

Editor's Note

Under the proposed U.S.–India deal of July 18, 2005, India undertook to identify a list of civilian nuclear facilities that would be put under international safeguards. When this list was compiled, the Indian Department of Atomic Energy declared that the facilities related to India's breeder reactor program would not be put under safeguards. This opens up the possibility that India could use its 500 MWe prototype fast breeder reactor now under construction to produce weapon-grade plutonium in the blankets of the reactor. The first article in this issue, by Alex Glaser and M. V. Ramana, analyzes this possibility. Based on detailed neutronics calculations, the authors conclude that the proposed breeder could indeed produce up to 140 kg of weapon-grade plutonium per year and do this on a sustained basis.

It is widely recognized that a radiological dispersal device (RDE or "dirty bomb") in which radioactive material is dispersed by a conventional explosive could have significant public-health and economic impacts. In the second article here, J. Magill and co-authors seek to develop a framework to assess these impacts by examining and contrasting three different radioactive sources—cobalt-60, spent civilian nuclear fuel, and fresh mixed-oxide (MOX) fuel. The quantities chosen are a 1.8 gram capsule of Co-60, typical of a capsule used in cancer treatment, 2 kg of spent light water reactor fuel, and 2 kg of fresh MOX fuel. The intent of the authors is not to justify these quantities as the most plausible for a dirty bomb, but rather to use them as standards from which more detailed analyses could be made by other investigators using different radioactive sources. Because the plausibility of the specific scenarios chosen is thus not addressed, the authors do not attempt any overall assessment of the impacts of dirty bombs if they are used except to emphasize that fear, panic, and economic dislocation are far more to be expected than large numbers of fatalities, and to underscore that the consequences of an RDE are much less severe than those of a nuclear explosion.

The third article, by Geoffrey Forden, describes the construction and potential uses of a user-friendly program for simulating ballistic missile trajectories. The program itself is freely available at an MIT website given in the article. By allowing the user to simulate trajectories of missiles with one, two, or three stages in a framework of a round, rotating Earth, the model promises to be of great value in the analysis of a wide range of security issues—touching, for example, the capabilities of North Korean missiles, the effectiveness of ballistic missile defenses, the threat of anti-satellite weapons, and others.

Finally, this issue includes a tribute by Victor Gilinsky and Marvin Miller to Paul Leventhal who died this past April. Paul was a relentless, imaginative, and effective campaigner for ways to strengthen the nonproliferation regime, and a friend to many of us. He will be missed.