

COMMERCIAL DISTRIBUTION LOSSES IN JP EPBiH AND THEIR MANAGING IN LAST TEN YEARS

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1. DESCRIPTION OF PROBLEM AND CASE ANALYSES

After the end of the War in Bosnia and Herzegovina ('92-'95), JP Elektroprivreda BiH faced the big problem due to magnitude of damages of the installation. Rightly, there was the expectation for the company to establish normal functioning of the electricity system, to enable the minimum of living conditions for the citizen's, and necessary energy for industry function. Beside all other problems, insuperable problem was lack of the financial resources required for rehabilitation of the installation and coal and oil payment needful for the power plants functioning. In that time considerable present International community was willing to help in rehabilitation of the installation (donations or credits), but not willing to help for supply of energy sources needful for the power plants functioning, and other company function expenses. There for, the management faced a big task of establishing efficient collection system for delivered electricity as practically the only goods had at their disposal.

At that time made analyses gone at to directions:

- How to find the efficient method for collection of delivered and invoiced electricity
- How to solve the problem of enormous electricity distribution losses, hence, for delivered but not invoiced electricity

Solution of problem of efficient collection for delivered and invoiced electricity is not a subject of these analyses (was solved with enviable collection degree of over 96% invoiced electricity), yet, we will be occupy with solution of very interesting problem enormous big distribution losses.

Comparing the result of measurements at the threshold of production and the end users, there was found the incomprehensible information of more then 30% electricity losses (in some distribution regions more then 42%). The main reason was a war and its after effects, everybody was aware of that, but responsible management was asked to give the answer WHAT (concrete) is the basic problem, and WHAT (concrete) needs to be done to eliminate it. Specific pressure was made from the foreign experts, that time present in Bosnia and Herzegovina, and they permanently requested for salvation of this problem. Advantage was given opportunity to the interested managers in JP EPBiH to be enabled thru the visiting of different power supply companies around the world to get a sense of "how the others do it". Assuredly, similar situation like in Bosnia and Herzegovina right after the war was difficult to find any were at the world, but worthiness of direct contacts and exchange of experience with colleges from the companies occupied in the same activity was invaluable. Visits in North America, England, Sweden, Belgium, France, Spain, Austria, German, and some other countries, showed that practically, all companies have more or less the some problem with electricity distribution losses.

Although, among the managers were those who problem they faced will rather described as "enormous increasing of technical losses as a consequence of war damages EES", burden of situation in which we were, due to financial problem, did not allowed that. Hence, there was approach to analyze the real causes of extremely big electricity losses and finding the solutions from unbearable situation. All calculates of technical losses (by donated applications TOKSWIN and PRAO) showed that technical losses made up to 10% of all losses. Estimation of the experienced distributors was similar, taking in account that the major part of rural area (remote villages) was not provided with electricity due to devastation of network. So, everything indicated that our biggest problem is indeed in the so-called "commercial losses" in other words delivered but not measured (invoiced – tamper use) electricity.

Simultaneously with present situation analyses there were made estimations of the sources of the problems. According to that time estimations, cognizable sources of losses should be:

- big inhabitation migration and not having of the information of real users of electricity;
- destruction or alienation of electricity meter;
- stealing of electricity using various methods.

There was need for definition of method for struggle against noticed negative appearances.

2. WORK ORGANISATION FOR DECREASING OF COMERCIAL LOSSES

As ordinary organization in company didn't give opportunity for considerable effects in short period, it was resort to project working system. Namely, competent managers (Directorate for distribution) were asked to introduce concrete, elaborate plan of action with accurate and timely defined measuring result points.

That time introduced and from EPBiH authorities accepted plan of action, was content with several key actions:

- introducing continuous reading, processing and distribution of electricity bills to customers (with reading and distributing period of one month);
- introducing of unique electricity losses statistic for all part of electricity distribution in EP BiH;
- keep a records of all unrecorded customers;
- built in all commutation points the electricity meter (intercantonal, interchange between Elektroprivreda HZ HB and Elektroprivreda Republike Srpske);
- embed the electricity meter to all customer where reckoning was by lump sum;
- change the bad electricity meter;
- logical consumption control;
- training for key activities on decreasing of electricity losses (logical consumption control, protection and controlling of measuring points; ...)
- Introduction of QS procedures and manuals;
- maximum use of information centers (Department for electricity customers) in electricity distribution parts of JP;
- introduction of new universal application for counting and collection of electricity;
- form the AUDIT groups in Distribution Direction for supervision of quoted activities in practice with definition of correction actions;
- stimulation for employees working on detection of unauthorized use of electricity;
- stimulation and discouraging for organizational units (prior for the bureaus working with customers) on base of extent of losses and money collection for electricity use.

