Interview: Amnon Einav

HTR nuclear reactors could provide Mideast with electricity and water

Mr. Einav is chief scientist at the Israeli Ministry of Energy and Infrastructure. The interview was conducted by Jonathan Tennenbaum on May 13.

EIR: First, I would like to have your views on the importance of desalination technology in the context of the present situation in the Middle East and the future of the area.

Einav: Well, water is a relatively scarce commodity in the Middle East and it is felt that in order to overcome this scarcity, one should try to introduce new sources of water into the region, which means either importing water or creating water through desalination. Of course, you know there are many techniques to desalinate water—commercial ones, like the reverse osmosis, or evaporation techniques, like the multi-effect evaporation units that are being produced in this country. I have the feeling that we have no alternative but to use either of those technologies or maybe the multistage flash process, which is also available. So we'll have the advantage of actually using those technologies which are well known and established commercially.

EIR: Our publication has been circulating a policy proposal put forward by Lyndon LaRouche, called the "Oasis Plan," which involves using nuclear energy in combination with desalination units to create a network of centers that would produce energy and desalinated water, have high-technolgy agriculture, and be centers for regional economic development, connected by canals and high-speed rail systems. What do you think of that perspective?

Einav: In the 1960s there were some programs which were pretty similar to this program. There were certain scientists and engineers who went to the United States and worked in some of the laboratories—Oak Ridge [Tennessee], in particular—elaborating those programs and making some feasibility studies based on the then-known techniques of nuclear reactors. I think it is a well-conceived idea, and if we are able to indeed actually materialize this idea, then it might be one of the solutions for this region, especially with the population growth which you see nowadays.

EIR: A particular technology we have discussed is the so-called high-temperature reactor (HTR), particularly the pebble bed form that has been developed in Germany.

Einav: As far as nuclear reactors are concerned, it is probably the best nuclear reactor to be worked on for future use, because compared to other nuclear reactors, it has built-in buffers against the danger of accidents. . . . Of course, if [desalination] could be combined with electricity production, then you can reach a relatively high efficiency of this system with respect to the amount of heat you are producing. So, if you ask me, yes, I think it is a pretty good choice.

EIR: Unfortunately, although prototypes were built in Germany, the further work in this direction has been shut down or reduced greatly.

Einav: This is a sad story, I must tell you. This type of reactor is promising, because it has some inherent safety features that you will not find in other reactors. And you could use thorium as fuel, which is not easily done in other types of reactors. . . . So, it has some important inherent features and that the fact that it was discontinued is, from a technical point of view, a very sad fact.

EIR: In the late 1980s, a major effort was launched in the Soviet Union, in cooperation with Germany in particular, to perfect the high-temperature reactor. Recently there have been reports of negotiations to pursue this development as a joint East-West project.

Einav: If this agreement would materialize, I think it is something we should look for, because it is a good alternative for the supply of electricity and also for this type of dual purpose application.

EIR: What would be the capabilities in technology and know-how in Israel itself to participate in and contribute to the construction of this type of equipment?

Einav: It's really a dynamic question. When we were looking earlier at the installation of another type of reactor, we reviewed the capabilities. Civil works is something that we can do in our country. We can also do some of the heat exchangers, we can do some of the piping and some of the delicate machinery and control systems. Certain pieces we would not be able to do. If you need pressure vessels, our industry is not capable of doing that.

So, I would say that a pretty sizable part could be done here, but not all of it. Some of the critical components would

have to be imported, that's for sure.

EIR: But we're looking into the future to go to a very large-scale use of small modular-type reactors.
Einav: Then I think a feasibility study should be made in order to see what kind of components could advantageously be manufactured in our country. This would be quite easy: We have a pretty developed industry that is quite sophisticated in certain areas, and we would be able to manufacture up to 70% of what you have in this plant after we do some work. I think it is in that ball park—the least would be 40%, and up to 70%. . . .

EIR: We are now talking about the nuclear part, but then there would be the desalination plant, which Israel already produces for itself.
Einav: With the desalination, there would be no problem, because we have a company here that is manufacturing multi-effect distillation desalination plants and also vapor compression desalination plants. Part of the components we will buy outside, such as certain special pumps, etc., as necessary. But most of it we can produce in this country with no difficulty.

EIR: Such a development could involve a division of labor among nations. We are talking about a region that involves Israel and Arab states, and one of the points of the Oasis Plan was that political solutions will not work in the long term, unless they are associated with real economic development which involves water and so forth. How would you see this kind of development of nuclear desalination centers and so forth in the context of regional cooperation? What about the area of Gaza: What would be the possibilities for cooperation there?
Einav: Well, if there is a will there is a way. There could be cooperation. A plant like this could be run with common teams that were trained together. If it is a common plant, peoples of both nationalities could operate it, and it will be subject to certain controls by the International Atomic Energy Agency. One could find solutions for this type of plant and operate it quite easily.

EIR: There is a particularly acute water problem in Gaza. In an earlier discussion you mentioned a possible location in the south there.
Einav: It would be in the very south or at the edge of the Gaza Strip, and then people from Egypt could participate, and people from Gaza and people from Israel could participate in running this plant and maintaining it under international control.

EIR: One feature of the HTR is a very high degree of security against proliferation.
Einav: As I mentioned, the fact that it could be fueled with thorium is a definite advantage, and this is also one of the disadvantages of discontinuing the development of this kind of reactor.

