How to Build 6,000 Nuclear Plants

There is only one way to bring the world's 6 billion people up to a decent living standard: by using nuclear fission to provide the energy needed for industrial economies. Nuclear, and in the future fusion, are the only energy sources with the flux density that can do the job. To take one measure of this: One nuclear fission event releases 250 million electron volts of energy, compared to less than 8 electron volts for the best chemical reaction. (See Robert J. Moon's article on the Manhattan Project, p. 45.)

The task is huge, but the issue is one of life or death. Energy production worldwide must be *doubled* in the next 45 years, to bring the existing population in the Third World up to par, and to keep up with the projected 3 to 4 billion in population growth. There are 1.5 billion people in the world who still have no electricity at all—not only no computers and no televisions, but no light bulbs—and billions of others have just a fraction of the electricity required for a productive economy.

How many nuclear plants will it take?

Nuclear engineer James Muckerheide, director of the Center for Nuclear Technology and Society at Worcester Polytechnic Institute, and the State Nuclear Engineer for Massachusetts, has calculated that we need 6,000 new nuclear plants by the year 2050. This requires an aggressive program, starting now to build the factories that can produce the necessary plant components, and mass produce the production facilities that will mass produce reactor vessels. It also requires accelerating the processing and enrichment of uranium.

The production schedule, as Muckerheide outlines it, has to radiate out—along the Eurasian Land-Bridge route, for example—reproducing production facilities at a rate that will keep up with the new cities along the Land-Bridge.[1]

John Ritch, Director-General of the World Nuclear Association, has put the figure at 5,000 new nuclear plants.[2] Both he and Muckerheide envision a mix of plants, large and small, modular, high temperature, fast reactors (breeders), floating reactors—and some new designs still in the idea stage.

The numbers may sound staggering, especially compared to the pitifully small number of plants the U.S. nuclear community intends to put on line in the next decade (exactly one). But the technical and engineering expertise exists, albeit inactive or in embryo. What is missing is the ability to think outside the shrinking social universe of the last 30 years, where both mental abilities and expectations were forced into suspension among the very population that needs to lead the fight to go nuclear today. What has beaten down the former scientific optimism is the idea pushed by environmentalists and anti-environmentalists alike, that austerity rules, that there is a limited pie, that cost-benefititis must infect everything.

For the saner leaders and policy makers in this limbo, the jolt out of this unhappy state will be their increasingly closer view at the edge of the financial precipice, taking in the colossal dimensions of the collapse about to hit.

A New Bretton Woods

As we are already seeing, both Democrats and Republicans are coming to understand what Lyndon LaRouche has been talking about for 30 years: Without a New Bretton Woods financial architecture, and a massive program for building new infrastructure at home and around the world, the world will sink into a New Dark Age, one of perpetual war, disease, and misery more horrible than previous dark ages. Those who

remember what it was like in the early postwar years, can see that the United States, with its crumbling bridges and sewer systems, collapsed transportation, and bankrupt industries, will soon be a formerly industrialized nation in a Third World condition.

For those not familiar with the LaRouche economic program, we recommend his new book, *The Earth's Next 50 Years* (Leesburg, VA: LaRouche PAC, 2005, $20.00), which lays out in full historical perspective the dramatic shift in thinking that is necessary to survive the looming crisis and move the noösphere—man's creative development of the biosphere—forward. As a start, see his summary article on "The Peaceful Concept of Technology Transfer" on p. 8, and the accompanying translation of a 1943 paper by V.I. Vernadsky.

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Building nuclear plants is a known technology. The French can put a 1,000-megawatt plant on line in 3 years, and the Japanese, using a U.S. design, put a 1,000 megawatt boiling water reactor on line in just a little more time. The new, modular, inherently safe reactors, like South Africa's Pebble Bed High Temperature Reactor or General Atomics' GT-MHR can be mass produced and come on line even more quickly in the future.

