and recommendations

10. It is recommended to continuously review and edit the collected data.

11. Enable on-line data archiving so that different users could access them.

12. Form and store offline historical data.

Summary and recommendations

13. All databases must be archived on at least two computers for safety reasons.

14. Think about forming reference data base that will enable connection of the existing data and the data edited in the field with the demographic data that are to be collected in the future period.