is the presence of fluid (diesel gas oil) which removes small pieces from the well. This technique was tested in Altai where the reservoir rock was micro quartzit (one of the most solid rocks). This method showed the increase of well drilling speed from 3.3 by using traditional method to 5-6 m/h by applying electro pulse technique of well-drilling. The findings of this research showed that the proposed method is economically viable and can be used practically in oil industry.

REFERENCES:

1. Ushakov V.Ya. Pulsed electric breakdown of liquids. - Tomsk: publishing house. TPI, 1975.- 256p.
2. Barskaya A. V. The investigation of the dispersion of herb and extractions from water-soluble media using impulse discharge: PhD dissertation. Tomsk, 1998.-196p.
3. Naugolnykh K.A., Roi N.A. The electrical discharge in water. Moscow: Science, 1971. P. 155.
   http://www.electropedia.org/

MPI AND PVM SYSTEMS

[1]V.A. Kirienko, [2]G.A. Nizkodubov
[1,2]National Research Tomsk Polytechnic University
Institute of Power Engineering, [1]group 5Б53

In modern world it is already impossible to do science without a computer. It accompanies all scientific research, experiments, helps in the data analysis, modeling and description of the processes. However, some areas of science require very accurate calculations or complex programs for making new discoveries. The capacity of a typical computer will be not enough for that. That is why supercomputers are becoming more and more popular now. With its high performance and MPI and PVM systems help it’s possible to speed up data processing and get accurate results. Let’s try to understand the essence of these systems.

MPI (Message Passing Interface) – special messaging library, a collection of functions on C / C ++ or Fortran languages, which give a chance to facilitate communication and synchronization problems between the processes of a parallel program with shared memory. Currently, the library has become the established standard for parallel programming, it has implementation for modern and popular computer platforms and programming languages (Fortran, C / C ++, Java), applies not only to write programs for supercomputers, but also for clustered systems. Library versions are constantly updated, it allows you to perform new operations, solve different range of tasks. In accordance with this system it is allocated to the memory node master and slave core. The main problem comes on the leading core, where it is recognized and redirected to the slave core, where there is an immediate solution to the problem and then results are returned to the master mandrel core.

PVM (Parallel Virtual Machine) - a software package, that brings together a diverse set of computers in a single computing resource, called a virtual parallel machine. This integration enables you to control the processes by message passing mechanism. PVM can be used on multi-processor computers and on the computer systems built on cluster technology. Directly PVM system is composed of two parts. The first part is a demon, which is installed on all computers and makes it possible to get to the virtual machine. Multiple users can simultaneously configure overlapping virtual machines, and each user can execute several PVM applications simultaneously. The second part of the system is a library of PVM interface routines. It contains a complete list of functional primitives that are necessary for the interaction between tasks applications.

Both systems have been changed many times and subjected to rigorous testing and comparisons on the subject of performance. Tests have shown that the superiority of MPI system, which is actively developing in our days. It can solve more tasks that PVM system at the same time. Nowadays PVM system does now have new updates, but old versions can be successfully used for obtaining higher performance. Systems MPI and PVM become a breakthrough in the field of computer technology, allowing to obtain high-quality results in a short time.

EXTRACTION OF THE MINERALS ON THE MOON FOR PROVISION MANKIND WITH ENERGY FOR 10 000 YEARS

O.I. Zhdanova
National Research Tomsk Polytechnic University
Institute of Power Engineering, department of Electric Power Systems, group 5A54

It's no secret that humanity is on the brink of energy crisis. How much more Mother Earth will provide us with fuel? 50 years? 70? Well 100 maximum. Advanced and forward-thinking companies benefit from wind power, solar and flows of rivers.

Due to the high rates of consumption of minerals and the high human population growth, mineral resources on planet Earth are in the process of exhaustion, this shortage creates the need to find new alternatives to supply the growing needs. An additional alternative to the traditional search for new deposits on Earth, is the search for deposits beyond our planet, these new resources can be found in the vicinity of our planet. The mining of bodies of our solar system like the Moon, Mars and the asteroid belt can provide abundant energy resources such as helium 3 and minerals such as potassium, rare earth elements, iron and platinum group minerals.

The Moon provides the greatest potential for mining in our solar system; due to its proximity to our planet. Mining the moon to meet our energy needs may sound like the plot from a sci-fi movie, but China is considering doing exactly that. Helium 3 is an extremely valuable isotope that could be used in clean fusion plants to generate energy – and it’s available in vast quantities on the moon.

Some scientists say that the moon is so rich in Helium 3 that it could solve the world’s energy problems for at least 10,000 years. Fabrizio Bozzato, a doctoral can-