

process in Russia could be part of the answer. Some of the answer could also be had in maximizing foreign participation in alternative approach (3), the construction and operation of a new reactor in Russia. In this case the Agreement would be altered to allow for the introduction of new LWRs at some point in the process.

What then of the safety and environmental effects of (3) as it concerns a new breeder reactor? Three variations stand out. The first would in effect put WGPu disposition on hold until a Russian reactor had been built. Done in Russia mainly by Russians, as with the BN-800, could be one route here. The BN-800, however, is the BN-600 writ large. As such, it could present substantial and avoidable risks to safety and the environment in Russia, which is to say nothing of the impression its business plan might create (Kuznetsov et al., 2001). Perhaps therefore the Agreement would better be put on hold to allow for an international consortium to develop, build, and later to operate a new breeder in conformance more with global than Russian standards. Or, in a third variant, and like a new LWR, a new Russian-designed breeder could be internationally built for introduction into the process envisaged under the Agreement. This would be done to make the Agreement more cost-effective, more appealing to more participants, and, owing to enhanced foreign participation, more benign in terms of safety and the environment than if Minatom were left to its own devices.

This said, variants of approach (3) are deficient in comparison with the export-only (4) alternative that's suggested for consideration by the United States. After all, if we focus tightly on nuclear safety and environmental protection, and if both fare better when less is done in Russia, why take a single step beyond fuel fabrication when foreign reactors are available to do the main part of the job in getting to the spent-fuel standard?

So as not to leave a false impression about the export-only alternative and, by extension, all the others, we should note that confining disposition to disassembly, conversion, and fuel fabrication in Russia still requires industrial activity on a very large scale.⁷ Over and above MOX fuel fabrication, imposing volumes of nuclear-materials transportation and storage would have to be handled without mishap for all steps of the process within Russia's frontiers including storage of returned spent fuel until reprocessing could begin. The point here cuts two ways: not only is doing everything in Russia, as the Agreement requires, more problematic than it should be for safety and the environment, but even the alternative that's most elegant for these purposes still offers plenty of scope for things to go off the rails.

To begin to order our findings up to this point, nuclear safety and environmental protection correlate strongly and positively with approaches which aim to increase the cost-effectiveness of spent-fuel disposition beyond what can be done under the Agreement. When Russia's reactor deficit is countered by the export of its excess WGPu in MOX fuel or, to a lesser extent, by the introduction of new internationally sponsored reactors, nuclear safety and the environment within Russia naturally benefit. Whether new reactors ought to be burners or

⁷ If fresh military MOX is 5 percent WGPu plus up to 12 percent blend stock, disposition at a rate of four tonnes per year would require an average annual production of 80 tonnes of fuel. Add cladding and fuel assemblies, and annual production in Russia would be about 120 tonnes. Then increase the average yearly export rate to eight tonnes, and gross annual production rises to 240 tonnes.