

## **A Proposal to Reduce the Possibility that Soviet Weapon Scientists will Accelerate the Proliferation of Nuclear Weapons**

### **The Problem**

The growing economic problems in the former Soviet Union and Russia could lead to the exodus of large numbers of scientists and engineers who are experts in nuclear weapons development. If these people go to states with emerging nuclear weapons programs, they could accelerate the proliferation of nuclear weapons in third world countries.

Several recent newspaper articles have discussed the problem of Soviet weapons experts possibly being out of work and finding employment in third world countries which are trying to build a nuclear weapons program. This is in many ways similar to the situation following World War II when German scientists were used as the nucleus of ballistic missile programs in the U.S. and Soviet Union. In the case of the German scientists they were "drafted" into participation. In the current case the Soviet scientists and engineers will probably be more free to choose where they go. Financial incentives may turn out to be the deciding factor. For a state with the desire to improve or create a nuclear weapons program, buying the expertise in the form of Soviet experts is an obvious way to accelerate such a program.

### **A Possible Solution**

Develop a program to encourage these Soviet scientists and engineers to stay in Russia using a program of joint research with U.S. scientists on issues of global importance, i.e. energy and environment. Such a program of joint research would have the following objectives:

- 1) **Keep Soviet nuclear weapon scientists in the Russian Republic.**
- 2) **Provide a period of transition for these scientists to move into the new Russian economy or to continue peaceful scientific research under sponsorship of the Russian or other Soviet Republics.**

This approach has several positive aspects. First, from the point of view of the former Soviet Union, the prospect of many of the best scientists and engineers leaving the country will only further hinder the recovery of the economies of the various republics. Thus, a program which could help keep these valuable human

resources available to help with the economic recovery should be appealing to the Russian Republic. Second, a source of reliable funding and substantial interaction with U.S. researchers should provide the incentive needed for the Soviet weapon scientists to remain at their laboratories and pursue these projects of global importance. The principle drawback from the U.S. perspective is that the U.S. would likely have to fund the joint research at the Soviet weapon laboratories.

### Financing

**As the Soviet Union is in economic chaos, U.S. financial support will be needed for these joint research projects. The key elements that will be needed are:**

- 1) An accounting method that ensures that the money is spent for the purpose intended, i.e. to fund former nuclear weapon scientists for research on programs outlined by the U.S. ( energy and environment).**
- 2) A funding profile that diminishes the U.S. participation over time (perhaps 10 years) as a way to encourage these scientists to move into the Russian economy over some period of time.**

The initial level of funding for such a program would need to be worked out with the Russian Republic or the central government. Based on the expenditures at the U.S. weapons labs for nuclear weapons development and assuming that the funding to the Soviet labs is cut in half and that manpower costs are significantly lower than in the U.S., an expenditure of between \$100M and \$300M for the first year might be needed.

### Oversight of the Research Projects

**One approach to oversight is to define joint research projects with the DOE Labs. The research of the Soviet scientists is then part of a larger research project which has defined goals and objectives.**

This provides a way to direct the Soviet work into specific sub-tasks that support research in areas the U.S. chooses. The funding could come through the appropriate DOE funding channels to the DOE lab project earmarked for Soviet participation or directly to the Soviet weapons labs earmarked for participation in an area of research. In effect this would work like a subcontract to the DOE labs for specific research.

## The Research Areas

The joint peaceful research should focus on areas of interest to both the U.S. and the former Soviet Union. Two main areas could be energy and environment. It would be useful if the detailed research projects effectively utilized the technical skills which are available in a weapon's program.

We can use the U.S. weapon labs as a model and emphasize programs which overlap peaceful research at the U.S. labs. Some specific projects for consideration are:

### Energy

- Combustion efficiency for automobile fuel
- Fusion energy research, perhaps through an expanded role in the ITER Program
- Improved batteries for use in electric cars; this could expand on the Aluminum- and Zinc-Air Battery research
- Renewable sources of energy, such as geothermal, wind, solar, etc.
- Insitu coal gasification
- Improved/Safe fission reactors perhaps through expanded role in existing U.S.-U.S.S.R. agreement through NRC
- Uranium enrichment with laser-isotope-separation

### Environment

- Methods for remediation of contaminated sites
- Improved methods for handling and disposing of toxic and radioactive waste
- Atmospheric modeling to provide improved capabilities to track releases of toxic gases
- Develop regional ocean models to predict the spread and drift of oil spills to facilitate clean-up
- Global climate modeling