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ХІМІЧНІ, ФІЗИЧНІ ТА МАТЕМАТИЧНІ МЕТОДИ ДОСЛІДЖЕННЯ ПРОЦЕСІВ ТА АПАРАТІВ

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THE ROLE OF NETWORK ACCESS NETWORKS INFOCOMMUNICATION

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There are several models of info-communication system. The model shown in the first figure, the proposed International Telecommunication Union (ITU). It allows you to accurately determine the location of network access infocommunication system.

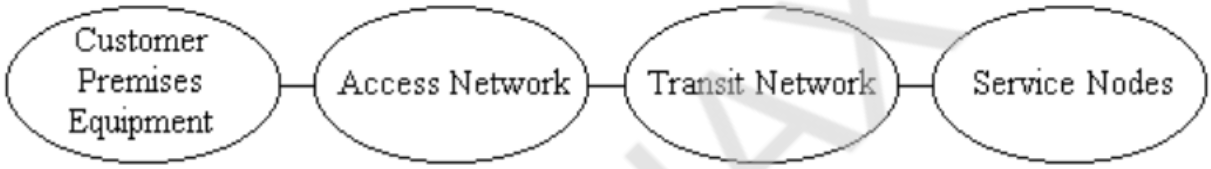

Fig. 1 – Model of info-communication system proposed by the ITU

An example of the equipment at the customer premises can be like an ordinary telephone (housing sector), and a complex set of hardware and software – private branch exchange (PBX), Ethernet LAN and other equipment (manufacturing sector). In the first case, the function element "access network" can perform subscriber line, which is a two-wire physical circuit. In the second case of the access network (for existing telecommunication systems) must include:

— Digital path E1 (or several of these paths) for connecting the PBX to the local telephone network;

— Digital link that supports a stack of TCP / IP protocol, for inclusion in a network Internet;

— Leased lines, if they are necessary to enable the equipment that does not use the telephone network or the Internet.

The primary purpose of network access – to ensure reliable and high-quality communication between all types of equipment installed in a room of potential clients of the operator, and the corresponding transit networks. The evolution of the three elements of info-communication system – "The equipment at the customer premises," "transit network" and "Means of support services" – led to the need for qualitative modernization of the access network. This process requires a serious analysis, it is advisable to start that with technological aspects.

One of the most successful examples of the convergence process can be considered near the functionality of wired (wireline) and wireless (Wireless) access technologies in fixed networks. If we consider the general characteristics of 4G and 5G technology systems, it is possible to talk about convergence fixed and mobile access. This topic is very interesting and important, goes the scope of this article.

In conclusion, it can be said, that the modernization of access networks should be configured to ensure the development of info-communication system in the era of NGN, and even post-NGN. The main requirements of the process to access the network – bandwidth, high reliability, good quality of data transmission while reducing operator costs.

Scientific Supervisor – PhD Sakharova S.V.

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TO THE QUESTION OF REDETERMINATION OF FRICTION MODEL IN THE ROTATIONAL PAIR

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Modern equipment for food production contains a lot of different mechanisms, kinematic pairs of which are pairs with friction. The article examines accordingly the rotational pair with radial loads according to the traditional scheme. For this pair in the case, when it's surfaces are not fastened, there is a well-known mathematical model, which connects proportionally the rotational moment with the load Q. At the same time the coefficient of proportionality is calculated taking into consideration that the area of contact of friction covers a semicircle of the cylindrical body of the pair with radius R. However, taking into consideration that bodies of the rotational pair are made with appropriate tolerances, the real area of a contact is less than a specified one. Namely, it represents a zone, which forms as the result of the appropriate prognoplastic deformations, and therefore its size depends on the total load and neither is permanent. Taking this into consideration, the article solves the problem of working out of refined models of friction in the rotational pair with redetermination of size of the friction zone.

For this was supposed the condition, that the cylindrical body of the pair that is considered, has no vertical displacement, and the load Q must be balanced with reaction forces in the contact zone. If we accept that in this area elastic-plastic deformations takes place, it can be also supposed that the pressure between the elements of rotational pair is approximately equal to hardness by Brinell HB. This allows to obtain the following expression for calculating of the angular size of the contact zone $\arcsin\left(Q\cdot(HB\cdot R\cdot\ell)^{-1}\right)$, according to which the moment of friction forces for the problem, which is considered, can be calculated as

$$M = k\cdot Q\cdot R\cdot\arcsin\left(Q\cdot(HB\cdot R\cdot\ell)^{-1}\right),$$

which gives for the mentioned coefficient of friction k' such calculation expression

$$k' = k\cdot\arcsin\left(Q\cdot(HB\cdot R\cdot\ell)^{-1}\right),$$

where k — the coefficient of friction between the elements of rotational pair;

ℓ — the axial length of the contact surface.

Thus, the mentioned expressions take into consideration the influence of load on the size of zone of friction in the rotational pair with radial loads.

Scientific supervisor – DSc, Associate Professor E.V. Branspiz

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