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ENGINEERING SYSTEMS: ITS QUALITY VS COMFORT AND SAFETY OF LIVING

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Анотація

В статті йдеться про важливість комплексного підходу під час проектування та організації інженерних систем, залежності комфорту та безпеки проживання від їхньої якості.

Ключові слова: інженерні системи, комфортні умови проживання, безпека, якість.

Abstract

The article deals with the importance of complex approach in design and implementation of engineering systems; effect of its quality to safety and comfort living.

Key words: engineering systems, comfort living, safety, quality.

There is no doubt that well-designed engineering systems in a private house, office or apartment in a public-commercial building are the safety of both the people and property inside it and the real estate itself. The balanced work of water supply and electricians, air conditioning and heating, ventilation and security systems leads to unconditional savings in energy resources and overall operating costs [1]. Modern technologies for managing utility networks in a country cottage or in an urban apartment are comfort and a healthy atmosphere with minimal costs for utility bills. However, all this is possible only on condition of competent design and calculation of the power of the used equipment. Otherwise, a serious investment may simply not pay off until the end of the life of a private house.

Talking about modern housing we mean by engineering systems the following elements:

- water supply and sewerage;
- gas supply and electrification;
- heating, air conditioning and ventilation;
- communications, video surveillance and security systems;
- automation equipment for entrance gates and entrance doors.

The coordinated work of elements of internal engineering networks and home equipment allows to ensure the safety of both the equipment itself and the rest of the property in a private house, as well as the comfort of all people living in the house, regardless of their preferences regarding a comfortable microclimate.

A simple example of housing safety is water or gas leakage sensors. A broken faucet, a faulty washing machine, a broken dishwasher or a leaking boiler – all this can lead to irreparable damage to the flooring, shorting of the electrical wiring with the subsequent fire, and in an apartment building – also to flooding the neighbors from below. There is no need to speak about the danger of a gas leak. Special sensors, upon receipt of the corresponding signal, send a command to the servo drive of the main valve, which instantly shuts off. If we talk about comfort, coordination in the work of engineering systems and their competent design is a reduction in utility bills and improving the quality of life in the house. It is quite possible that the room is warmer, but the heating fee is reduced, the air in the house is cleaner and more pleasant, and the electric bills are less. With proper planning of engineering systems and coordination in the work of heating, ventilation and

air conditioning it is a real scenario. Multimedia devices connected via a wired network or Wi-Fi also become a common part of the engineering systems of a private house or city apartment. Video surveillance, alarm and access control devices – all this has also become a common part of modern engineering systems in private homes and apartments of ordinary people due to the affordable cost of equipment of good enough quality [4].

The development of digital technology has made modern engineering systems for the home affordable for almost any family. The relatively small costs of designing, purchasing equipment and its installation will fully pay off during the first 3-5 years of operation. Modern engineering climate control systems in a residential building automatically analyze not only the temperature in the room, but also on the street. Instantly reacting to changes in weather conditions, the "smart home" system adjusts the heat supply to the radiators with the help of temperature regulators and servos. Moreover, such an adjustment is carried out in each room separately. In a private cottage with individual heating, the operation of the heating boiler is also regulated, which significantly reduces energy costs.

The supply and exhaust ventilation connected to the "smart home" system is also regulated depending on weather conditions and the internal microclimate. At the same time, it is important not only to automatically coordinate ventilation, but also to correctly design the system and select ventilation equipment. The presence of a heat recuperator will allow you to enjoy fresh air with minimal heat loss in winter and life-giving coolness in hot summers. The performance of the ventilation system is also important. With insufficient air exchange, all equipment will become useless. With excessively high ventilation performance, the costs of heating in winter and air conditioning in summer will increase. Internet technologies, combined with automated sensors, servos, camcorders and all kinds of controllers, have opened up the possibilities for remote control of home engineering systems. To do this, use wireless Wi-Fi or GSM cellular communication. Most mobile operators offer special, economical rates for smart home systems. Using his smartphone or tablet, the owner of such a smart private house can start air conditioning or heating for some time before his arrival, monitor the situation in the room and take measures if an emergency situation is detected.

Televisions, monitors and projectors, acoustic devices in every room, in the kitchen, in the bathroom and in the living room, multimedia content receivers and storage devices – all this is also part of modern home engineering systems. Being connected to a single wireless or cable network, audio and video equipment is coordinated from a single center, which can be either in the form of a physical module mounted on the wall or in the form of a virtual remote in a smartphone or tablet.

Healthy microclimate in a house providing beneficial effects on health and well-being of residents is completely depends on the quality of job done by engineers.

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