That the world wants to go nuclear, was made clear at the March 20-21 meeting of the Organization for Economic Cooperation and Development in Paris, "Nuclear Power for the 21st Century." For the first time since the Atoms for Peace years of the 1950s and early 1960s, top level representatives from 74 countries came together to discuss the nuclear option. The vast majority concluded that nuclear was a necessity.

China's plan to build 30 nuclear plants in the next 20 years, and South Africa's plan to mass produce the high-temperature Pebble Bed Modular Reactor for domestic use and export, are the high points of the discussion. The new demand for nuclear was in many cases shrouded in global warming language—all utterly false; nevertheless, there is recognition that if nations want a safe energy supply, nuclear is the way to go.

Where does the United States stand in all this? Disgracefully, despite some pro-nuclear rhetoric, the U.S. nuclear industry and the Department of Energy and its various beneficiaries are chained to a "cost-benefit" economic model that will get them and the nation nowhere, fast. The case of the Fast Flux Test Facility, now on the chopping block allegedly because the DOE found it not "cost effective" (see p. 68), is exemplary of this folly. Essential infrastructure—whether nuclear energy, or national rail systems—should not be measured with an annual cost-benefit yardstick that ignores both the future—and the past.

Should medical isotope production—necessary for treating cancer patients and saving lives—be stopped because it doesn't "pay for itself" immediately? Should the training of graduate engineering students at a nuclear research reactor be stopped, because the payback isn't instantaneous? And how is the testing of new fuel elements and materials for future nuclear and fusion reactors supposed to reap immediate money?

This nation could not have been built with that kind of cost-benefit yardstick, and Franklin Roosevelt could not have retooled America's industries to win a war with that kind of yardstick.

Right now, the United States no longer has the capability to produce even one nuclear reactor vessel—never mind half a dozen—in a timely fashion. With a little effort, we could gear up to do it, providing skilled jobs for the now-unemployed trained production workers, re-training those without technical skills and the unproductively employed, and providing a future for upcoming generations. Instead of downsizing, to keep pace with pessimism, the United States should mobilize its brain power for exporting nuclear technologies and their spinoffs to the vast numbers of people in Eurasia who are eager to industrialize and to make use of their own raw materials.

There is a generation of skilled Americans, who have been fighting for 30 to 60 years to move the nation forward in space and nuclear, using the science driver approach to economic prosperity. We know many of them—and they are eager to see their plans and dreams, many of which exist in blueprints, and some of which have long been approved by Congress, come alive within their lifetimes. The way the LaRouche Youth Movement remoralized the nuclear community in the Hanford area (see News Brief, p. 6) is an example of this. We need the expertise of these Democrats, Republicans, and Independents now to provide leadership for the biggest infrastructure-building plan the world has ever seen: Not just to build a handful of new nuclear plants for the United States, but to help build the 6,000 nuclear plants the world needs by the year 2050.

We also need to totally restructure the regulatory industry, now dominated by the unscientific phalanx of well-paid environmentalist executive idiots, who prate about "the planet" but can't tell you the difference between the biosphere and the noösphere, and who define a human being by the amount of solid waste he produces annually.

Where Does the Money Come From?

How to pay for the necessary infrastructure is where many otherwise-optimistic people stumble into the pessimistic mindset. But, the solution is not so difficult in conception. Society can't advance without adequate energy; the environment can't be maintained without advanced technologies that require energy. Therefore, as with Roosevelt's infrastructure-building programs, the state needs to create the low-interest long-term credits to get the job done. The payoff will be tremendous—like the space program, which returned $14 to the economy for every $1 spent. Men and women will be able to work in real productive jobs; students will have a future to look forward to; and our generation will know that future generations will not have to worry about adequate energy or the basic necessities of life.

As Admiral Rickover, the builder of the Nuclear Navy, was fond of quoting from *Proverbs,* "Where there is no vision, the people perish."

—Marjorie Mazel Hecht

Notes

1. Unpublished work in progrss.
2. As reported in *New Kerala* March 14, from Ritch's article in the Indian nuclear journal *Nu-Power.*