

sphere), the other provides the self-preservation of the culture of each in contact.

For example, out of bounds of the «northern territories» question is promising for the development of communication «buffer-synergetic zone» between Russia and Japan. It leads to the expansion of contacts between representatives of these cultures in the field of education, art, science, and technology. Thus, to generate new ideas and cultural artifacts, this particular space for communication is needed. It is formed at the boundaries of cultures and riddled with mutual interest and empathy, or rejection and antipathy.

#### **ВНЕДРЕНИЕ ФАЗОХРОНОМЕТРИЧЕСКОГО МЕТОДА НА МАШИНОСТРОИТЕЛЬНОМ ПРЕДПРИЯТИИ**

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One of the problems at the enterprise is the assessment of the current technical state of the processing equipment which inevitably affects the quality of its products. While constantly rising demands for the processing accuracy, increase in productivity and reliability are made, the applied measuring and control-diagnostic equipment, devices and means of metrological assurance do not always allow of obtaining reliable and timely data on a technical condition of objects in full.

This problem can be solved on the basis of the phase-chronometrical method of information and metrological maintenance of cyclic machines and the mechanisms, developed on the achievements of national chronometry and permitting a much higher level of accuracy. Direct measurements of time intervals corresponding to the passing by elements of characteristic intervals of running cycle phases of functioning machines and mechanisms are used at phase-chronometrical approach. The feature of the offered approach is the integrated complex of software and experimental methods and means of object work research on the basis of the precision chronometric analysis of the running cycle phase at all stages of life cycle.

Introduction of this diagnostic method at the enterprise will enable to solve a number of tasks: obtaining high-precision measuring diagnostic information; information and metrological maintenance of the equipment; assessment of the current technical state equipment and its elements and tool; registration of specific behavior features of products of various sizes; ensuring unity of saved-up measuring information at all stages of life cycle; forecast of trouble-free operation and reliable emergency protection; transition to repairs system according to the current technical state; assessment of a residual resource; registration of the fast-proceeding processes inaccessible to the regular equipment.

In view of the aforesaid the purpose of my master's thesis is introduction of the phase-chronometrical method at Komsomolsk-on-Amur industrial enterprises.

#### **ПРОБЛЕМЫ ЭНЕРГЕТИКИ НА ДАЛЬНЕМ ВОСТОКЕ**

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The problem of centralized power supply to the vast North, Far East, and some other regions of Russia is getting more acute each year. For all these regions, safe and economically effective average-power nuclear co-generation plants could be used. In the European part of

Russia there are dozens of places, where average power plants can be deployed. For a town with the population of 300 thousand, like Komsomolsk-on-Amur it is optimal to use an average-power two-module nuclear co-generation plant with the connected electric load of up to 300MW in condensation mode.

Ship nuclear plants have a number of characteristics that are especially advantageous for use in commercial power industry. Besides, they are effective from the point of view of compliance with the toughened safety requirements and have stability against extreme conditions and modern threat such as terrorism. Ship plants are fundamentally better protected against external effects, including extreme blast-shock loads, which was demonstrated by the fact that during the accident with «Kursk» nuclear submarine, its nuclear power plant remained completely intact.

Availability of a proven technology, of production facilities and naval infrastructure, and existing experience in design and operation of similar plants permit to solve other essential issues of nuclear power: considerable shortening of nuclear power unit construction and commissioning term, improvement of NPP performance induces, and decrease of personnel strength. This is the basis of nuclear power competitiveness.

During the last years, the general idea to use conversion potential of defense industry enterprises in nuclear power is realized in actual research and design development.

#### **ОСОБЕННОСТИ ТУРИЗМА В ВОСТОЧНЫХ СТРАНАХ**

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Tourism becomes very popular today. People work all year to have a one-two week rest abroad. As a rule people like to travel, so do I. When I'll finish the university, I want to travel around the world, but still I don't know with whom. They say: want to go far – go together, want to go fast – go alone. That's why I'll need a fellow. When I was at school I had a dream to leave Russia and continue to get my education in Canada. That's why I would like to visit this perfect country to see powerful mountains and impassable coniferous forests, to swim in the ocean and to visit the famous ski lodge resort in Vancouver. Besides I would like to go to Australia, to dip in the diversity world of the local flora and fauna. My dream is to leave for two-day safari tour. Of course it must be dangerous, but really interesting. Nevertheless, I want to visit all continents. So, when I was in Egypt, political and economic situation haven't had imminent nature yet. But, to say the truth I don't want to go there today.

Last time I was in the capital of South Korea- Seoul. This is a perfect city, the city of the high tech and radiant future to my mind. The historic center of the city was built during the Chosong dynasty and now it is located in the heart of the business district. International companies, ancient places, modern offices and hotels are located here. In the center of the capital you can see the symbolic Namsan Mountain, which is used as a place for recreation. At the top there are fountains, gardens, Seoul Tower and a library. In any case, this mountain is as historic place as a resort. Yoido coast is the most developed part of the Han River Park which stretches along the both banks of the river, passing through the entire Seoul. Not far from the coast of the river buses ply as well as floating restaurants and water taxi. This part of the park is a particular loving place of the residents and visitors. In addition there are several large parks: Everland, Seoul Land, Lotte world.

