средств формирования наиболее благоприятной конфигурации электрического поля в объёме макронеоднородного изделия.

Поскольку электрическое сопротивление компонентов изделия постоянно меняется, то возникает необходимость в изменении во времени конфигурации электрического поля, т.е. его своеобразной подстройке.

Development of direct electric curing method for reinforced concrete products to improve their quality and reduce energy intensity

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Thermal curing has been considered as the most energy-consuming stage in reinforced concrete production. Steam curing is one of its most widespread types. The distinctive features of this technique are low energy efficiency due to insufficient leak tightness of the facilities and significant energy consumption for heating of objects and space surrounding the product.

One of the future-oriented ways to implement the energy efficiency potential in this technology is application of direct electric curing of reinforced concrete products. The essence of the method consists of passing an alternating electric current through the concrete. The direct heating of the product takes place apart from the surrounding space and objects thus mitigating the energy losses. However, this technique is difficult to apply for heating of structures with reinforcement cage. Meanwhile, they present most of the reinforced concrete products. Presence of steel reinforcement and embedded items necessarily results in violation of the uniformity of the electric field in the product bulk and overheating of concrete in the areas of its contact with metal, and therefore it leads to occurrence of substantial temperature drops. Currently, most of the experimental research of direct electric curing was conducted on the samples with simple cage shape or on the samples without metal elements. Such experiments do not reproduce the real processes occurring in reinforced concrete products. For this reason

their results hard to use for designing and selection of rational operation modes of direct electric curing systems.

Authors solve the objective of improving the direct electric curing technique applicable to problematic products by means of elaboration of the ways to obtain the more favorable configuration of electric field in the bulk of macro-inhomogeneous product.

Due to the fact that electrical resistance of the product components changes constantly, the configuration of electric field also needs to be adjusted with time.

An efficiency of reprocessing industries by Process Integration and Retrofit Planning

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The problem of energy efficiency in process industries is still hot topic since the first energy crisis in the second part of XX century. Nowadays, this issue is becoming more complex accounting for global warming and different kinds of wastes. One of the most applicable approaches for retrofit of the industrial system is a Process Integration, namely a Pinch approach. This method is unified and more or less simple for application in chemical, petrochemistry, oil and gas reprocessing etc.

The use of a process system analysis allows finding the economically optimal parameters of heat exchanger network but usually, the solution is founded for a steady-state mode. This fact makes retrofit project different from optimum obtained during analysis. At the same time investment efficiency is decreased because of energy prices are changed. Last time this issue became more important due to hydrocarbon market changing, an influence of renewables and other factors.

This paper represents the methodology of optimum Process Integration solution accounting dynamic mode, energy price changes and decision-making time. The optimum solution can be found for time slice when the