

# A NEW APPROACH TO THE NUCLEAR FUEL CYCLE

## Frequently Asked Questions

### **Q: What's different, what's new with this approach?**

**A:** This approach is new for three reasons:

1. It's comprehensive—it covers the front- and back-end of the nuclear fuel cycle AND it addresses nuclear proliferation and as well as nuclear security concerns.
2. It uses best practices as a unifying feature—if countries/experts can agree on best practices, it should be easier to craft policies that reflect those best practices.
3. It leverages market trends instead of using market mechanisms to solve political problems.

### **Q: Why should we do this now?**

**A:** The Nuclear Security Summit process is likely to end after mid-2016 and, with that, high-level attention to the risks that weapons-usable material pose. While that process continues, it would be useful to highlight how decisions about fuel cycles affect nuclear security and nonproliferation.

### **Q: Why should we care?**

**A:** The ongoing concerns about what kinds of fuel cycle capabilities Iran should have illustrate the risks that sensitive technologies and materials can pose.

### **Q: How will you persuade nonnuclear weapon states that have traditionally been resistant to anything they think restricts peaceful nuclear energy? What about Article IV of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)?**

**A:** There are a few incentives for nonnuclear weapon states that traditionally have been resistant: efforts to help countries deal with future nuclear waste; a levelling of the playing field in terms of costs/burdens between nonnuclear weapon states and nuclear weapon states; and improvements in nuclear security (at significant cost to states that have high enriched uranium [HEU] and separated plutonium [Pu]). With respect to Article IV of the NPT, this approach will confirm all countries' rights to peaceful nuclear energy while it provides greater protections against abuse across the board.

### **Q: What will this cost?**

**A:** The biggest costs are for safeguards equipment and inspections, but some benefits could be the influx of direct foreign investment in enrichment and reprocessing and, possibly, streamlining of efforts in bilateral nuclear cooperation agreement negotiations.

### **Q: Who's really interested in enrichment and reprocessing anyway? Isn't this a nonproblem?**

**A:** Japan's enrichment and reprocessing capabilities at the moment are not clearly linked to use. South Korea would like to acquire enrichment and reprocessing capabilities, and countries like Vietnam have not ruled them out. As long as countries maintain that they would like to keep the option open, a system of best practices is needed to reduce the risk of misuse of these technologies.

### **Q: Would this affect Iran now or in the future?**

**A:** Yes. If Iran cooperated, it would have to multinationalize its sensitive fuel cycle facilities, agree not to pursue fast breeder reactor research, implement controls on sharing its technology (black-boxing), and forego use and production of HEU and development of fast breeder reactors.

### **Q: What incentives would industry have to cooperate? What exactly would it have to do?**

**A:** Fuel service providers outside of the nuclear weapon states would have an incentive to cooperate because safeguards requirements would be levied on their competitors in the nuclear weapon states. They would have to seek partners with respect to finance, operation, and ownership of their facilities. Unsafeguarded facilities would need to be inspected. Some measures to retrofit safeguards equipment and techniques may be necessary.

### **Q: How would you implement the provision to stop reprocessing until Pu stockpiles are eliminated?**

**A:** Reprocessing would not automatically stop since schedules would probably need to honor existing contractual obligations as well as take into account operational requirements of facilities.

Whatever protocols are agreed upon among reprocessing facilities, these should be more robust than what is currently reported and implemented.

**Q: Does this system address military HEU and Pu?**

**A:** There are two issues here: existing military HEU and Pu, and future production of HEU and Pu for military purposes. Obviously, there is a lot of HEU and separated Pu in military stockpiles—some for weapons use and some for other military purposes like naval reactors. Reducing those stockpiles should be pursued on a parallel track, but that is a different kind of negotiation.

With respect to production, the requirement to place all enrichment and reprocessing plants under safeguards constitutes a de facto ban on producing fissile material for nuclear weapons. Most nuclear weapon states (the United States, the United Kingdom, Russia, China, France, Israel) no longer produce fissile material for weapons purposes. For those states, the most pressing question would be how to handle nonexplosive military uses of HEU and Pu, such as HEU-fuelled reactors on submarines and other naval vessels. Given that the use of HEU in naval reactors is a military, nonexplosive purpose that is not prohibited by the NPT, countries would have to agree to explore alternatives to HEU and Pu in military applications.

Non-NPT members like Pakistan, India, and North Korea that still produce fissile material for weapons will likely object to the requirement to safeguard all enrichment and reprocessing facilities.

**Q: How would this new system affect countries outside of the NPT (e.g., Israel, Pakistan, India, and North Korea)?**

**A:** NPT membership is not a prerequisite for participation in the Best Practices approach, but since nonparties to the NPT have unsafeguarded enrichment and reprocessing capabilities, the hurdles could be significant. Such states would not have to put all facilities under safeguards, but they would have to put all enrichment and reprocessing facilities under safeguards. They would have to implement an Additional Protocol (much like the nuclear weapon states), adhere to INFCIRC/225, etc. Their fuel cycle facilities would have to have diversified (not purely national) ownership, operation, and/or management. If they did not participate in the system, they would be

barred from nuclear trade. Of the states outside the NPT, India would likely incur the greatest costs if it did not join this regime because of its excepted status to Nuclear Suppliers Group (NSG) guidelines. In other words, other countries would continue to be barred from nuclear trade because of their non-NPT status, while India might experience a reimposition of the ban lifted in 2008.

**Q: Can the International Atomic Energy Agency (IAEA) increase its capacity sufficiently for these new tasks?**

**A:** The bigger issue is commitment by states to put up the requisite resources. The IAEA should be able to do more with more funding, although this undoubtedly will be a phased process.

**Q: What is the balance of costs between technology holders and nontechnology holders?**

**A:** There are likely more costs to technology holders than to nontechnology holders. Of all the requirements, the facility-specific ones are the most onerous, affecting existing technology holders. Nontechnology holder states would commit to ensuring that any future enrichment and reprocessing facilities have diversified ownership; this could be viewed as a cost or benefit. Benefits for nuclear newcomer states include a greater focus/attention to potential solutions to nuclear waste disposition and eventually an easing of prior consent requirements.

**Q: Does this do anything to alleviate the risks posed by countries like Pakistan?**

**A:** Pakistan poses a variety of nuclear security and proliferation risks because of its nuclear weapons and nuclear facilities. The Best Practices approach is focused on reducing risks from sensitive nuclear technology proliferation. While Pakistani participation in this approach would yield significant benefits for nuclear security and nonproliferation, it would not alleviate all of the risks presented by Pakistan. Further, Pakistan is unlikely to join the Best Practices approach until it could safeguard all of its reprocessing and enrichment plants (effectively ending fissile material production for weapons).

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