

Studied experimental sites are contrasting the level of radioactive contamination, but on the background of physical and chemical properties and contamination with heavy metals. The largest contribution to the absorbed dose of generative organs of plants making  $^{137}\text{Cs}$ . Dose rates in experimental plots ranged from 7 to 140 cGy / year, compared to 0.14 mGy / year in the control plot.

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## **MODELING OF TEMPERATURE CHANGE DYNAMICS IN ENERGY EFFICIENCY BUILDING**

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Environmental ("green") construction makes a significant contribution to the realization of sustainable development. It provides: 1) energy and resource saving, the use of waste, minimization of emissions of greenhouse gases and toxic substances; 2) harmony with the local climate, traditions, culture and environment; 3) the ability to maintain and improve the quality of life preserving the ecosystem on local and global levels.

In Belarus International Charitable Public Association «EcoBuilder» began to develop the direction of environmentally friendly individual building. According to technology of this organization individual houses were built in the village Stahovtsy, Myadel district, Minsk region and in the village Old Lepel, Lepel district, Vitebsk region. Currently, Private Production Unitary Enterprise «EcoBuilder» is active promoting this direction at Belorussian market. Wide use of local thermal insulation materials (reed, a mixture of clay-straw, clay-chips, ecowool and etc) is one of features of technologies used by the company.

Application of new insulating materials requires research of their efficiency, especially if these materials are used in multilayer structures. Perspective direction of solving this problem is a computer simulation. Often it is impossible to apply modern commercial software systems according to specifications for these purposes without their adaptation and refinement. Therefore, the aim of this work is developing of models which describe thermal characteristics of analyzed home with possibility of these models practical usage in software COMSOL Multiphysics and conducting research of efficiency of local thermal insulation envelope materials.

Preliminary numerical studies of developed thermal models showed that for calculation of whole house special high-performance computing equipments are required. Therefore, in present work temperature change calculation was carried out by supercomputer "SKIF" of UIIP NAS Belarus.

The dynamics of the natural cooling of buildings in winter during a day is investigated. Numerical analysis was done for framework type homes where following options of thermal insulation envelopes are: 1) reed (400mm); 2) reed and clay-straw (100 mm+300 mm); 3) reed (50 mm) + ecowool (200 mm) + flax fibers (50 mm). For comparison, a similar analysis was carried out for house with brick masonry 400 mm.

Results of experimental studies show that all used in construction local materials provide effective thermal insulation of houses. During the day temperature is reduced by 5–7 °C (in a brick house temperature is reduced by 14 °C). Thermal insulation system based on ecowool is characterized higher thermal insulation properties.

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### **ANALYSIS OF ENVIRONMENTAL ASPECTS AND DETERMINATION OF THEIR IMPORTANCE IN THE BRANCH OF MTAC-3, RUE "MINSKENERGO"**

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Minsk TPP-3 is part of a single production-technological complex for the production, transmission and distribution of thermal and electric energy. For the production of energy and heat on mtec –3 the following unit: the power unit CCGT-230 includes a combined-cycle plant with two circuits of the steam pressure intended for the production of electricity and heat.

The composition of the thermal scheme of CCGT-230 includes the following equipment:

- one gas turbine of type GT13E2, produced by ALSTOM with a generator of type 50WY21Z-095;

- one horizontal two-loop drum boiler type HRSG/DP 01.1/production company SES ENERGY Slovakia;

- one steam turbine of the T-53/67-8.0 CJSC "Ural turbine plant" generator type TF-80-2Y3;

- auxiliary equipment;

- automated control system of technological process.

PSU -230 (steam and hot water boilers and combined cycle plant) are sources of emissions of harmful substances that are emitted through the stationary emission sources (chimneys).

At TPP-3 is made for two recycling systems of WO-1 and WO-2 to cool the main and auxiliary equipment.

The aim of this work is the identification of environmental aspects and determining their significance. The significance of environmental aspects was determined by the method in accordance with the "Regulation on the identification and