

### **1.5.23. FEATURES OF DEVELOPMENT AND APPLICATION OF TECHNOLOGIES OF THE THERMAL NON-DESTRUCTIVE TESTING IN REPUBLIC KAZAKHSTAN**

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Now both for economy of Republic Kazakhstan and for the countries CIS are characteristic presence of set of objects practically in all fields of activity with significant deterioration of the basic means, deterioration of a technical condition and reliability characteristics of buildings and constructions and, as consequence, are presence of power wastefulness and a high probability technological risks.

In modern conditions for the decision of an actual problem of diagnostics emergency and preemergency situations, reliable and effective operation of industrial objects, building constructions and objects of housing and communal services (housing and communal services) are widely used technologies of non-destructive testing.

The analysis of a modern condition of works and practice of monitoring of an operational condition and heat power characteristics of various objects shows, that today it is represented expedient to carry out the control and diagnostics of such objects under the analysis of their temperature fields by a method of thermal non-destructive testing (TNDT). This method has proved to be, as one of the most perspective, technological, informative and objective methods of non-destructive testing, proved the efficiency and having certain scientific reserve.

The estimation of practical results and opportunities of application of technologies thermo vision diagnostics for different classes of objects and our long-term cooperation with the Russian scientists and experts in this area will allow making use today the received of experience and results for set of the Kazakhstan objects in various fields of activity. Today development and expansion of practice of application of the above mentioned technologies on various objects of Republic solve actual claimed problems of power saving and increases of reliability of functioning of industrial and social objects.

Claimed direction of application of methods of the thermal non-destructive testing is building objects and objects of housing and communal services. On these objects according to the Russian scientists, the potential power saving across the Russian Federation makes from 20% up to 40%. Taking into account similarity of building both industrial infrastructures and a uniform initial economic basis of Russia and Kazakhstan it is possible to use with the big reliability these estimations for Kazakhstan too.

Implementation and development of technologies of the thermal non-destructive testing control and thermo vision diagnostic complexes for monitoring the Kazakhstan building objects and objects of housing and communal services will enable to receive an operative estimation of their actual operational condition and their real heat power characteristics that will allow to lower a level of their breakdown susceptibility, above permitted standard thermal losses, to increase power efficiency, reliability and safety of functioning of the above mentioned objects.

Technologies thermal non-destructive testing for industrial targets in strategic branches of economy of Kazakhstan are claimed today. Diagnostics of objects for the enterprises of mining – metallurgical branch and oil-and-gas sector of which presence of "dangerous" objects which operational condition substantially influences occurrence of preemergency, emergency and extreme situations is actual. Such objects are: the oven

equipment (Vanjukov furnaces, furnaces of a boiling layer, roasting machines, drying drums, etc.), oil and gas mains, flues, boilers, power equipments, etc. Practice of work with such technological complexes shows, that deterioration of their operational properties, in most cases, is connected to infringement of their temperature modes, destruction isolation and thermo isolation coverings, infringement of tightness, occurrence of outflow, destruction of lining and etc.

Are actual now in Kazakhstan the works on application of methods of the thermal non-destructive testing for monitoring of ecological objects and objects of the Ministry of Emergency Situations. Under this category get also potentially dangerous objects in various industries and subjects of works on monitoring safety of operation of railways (an estimation of increase of humidity of a railway embankment), monitoring and the control of increasing of deformation of the road basis owing to landslide processes, to detection of washouts and infringements of the road basis in places of passage of engineering communications (drainages, channels, water mains, etc.).

Carried out today "Systemotekhnika" Ltd firm the project on development and expansion of sphere of application of technologies thermo vision diagnostics on various objects in Kazakhstan is focused on interaction with our colleagues in the Russian Federation and development hardware-software components, methodological and normative-legal rules in the given direction.