Assessing the Megatons to Megawatts Program

DONALD KENNEDY'S EDITORIAL "GOOD Prediction, Bad News" (1 Feb., p. 765) gives a mistaken account of the landmark program called "Megatons to Megawatts"—the 20-year U.S.-Russian effort to convert Russian nuclear warheads into fuel for nuclear power plants. In spite of the notables he quoted who predicted a doomsday scenario for the program, this is a success story that needs to be told—accurately.

The editorial refers to Joseph Stiglitz, a Nobel Prize–winning economist who opposed the privatization of the United States Enrichment Corporation (USEC) in 1998, insisting that a private-sector company has no incentive to make this national security program work. Events show that he was wrong then and is still wrong today.

Signing of the contract agreement between USEC and TENEX in Moscow for the "Megatons to Megawatts" program on 27 February 2002. Shown are Vladimir Smirnov (left), General Director for TENEX, and Philip Sewell, Vice President of Corporate Development and International Affairs for USEC.

First and foremost, the Megatons to Megawatts nonproliferation program is alive and well and has an 8-year track record of successful results. The program is nearly 40% ahead of the goals established in the original 1993 agreement. Over 140 metric tons of high-enriched uranium (HEU) bomb material have been diluted into fuel suitable for electric power plants, which is about 30% of the total 500 metric tons of bomb-grade HEU under contract to be converted. An estimated 5600 potential nuclear warheads have been eliminated by this program to date, and more are eliminated each year, lessening the chances that terrorists might gain access to such material. USEC has paid Russia about $2.5 billion over the past 8 years to facilitate conversion of nuclear warhead material into fuel for use in U.S. nuclear power plants, which produce 20% of America's electric power.

The new contract amendment recently signed by USEC and TENEX in Moscow sets mutually acceptable terms that will apply through the completion of the contract by 2013. Shipments for 2002 are expected to begin on schedule this month.

As might be expected of an international program of such magnitude, there have occasionally been complications and differences that have had to be resolved during negotiations. Unfortunately, a determined set of critics and special interests continue their efforts to undermine the recent USEC-TENEX negotiations and government approval process by generating a campaign of scare stories and accusations, predicting the collapse of this national security program. Despite the alarmist media reports, this familiar litany is baseless.

The Megatons to Megawatts program has been successful in destroying nuclear warhead material, and this national security goal has been achieved with funding from the private sector, not with taxpayer money, demonstrating that the Megatons to Megawatts program has been able to combine the goals of national security, nonproliferation, and private-sector financing.

Spokespersons for the Russian and U.S. governments and their executive agents have publicly confirmed their satisfaction with the outcome of the negotiations and adoption of terms for the remaining 12 years of the program. The respective governments are reviewing the matter and will likely give their approval soon.

We invite your readers to check on the progress of the Megatons to Megawatts program by visiting our Web site at www.usec.com. Results count—5600 nuclear warheads have been eliminated to date.

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AS THE ORIGINATOR OF THE PROGRAM TO convert Russian nuclear weapons to U.S. electricity (the converted weapons now provide 10% of U.S. electric power), I second the views expressed by Donald Kennedy in his editorial. However, although Joseph Stiglitz got it right about USEC's conflict of interest in the Megatons to Megawatts program, it was for the wrong reason. Stiglitz and others believed that USEC would fail to take deliveries of low-enriched nuclear fuel blended down from Russian weapons uranium because the price paid Russia would be above USEC's own domestic production cost for such fuel. But USEC's costs for producing low-enriched uranium fuel are actually well above what it pays Russia for the equivalent fuel, and the company should prefer to pay Russia rather than produce the material itself. Stiglitz was right that USEC puts its business interests ahead of the na-

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tional interest. The problem is that its efforts to do so are unchecked by the government. Indeed, for reasons that are a mystery to many, the United States has given the company an exclusive franchise to purchase the blended-down weapons material from Russia. The company is using that government franchise to dictate such low prices to Russia—and large profits for itself—that it threatens the continuation of the Megatons to Megawatts deal.

