Energy Safety: Problems and Solutions

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Energy safety is a complex, multidimensional concept that has several layers: political, economic, and technogenic. Achieving energy safety requires certain government policy and the implementation of special measures. Markets can also contribute to energy safety, but they cannot be the only ones to contribute. Achieving energy safety requires co-utilization of all control mechanisms [1].

It should be added that energy safety is a guarantee of delivery and transportation reliability, control over pipelines, renouncing energy blackmail, avoiding speculative price increase, and so on.

Political energy safety is associated with energy independence of a state, its entity or region. Energy safety is, first of all, a political problem. Sustainable development and stability of state-manufacturers in the energy field is of great importance to economic energy safety. Such stability can be jeopardized due to yet more difficult conditions for energy resources exploration and production that is possible only by using state-of-the-art technologies and involves environmental disruption and transportation difficulties.

Energy safety depends upon industrial policy conducted by energy-supplying countries. “Today, there is a conflict between sales strategies such as free trade stimulation, opening and liberalization of energy markets, and energy safety strategy” [1].

The **economic side** of energy safety depends to some extent upon competition for energy resources. However, the importing countries’ attempts to solve the energy safety problem on their own are also doomed. One of the main characteristics of the global energy safety problem lies in the fact that states’ unilateral actions do not lead to positive results and the problem requires joint

efforts of all the parties interested in finding a solution. At the same time, energy safety means providing uninterruptible access to energy resources at a fair price.

In the meantime, under present conditions of lack of integration in the world, the reclamation of renewable sources by a number of countries is crucial. In addition to that, the future of energy safety largely depends upon the energy-saving state of energy resources: those already available as well as new types of renewable energy sources. This approach, in the author's opinion, is the most effective [2-4]. In "energy of the future", the following priority directions will prevail: energy saving; utilization of environmentally-friendly fuel extraction, transportation and combustion technologies; use of renewable energy sources as a basis for human development and preservation of significant volumes of natural resources for future generations .

Political and economic components are extremely important, but technogenic safety is still the most important in the author's opinion. **Technogenic** energy safety implies "technogenic kind of risks for humans, property, and environment, associated with the operation of any energy plants, including electrical equipment, heating and nuclear energy plants of energy-supplying organizations as well as consumers of electrical and heating energy"[5]. This type of energy safety includes a comprehensive assessment of technogenic hazards of a power engineering facility: electrical and fire safety, electromagnetic and mechanical safety, environmental and industrial safety, explosion safety, radiological, nuclear and chemical safety, etc.

Each one of these directions can be – and is – a matter of study, research, and implementation. Technogenic danger risk reduction is an entire complex of measures to be constantly carried out. "By expert estimates, over 70% of manmade disasters and accidents are associated with a human factor. Therefore, professional expertise is the main vector for providing technogenic energy safety"[6]. These are, tentatively, the main problems in the field and their remedies.

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