

New Meter Test Equipment and Current Transformer Test System for Mongolia Electricity Company

The Mongolia Electricity Distribution Company found technical losses and excessive non-technical losses in their electricity distribution system. The reasons for these losses are:

- Low accuracy of their test equipment for testing electricity meters and current transformers
- Low accuracy of the electricity meters
- Low accuracy of the current transformer in the field
- Incorrectly connected meter in the field
- Misreading of the meter register's in the field

Electricity companies lose a lot of money due to these reasons. An analysis showed that in the distribution system, the losses can be up to 33% and at the Aimak electricity distribution companies the losses were as high as 50%. Aimaks are Mongolia's Electricity regional administrative districts.

The Mongolia Electricity Distribution Company decided to reduce these expensive costs by implementing the following policies.

- Investment in new test equipment
- Checking of the meter installation whilst putting into operation
- Periodic accuracy checks of the meters in the field
- Implementation of an efficient meter management
- Implementation of a training program for all employees

The Government of Mongolia had received a credit from the International Development Association for the project of, "reducing cost for non-technical losses"

The project was focused on Ulaanbaatar electricity Distribution Company and on the Aimak.

First step was to set the meter laboratories into a position for checking the meters accuracy in accordance to international standards.

Second step was to put in place a program to check all the existing electricity meters, 200,000 single phase household meters 20,000 three phase meters. All meters are of mechanical type and more than 15 years old.

Third step, with the aid of the credit from the World Bank to the Government of Mongolia, was to reduce the non technical losses by purchasing 106 thousand tariff and non-tariff electronic household meters class 1.0 and three phase electricity meters with class 0.2 - 0.5. In the meantime the installation of these meters has started.

For the first step the project management wrote an international tender for new test equipment. MTE, the leading company for meter testing in the world won the tender for the supply of stationary and portable meter test equipment plus a current transformer test system.

Within a very short period MTE had delivered and installed at Ulaanbaatar Electricity Distribution Company in Ulaanbaatar:

- **Two 10 position poly phase automatic meter test systems** for the simultaneous testing of 10 electricity meters. The automatic meter test system has an overall accuracy of better 0.05%, the test procedures are fully computer controlled and also provide report printing and data storage.



- **Four portable three phase meter test equipment PTS 3.3** for onsite testing of electricity meters. The PTS3.3 is a three phase voltage and current source plus reference standard with an overall accuracy of better 0.05%. Automatic test procedures are created and stored in the PTS3.3. The PTS3.3 also has the facility to store the onsite measuring results.

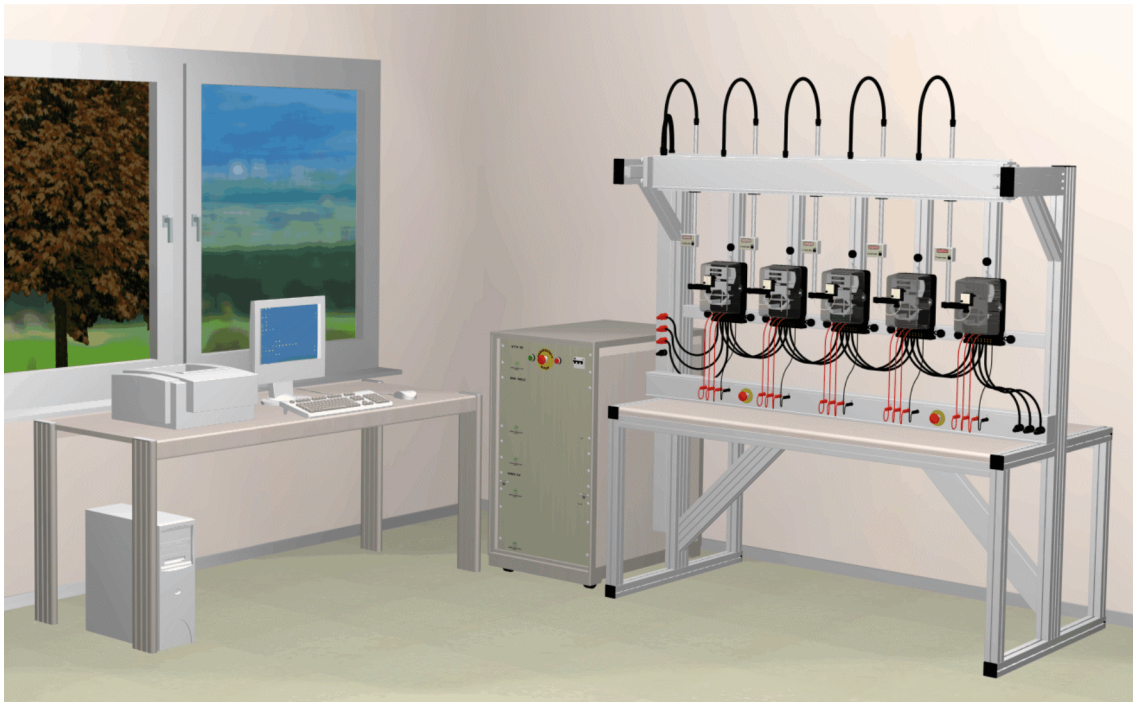


- **One Current Transformer Test System** for the testing of Current Transformers up to 1000A.