Along with "functioning system changes" like introducing of completely new model of reading the electricity meter, it was necessary to appoint the clear mission to the regional managers, that, in accordance with the nature of their job, have to be the bearer of activities. And mission was nominated with unique form: "In front of you are the clear methods, apply them or resign". There were introduced the simple monitoring methods for court activities with purpose to prevent "fog of situation".

Project organization implied introduction of "task force" in the centers of the regional distribution parts and establishing a special team at the level of Directorate for distribution, employed only with solving this problem.

Later analyses approved that this approach to job organization was correct.

3. DESCRIPTIONS OF SOME APPLIED METHODS OF WORK

As we can see from described activities, which included operative plan, most of these activities has already been applied and known. However, there are few activities, which were where complete new in contrast to our prewar praxis. Therefore, we will now try to elaborate them:

3.1 Implementation of continuous system of reading and accounting of electrical energy

Before the War in Bosnia and Hercegovina in JP EPBIH was applied periodical system of reading of electrical meters at customers. The compulsory periods were by change of season, change of price of electrical energy and by the end of year. The readings were done by almost every worker regardless to their working places and ordinary activities because of necessity to read all meters in just few days. This praxis has included many problems as:

- Large number of false readings
- Large number of electrical meters which were not read at all
- Neglecting of ordinary activities because everyone was occupied by reading of meters
- Large number of citizen's complaints and necessary additional activities for "correcting errors"

Because of this, we were faced with hostile feelings among customers and our workers.

Therefore, the management decided to implement completely new way of reading el. meters – continuous reading of meters by professional workers which were specialized in this area of work. This model is quite simple. The professional readers continuously read in advance planned reading areas in accounting period. Of course, this model was "copied" and is applied in many electrodistribution companies across the world and its main advantages are:

- The professional readers are much better solution then the reading by all workers. Trained and motivated professionals make significantly less error and are able to collect many important field information (not read meters less then 0,5%, and complaints on read meters less than 1%).
- It is not necessary to organize the "large accounting actions" because the accounting is also continuous. It can be done in regular working time with small number of workers and optimal use of computer equipment.

We decided to use monthly reading period because all analysis that we have made showed that it necessary to do so. As the sequence of reading areas had to be the same, it met that the meters had to be read almost at the same date in every month (+/- one working day). Therefore, the accounting period for each customer was 30 days. For some customers it meant that their accounting period was from 1st day in month to 1st in the following month, and for someone else it was from 19th to 19th in the following month...

As the professional readers also delivered bills, it meant that every reading point had to be accessed twice a month, which was our goal. The trainings of professional readers were continuously done in order to register irregularities at reading point.

3.2 Implementation of logical control of consumption

As the implementation of this model of reading and accounting of electrical energy made possible to collect correct, real information of monthly consumption of electrical energy at each reading point, we came with the idea to use these data as best as we could.

The special expert team analyzed different situations in real life in order to define some "logical norms of the consumption". For example, what can be treated as the normal consumption of electricity of one family with four members in December in a flat with gas heating? Or, what is the average consumption of a gas station during the summer months?

We made approximate estimations of the logical consumption for different categories of customers. After that, we've formed a new working occupation "logical controllers" for which we picked the most experienced workers in the distribution who analyzed consumption of all consumers. They do this job on a regular basis and their duty is to come up with a list of illogical consumption. For the illogical consumption there is often a logical explanation, but according to our experience, they often implicate on irregular metering of the real consumption (nonfunctional electrical meters or illegal use of electricity).

Logical control of consumption by the trained and motivated professionals came out to be very effective way of guiding field teams to disclose irregularities in metering of the electricity.

We've formed special field teams trained to disclose irregularities at the metering points. We knew that there is large number of causes for metering errors but also relatively simple methods for their detection.

The table to illustrate implemented activities in a previous period, which can show quantity and type of work done:

THE DATA ON A LOGICAL CONTROL DIVIDED BY DISTRIBUTION COMPANIES FOR A PERIOD FROM 21.09.1998 TO 31.01. 2002

Period (21.09.1998 to 31.01. 2002)	The number of orders for a control of customers	The number of actually controlled customers	The number of irregular measuring –solved irregularities	The number of regular measuring and delivered bills	The number of reading errors and solved problems	The number of found unauthorized consumption	The number of paid bonuses for a founding of unauthorized consumption	The number of controlled customers who were disconnected in a previous period for a different causes
1	2	3	4	5	6	7	8	9

E D B I H A Ć

The number of customers: 84.529

Sum	81.300	77.653	3.846	65.009	868	1.456	1.350	4.471
%	96,18	95,51	4,95	83,72	1,12	1,88	92,72	5,76

E D G O R A Ź D E

The number of customers: 10.456

Sum	7.330	7.290	268	6.394	63	154	93	513
%	69,47	99,45	3,68	87,71	0,86	2,11	60,39	7,04

