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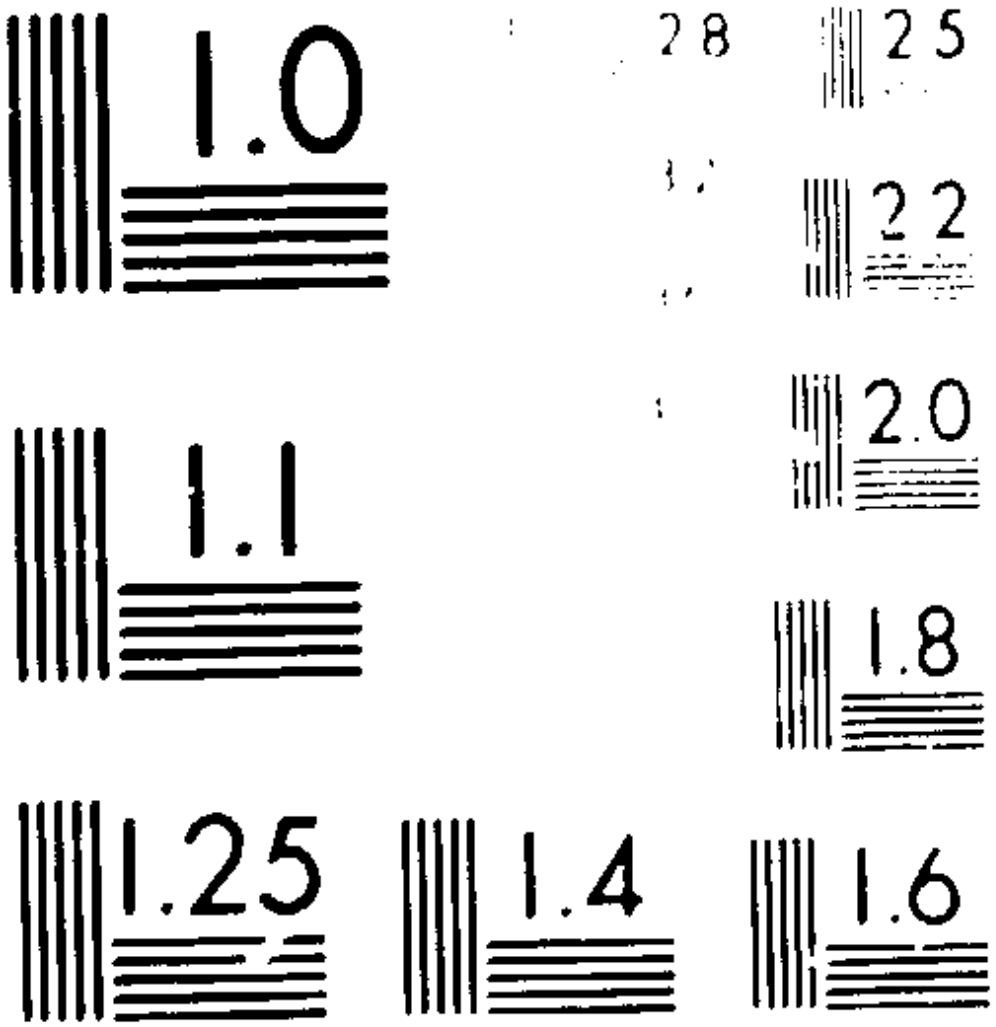
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MICROHYDRO STATION FROM THE SOCIAL REPUBLIC OF ROMANIA EQUIPPED WITH TURBINES OF ROMANIAN PRODUCTS*

by

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Romania Looks To Micro Hydro

In the Socialist Republic of Romania, the capacity in the hydro electric power plants and their annual production of energy had been developed as it follows :

	Installed capacity (MW)	Annual production of energy (GWh)
1950	60	170
1955	100	320
1960	210	400
1965	460	1000
1970	1200	2770
1975	2630	8700
1978	3100	10600
June 1979	3200	5700 (only half an year)

As it is seen, for the present, the installed capacity in the Romanian Hydro electric Power Plants is of 3 200 MW with an annual production of energy of about 11 000 GWh, which represents about 20% of the energetical production of the country.

It is appreciated that the potential energy of the small hydro (max. output of the station - 1 MW) represents a value of over 5% out of the technical hydro potential of Romania which is more than 40 GWh annual production of energy

There is no official definition for the micro

hydro station and no settled terminology. More of this it had been conventionally established that a micro hydro station means that station which installed capacity does not beyound 1 MW.

Up to now in Romania had been built a rather reduced number of micro hydro stations, most of them were built before the Second World War. The greatest part of these were no longer used, especially after the implementation of the National Energetical System, because the energy produced by the system was more profitable and superior from the calitative point of view.

Latelly, when petroleum was no longer advantageous for producing energy, appeared the neccessity to develope the construction of the micro hydro plants. In this direction, several micro hydro plants had been built equiped with groups of romanian products (for example : the micro hydro plants Belci and Călugărița - annexed sketch).

Herewith enclosed is the romanian outlook for these micro hydro plants as well as a simplified idea which has to be addopted for the future for these plants. It is shown at the same time the diagram of the standardized romanian turbines which will be used to equip a great number of micro hydro plants.

The foundamental principles of their implementation are the following :

- in the first stage, the micro hydro plants will be built beside the existing arrangements which do not impose

great investments ;

- the micro hydro plants will be connected to the local electrical system at the tension of 2o kV ; the electrical connections will not be too long (2 - 3 km). In case of necessity, the micro hydro plants can also directly supply the local consumers at the tension of 0,4 kV.

- asynchronous generators (0,4 kV) will be equiped which are durable and achieve a simple electrical scheme.

- the rated discharge of the micro station is taken as 1,5 to 2,0 the figure of the medium flow of the river.

- as a rule the micro stations will be equiped with two groups with speed governors and tension control equipment.

- maximal standardization of the constructions and equipment will be achieved and local materials of construction will be used as much as possible. (annexed - standardized arrangement of the micro hydro plants).

- the Romanian Industry was organised to delivery the standardized groups to cover the field of head (2 to 120 m) of the first stage of arrangement with only three types of turbines, in all eleven sizes of turbines (annexed diagram). These types of turbines are already produced for the first micro hydro plants, which are under construction.

- the micro hydro plants are done to be automatized, without personnel d'exploitation

At the same time, the constructors and the contractors of equipment from Romania are preocupied to solve in a more efficient manner the problems arise, such as :

- simpl and cheap solutions for dam intakes and adductions ;

- use of the prefabricated parts
- study of the proper equipment to connect the micro hydro plants which will work in an insulated system
- simple means for speed and tension adjustment
- protection against the overspeeding of the groups
- simple closing and opening system of the turbine

Conclusions

The Romanian Hydro Arrangement Programme pays a special attention for the development of the small hydro plants which will contribute to the increasing of the energetical production.

By placing the micro plants all over the country, they have the advantage to supply better the local consumers by direct connection (0,4 kV); at the same time, they make more stable the electrical system (20 kV connection). It is also considered that the development of the micro hydro plants contributes to the arrangement programme of the water resources for irrigation, water supply of the localities, etc.