These amazing parks are designed for everyone who wants to have fun. Yaksam is the tallest of the buildings around the Han River. So, in conclusion I want to say, that Seoul is a symbol of Korea's beautiful and modern city, gaining weight in the world as a tourist and financial center.

#### НЕОБХОДИМОСТЬ АВТОМАТИЗАЦИИ ПРОЕКТИРОВАНИЯ СОСТАВА ТЯЖЕЛЫХ БЕТОНОВ

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Proportioning of various kinds of concrete and accordance of their properties to norms of Russian Federal Standard is one of the important technological tasks. Realization of these tasks is connected with some problems. Concrete mix influences on its durability on the level of operating reliability bearing strength as well as on the level of use of resources which are required for manufacture of construction and prefabricated elements. Generally, proportioning of various kinds of concrete is connected with decision of some important tasks:

1. Choice of water-cement ratio influencing on durability of concrete structure (part) and corresponding to work conditions of construction. Durability is usually considered as concrete compressive strength that influences on many other properties of concrete.

2. Production of necessary concrete consistence influencing on mobility and placeability of concrete and required concrete quality. The right combination of concrete components is selected to reach this purpose.

3. The lowest costs of means on production of concrete and its laying.

Now there are rather a large number of the methods actual development of which is the following: 1) more complete accounting of factors and design requirements for concrete; 2) increase in efficiency of calculation algorithm. In solving problems concerning heavy concrete it is necessary to define values of the water-cement ratio and water consumption taking into account demanded mobility or rigidity of concrete mix, and consumption of aggregates. Taking into account the development of computer technologies there is a need of automation of the solution of the tasks of this type that is the selection of heavy concrete composition based on their functions and working conditions.

We can conclude that it is necessary to improve the algorithms of calculation of concrete composition and their automation to increase productivity and to facilitate the solution of this problem at the enterprises.

#### МЕТОДЫ РАСЧЕТА ЖЕЛЕЗОБЕТОННЫХ КОНСТРУКЦИЙ

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It's almost impossible to imagine building construction without concrete.

Steel and concrete have been used together in construction since at least the middle of the 19th century. Concrete and reinforcement can work together because there is a sufficiently strong bond between the two materials.

It is known that concrete has high compressive strength, but it has low resistance to tension but steel copes with it very well. Concrete reinforcement is utilized not only to prevent the concrete from cracking but to take up

the tensile force. When the concentrated load influences on the concrete, it reaches the limit of its strength; in the reinforced concrete beam reinforcing bars take up tension after the concrete has cracked. Only when the concrete reinforcement approaches ultimate strength, the deflection and the crack become large enough to make the beam to break down. The failure of the beam is characterized by the crushing of the concrete in the compression zone.

There are three methods of calculation of reinforced concrete structures: allowable stress method of design (it's not possible to determine the actual stresses and failure load), failure load method of design (it does not allow to evaluate the performance of the structure before the failure, for example at working load), limit stage method of design (it is widely used today). The main idea of the limit stage method is that even in those rare cases when the construction is exposed to maximum load, the strength of concrete and reinforcement is minimal, and under the most unfavorable operating conditions the construction would not be destroyed, and would not accept invalid deflections or cracks. In many cases it is possible to obtain more economical solutions than in the calculation of the previously used methods.

But reaching the limit stage the reinforced concrete structure does not crash immediately, there is some time during which it continues to resist. Nowadays there are no methods that would take this into account.

#### АЛЬТЕРНАТИВНЫЕ ИСТОЧНИКИ ЭНЕРГИИ В АВИАЦИИ

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There are two reasons for searching alternative sources of energy in aviation. First is the cost of flight – the global aviation industry spends approximately \$200 billion on aviation fuel based on current prices. Second is the environmental pollution. AirportWatch, an umbrella organisation for those concerned about the environmental effects of the aviation industry, reports that the 16,000 aircraft operating on a daily basis emit over 750 million tonnes of CO<sub>2</sub> annually.

Many people believe that electric aviation can replace our oil-based transport with a system that is faster, cleaner and cheaper using existing technology. Electricity may come from fuel cells, solar cells, ultracapacitors, power beaming, or batteries.

Though only small companies and entrepreneurs are currently making fully electric airplanes, larger manufacturers such as Boeing Co. and Airbus are investigating how to electrify portions of aircraft operations as the push for bigger, faster and farther yields to cheaper, quieter and greener. One example is the auxiliary power unit in commercial aircraft. The device, usually located in the tail, is a generator that provides electricity to the plane when it's on the ground and gives power to start the main engines. Boeing and Airbus are experimenting also with electric landing gear that allow aircraft to turn, taxi and reverse on their own power without a truck to push the plane back from the gate. These systems can also integrate regenerative braking so that the energy from slowing a landing aircraft could charge batteries.

Electric aircraft could be useful as trainers for pilots because the aircraft are cheap to operate and trainers seldom venture far enough to test range limits. Defense contractors are also pursuing electric drivetrains to make stealthier unmanned aerial vehicles that have a minimal heat signature. They could also be charged on the fly from photovoltaic panels.