E D M O S T A R

The number of customers: 30.263

Sum	40.797	35.924	2.820	26.940	647	510	356	5.080
%	129,85	88,06	7,85	74,99	1,80	1,42	69,80	14,14

E D S A R A J E V O

The number of customers: 166.468

Sum	124.557	118.040	5.711	100.806	1.131	2.712	2.523	6.569
%	74,82	94,77	4,84	85,40	0,96	2,30	93,03	5,57

E D T R A V N I K

The number of customers: 48.093

Sum	51.445	49.903	1.762	43.941	331	961	728	3.841
%	103,82	97,00	3,53	88,05	0,66	1,93	75,75	7,70

E D T U Z L A

The number of customers: 154.559

Sum	79.608	75.809	9.022	56.347	2.572	1.130	487	6.120
%	50,32	95,23	11,90	74,33	3,39	1,49	43,10	8,07

E D Z E N I C A

The number of customers: 120.437

Sum	68.014	62.289	2.916	52.095	2.874	865	521	3.580
%	56,70	91,58	4,68	83,63	4,61	1,39	60,23	5,75

Legend of percentage:

- column 2** The number of orders for a control of customers to a total number of customers
- column 3** The number of actually controlled customers to a total number of orders for a control
- column 4** The number of irregular measuring to a total number of a controlled customers
- column 5** The number of regular measuring and delivered bills to a total number of a controlled customers
- column 6** The number of reading errors and solved problems to a total number of a controlled customers
- column 7** The number of found unauthorized consumption to a total number of a controlled customers
- column 8** The number of paid bonuses for a founding of unauthorized consumption to a total number of found unauthorized consumption.
- column 9** The number of controlled customers who were disconnected in a previous period for a different causes to a total number of a controlled customers

3.3 The establishment of SQ documents

All those who tried to solve much more complex problems in a company's work, as in our case the increased commercial losses in distributive parts was, know how difficult it is to implement an idea in to action adequately. There are always problems in understanding of orders and solutions coming from "bosses". The different understandings of decisions of management were constant, no mater how detailed they were.

Because of the described "communication problems" we decided to establish a method of making a detailed System Quality documents (SQ). Numerous procedures and directions were written as SQ documents, which resulted enormous advantages as:

- The processes were described by the most creative and most interested managers,
- The System Quality philosophy understands a possibility to measure effectiveness, correct errors and continuously control the described process,

- The simplest, cheapest and most effective way to make changes is to change the existing SQ documents.

3.4 The way to motivate an employee to discover a fraud by a customer

One of the biggest problems, which we have encountered over and over again, by the revealing the frauds by a customers (stealing an electrical energy) is the motivation of an employee for such activities. It has been a continuous practice not to characterize frauds as criminal actions but to find a way to justify them. Rumors as "it was an electrodistribution employee who did these illegal actions" were often because "who else knows how to do something like that".

And indeed, how to motivate those "who don't want to antagonize with citizens"? Considering this problem, we came up with very complex system of stimulations of employees who were involved in the process of revealing the frauds (logical controllers, field controllers, readers ...). This system was continuously upgraded in order to really motivate those from whose concrete results the results of entire process depended. Our analysis of revealed cases of fraud showed that over 70% of such actions customers make on metering point behind the electricity meter board or at the attic. It was necessary to find an effective model to motivate employees, who work directly on these cases, to make their best (for example to clime to the attic, reveal the spot of the fraud and to put up with customers unpleasant feelings). Without the concrete material stimulation of the employees on such cases, the results simply fail.

4. THE RESULTS OF THE UNDERTAKEN ACTIVITIES

Along the mentioned operative plan for the reduction of losses, which was made, adapted and implemented in 1997, we have made another two similar operative plans in order to correct the perceived irregularities and further lowering of electricity losses. Comparison with effective companies in west European countries, whose electricity losses were between 5-7% in relation to total consumption, was continuous motivation for us to perfect our work. From already mentioned 30% losses of electrical energy in 1996, we came down to 9,02% in 2005. Annual "savings" for JP EPBiH are not very difficult to calculate.

Certainly, the results are still not as good as we would want it and as it could be but we are positive that we know where the real problem lies and how are we to solve it.

5. THE CONCLUSION

The commercial losses of electrical energy are large problem of distributive companies in our surrounding. Dealing with this problem largely influences the effectiveness of public service of distribution of electrical energy. Our experience shows that to purposely or unpurposely cover up the problem by presenting technical losses unrealistically high does not lead to the solution of the problem. It is necessary to apply different and already verified methods of identification of real causes of commercial losses and to have willing management to effectively solve this problem.

It is interesting to mention that only in few cases we had to appeal to resolving the responsible regional managers of their duty for not presenting the expected results. Namely, most of the managers came up to be able to solve even the most complex problems if they have clearly defined aim and methods of work.