Also MTE has delivered and installed at different Aimak in Mongolia

- **Seven 5 position poly phase automatic meter test systems** for the simultaneous testing of 5 electricity meters. The automatic meter test system has an overall accuracy of better 0.1%, the test procedures are fully computer controlled and also provide report printing and data storage



These seven test equipment are installed at different Aimak in Mongolia

In March 2004, the engineer's of MTE, Messrs. Peter Kurth and Roland Bucher installed at Ulaanbaatar electricity Distribution Company the two 10 position meter test equipment and the current transformer test system.

The MTE engineers trained the laboratory staff of Ulaanbaatar Distribution Company and Aimaks in operation of the systems, service and maintenance of the systems. In addition, the Aimaks were trained in the installation of the systems after arrival in their laboratories.



A certificate was presented to each participant of the training course.

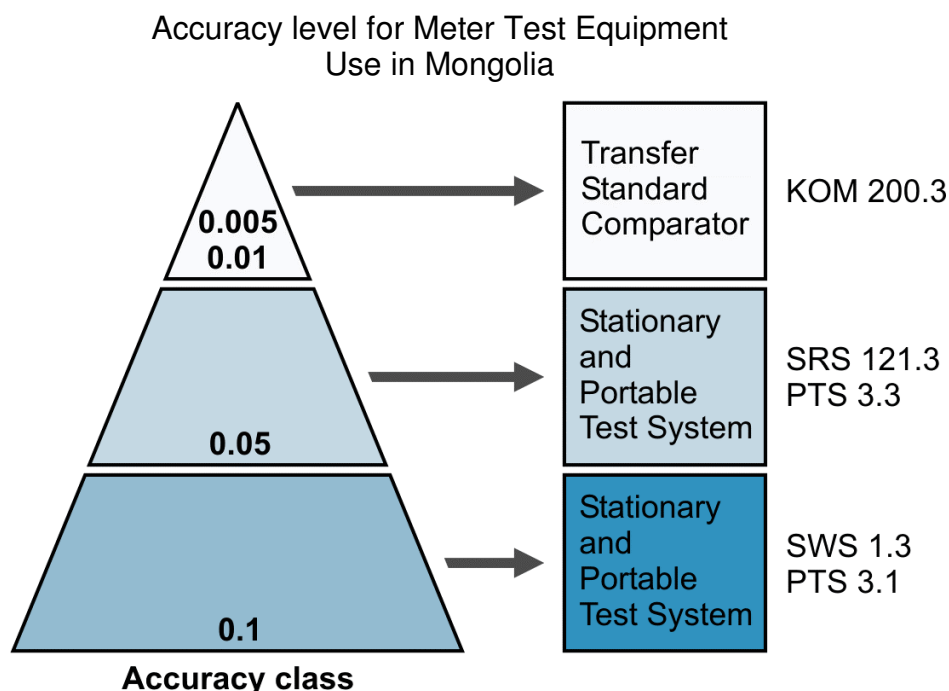
Also the Mongolian TV visited the training course in Ulaanbaatar. In the evening news the new MTE meter test systems were explained to the viewers to give more information about meter testing with high accuracy to confirm good quality meters in the field, so the customer can trust the billing of the electricity company.

In addition, all the meter test equipment at Aimaks have been installed throughout the country of Mongolia spreading sometimes up to 1500km away from Ulaanbaatar.



The trained employees are working now very well on the MTE meter test equipment and are testing not only the old mechanical meters but also new electronic meters. Today they know the advantages of fully electronic, computer controlled test system manufactured by MTE – the world leader in meter testing - against the conventional manual operated transformer based systems.

The accuracy of the test equipment has been checked by the National Center for Standardization and Metrology (MNCSM) of Mongolia. This is the national authority responsible for the implementation and monitoring of national standards which includes ensuring traceability of standards and metrological uniformity in the country. The MNCSM standards for energy measurement are traceable the international standards. This has been confirmed by using a comparator KOM 200.3 delivered by MTE which was calibrated at PTB, National Physical Laboratory of Germany.



With the comparator KOM 200.3 Class 0.01 and a power supply system for generation voltage and current together with calibration software from MTE, MNCSM has a fully automatically calibration station. With this computer controlled station, all national reference meters can be calibrated. Also with the system MNCSM carries out type testing of electricity meters and other reference standards.

This test system has been realized in close cooperation with MTE. Training for the equipment and calibration software was provided by MTE engineer's in Germany and in Mongolia.

The accuracy of national standards and meter test equipment has now reached international level with traceability to international systems. This is why the MNCSM gives great importance to the project.

The MTE Meter Test Equipment and its official distributor Ultrasonic Co. Ltd began its activity in Mongolia in March 2002.

Nowadays the meter test systems of MTE are very popular in Mongolia and have a good reputation due to high quality and effective test and calibration systems.

Together with MTE the measuring technology in meter testing has been changed rapidly in the last years in Mongolia.

In the last months, electricity transmission and distribution companies and also from Aimak test centers have bought several portable three and one phase test systems from MTE Meter Test Equipment.

Biography: N. Bayarmagnai

Graduated 1984 in former GDR at the TU Ilmenau, Dipl.-Ing.

1985-1994 Engineer, director of department in National Centre for Standardization and Metrology

1994-1996 President of Mongolian Instrumentation Society

1996-2000 Chairman of MNCSM

From 2001 General Director of Ultrasonic Co., Ltd

Ultrasonic Co., Ltd is a consulting company on the field of:

Standards, Instrumentation and automation

Energy saving technology

MSTQ sector

Peter Kurth

Chief of Service department and project manager at MTE/EMH

Experience in the field of meter and transformer testing systems since 1979