Funds from the deal are essential to maintain stability in the Russian weapons complex and keep fissile material and weapons capabilities out of the hands of terrorists and states that threaten world and regional security. Increased profits for the U.S. agent reduce funds available to Russia for guards, physical security, and the already paltry wages for sensitive personnel.

It is far easier to secure such dangerous materials and capabilities at the source than to interdict them or deal later with the consequences of misuse. The Bush administration needs to get its priorities straight.

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Response

YULISH MAKES AN ENERGETIC CASE FOR THE past success of the Megatons to Megawatts program. Much of the gain he cites, however, reflects a 5-year agreement signed well before privatization took effect. The concern identified in *Science*'s editorial was what would happen after that agreement expired, when USEC's conflicting obligations to investors and security would emerge. Some new reassurance is partly concealed amidst Yulish's rhetoric about "critics and special interests." It is that USEC now has an agreement with the Russians to which the respective governments "will likely give their approval soon." We do hope so; that would be good news.

One should ask, however, how security and profitability will be integrated in this and other future arrangements. It may be helpful to follow Yulish's advice and consult the USEC Web site. There one finds a response to a "frequently asked question": whether USEC asked the U.S. government to subsidize its purchase of the Russian material. The answer? "No. Based on the 1996 fixed price agreement, USEC was losing money on this deal due to a steep decline in market prices. The Russian government declined to change the contract terms, however, until the new contract was scheduled to go into effect in 2002. USEC worked with Russian and U.S. government agencies to restore profitability to the contract. USEC did not ask to be subsidized

but did ask to be reimbursed for the difference between the market price for enrichment and the higher price USEC was paying to Russia."

Readers of *Science* will doubtless know how to make the distinction between subsidy and reimbursement in that assertion. It seems that I was wrong to argue that national security objectives are incompatible with return on investment in a privatized USEC. They aren't, as long as the government guarantees the investors their right to "restored profitability." What business wouldn't want that deal?

DONALD KENNEDY

Aristotle's View of a Creator

IN HIS ESSAY ON GALEN ("LOGIC, LEARNING, and Experimental Medicine," *Science*'s Compass, 1 Feb., p. 800), Vivian Nutton writes that "[Galen] was convinced, like Aristotle, that the body had been carefully designed by a provident and purposeful creator." I find this statement misleading. Regardless of what Galen's views were, Aristotle did not believe in a provident and purposeful creator. Because for him the world had existed from eternity in the same basic form, there was no role for a creator. The God depicted in Book 12 of the Metaphysics spends his time happily thinking his own thoughts with no concern for the sublunary realm. Aristotle did believe that the body was organized to achieve certain functional goals, but for him this was a matter of the course of nature and not of conscious design.

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CORRECTIONS AND CLARIFICATIONS

SPECIAL ISSUE ON BODYBUILDING: The Bionic Human: "If I only had a..." (8 Feb., p. 995). The credit for the illustration in the bottom left-hand corner was incomplete; it should have read "Boing-Boing the Bionic Cat™. Illustrated by Ruth Denise Lear. Copyright the American Ceramic Society. All rights reserved."

PERSPECTIVES: "Mediator meets morpheus" by M. Meisterernst (8 Feb., p. 984). Unpublished information regarding the configuration of CRSP induced by the COOH-terminal domain of RNA polymerase II was inadvertently included as a result of an editorial oversight. Citation of reference (*12*) for this unpublished result is also in error. The remaining reference to (*12*) in the Perspective is correct.

NEWS FOCUS: "Fast technology drives new world of newborn screening" by E. Marshall (14 Dec., p. 2272). On the map on page 2274, the number of disorders in newborns that are screened for in Wisconsin is 21, not 9, as was indicated, and Wisconsin should have been colored red to indicate that it has mandatory screening for medium-chain acyl-CoA dehydrogenase (MCAD) deficiency.

Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 months or issues of general interest. They can be submitted by e-mail (science_letters@aaas.org), the Web (www.letter2science.org), or regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.