EIR: How would cooperation involve other nations, such as Russia, for example?
Einav: Russia is a big power, although right now the situation is bad. It's like having a sick giant, but it is still a giant. If you take the capabilities they had and divert them to the correct goals, then everyone could benefit. So, by all means, if there is any possibility to engage the Russian scientists and Russian technologies, Russian engineers and production facilities, in order to provide for certain types of nuclear facilities or other facilities at a reasonable cost under rigorous controls and standards, then everyone could benefit. It is only a matter of providing a goal, and providing the money and the vehicle and the appropriate people in order to bridge the gap between the western mentality and the Russian way of doing things, which is different. Although some of the products may look similar, there is a different way of looking at the product and a difference in methods of analyzing a given area. So, there should be an effort to bridge the gap between the Russian technologies and the western technologies and the user. . . .

We can take advantage of all the many people that came

Correction

The "Science Policy" article entitled "Thorium Holds Great Promise for India's Nuclear Future," which appeared in *EIR* of May 6, 1994, should have included the following references:

1) "The Potential Uses of Thorium as a Nuclear Fuel," Dr. H.L. Roy Memorial Lecture, by Dr. Raja Ramanna, Nov. 21, 1981.

2) "Nuclear and Material Aspects of the Thorium Fuel Cycle," by P. Rodriguez and C.V. Sundaram, *Journal of Nuclear Materials*.

3) *The Thorium Fuel Cycle*, by E.R. Merz, Institute for Chemical Technology Kernforschungsanlage, Jülich, Germany.

4) "The Reoptimized Large HGTR Plant Using a Nonproliferation Fuel Cycle," by A.J. Neylan and G. Jones. *Proceedings of the American Power Conference*, 1978.

5) "Concrete Reactor Vessels for HTRs—Building on German Experience," by J. Schoning, C. Elter, and G. Becker, *Nuclear Engineering International*, October 1984.

6) *Nuclear India*, published by the Department of Atomic Energy, Government of India.

over from Russia, and actually bridge this—what I dare call—mentality gap, to go from Russian-type to western-type of applications, etc. . . .

EIR: We have spoken of the need for large-scale development of infrastructure internationally, where the various national governments would have to play the leading role in financing and overall direction.

Einav: I agree that one should spend more on infrastructure, and I think our government has already detected this issue. If you come to our country, you will see that a lot of money is spent now in rebuilding the road system and we also have some plans to invest in railroads and other big projects. When you have actually built your infrastructure, and you build it in time, you have all the amenities to actually revive your economy at a later date. I know that some governments, and for some time our government, did not spend enough money on revitalizing the existing infrastructure and building infrastructure for the future. When you invest in this way, you gain a lot in the future. You don't see the gains immediately, but you'll see them later on. I think the idea is a healthy one.

EIR: The Oasis Plan features the use of high-speed rail and magnetic levitation systems for goods and passengers as a motor for economic development. It foresees a regional high-speed transport system for your region being integrated into a Eurasian and all-African system running from the Atlantic to the Pacific and from Scandinavia down to the southern tip of Africa.

Einav: I think it is a magnificent idea, because I also feel that there is a limitation to the air traffic: You cannot increase the sizes of the airplanes, and there might not be enough space to have big airfields near all the cities. Going back to high-velocity trains is a very good solution. We may see a second coming of the railroad as the prime mover. And I would also add that with air traffic, you will always have to use—at least in the near future—engines that are using fuel which may cause problems in polluting the atmosphere. Whereas with railroads you would be able to use electricty and be able to create electricity by other means. And you will be able to transport a higher volume of passengers. And for high-speed freight, a train could be completely automatic. You would only need remote sensing devices to track the train. You could send it from one place to another with almost no one attending it, or maybe two people for a huge train.

EIR: Is there thinking going on in Israel on building a regional railroad network and integrating with the rest of the world?

Einav: We would love to do it. It is not under our ministry, but I heard this kind of thinking around our place, and, of course, we would like to be a connecting link between Asia, Europe and Africa. And it would be quite natural. I think it is an idea that people will welcome in our region.

Russia's Economy

Theory and practice of the swamp

by Andrei Orlov

Dr. Orlov is prorector of the Economics Academy of the Russian Federation Ministry of Economics. We are publishing this article on the state of Russia's economy, abridged from a chapter of a forthcoming book, with Dr. Orlov's kind permission. It is dated April 15, 1994.

"My atheistic Russia,
My sacred country!"
—Igor Severyanin, *My Russia,* 1924

To begin with, some dry, but nevertheless impressive figures characterizing our great and much suffering Motherland: Russia today is 17 million square kilometers in area, or one-seventh of the Earth's land mass. The population of the Russian Federation is nearly 149 million people, of whom 110 million are urban and 39 million are rural. Russia comprises 21 republics, 6 territories, 48 regions, 1 autonomous region, and 10 autonomous districts. It has approximately 1,060 cities and 2,160 towns.

Russia's share in the world production of electric power is 9-10%; oil, 16-17%; natural gas, 30%; coal, 8-9%; steel, 10-12%; mineral fertilizers, 10-12%; lumber, 15-17%; cement, 6-8%; woollen cloth, 13-15%; grain, 5-6%; sugar beets, 8-10%; potatoes, 10-12%. Russia possesses one-quarter of all forests, the "lungs" of the world.

At world prices, the fuel and power complex of Russia (which is our leading sector, along with the military-industrial complex, among the state-supported sectors of industry) may yield a profit of $130 billion. This money could subsidize agriculture and the agro-industrial complex as a whole, as well as culture, science, education, and other spheres and branches that serve the people. But until now, our state has been bankrupt in this respect. It takes at least 45-50 trillion rubles [approximately $25-30 billion at April 1994 rates of exchange—ed.] to support 1 million unemployed, 35 million pensioners, the sick, the disabled, and large families in the face of inflation.

Russia is still one of the most multinational countries. Russians make up over four-fifths of the population—120 million people. There are 3.5 million Tatars, 4.4 million