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Nuclear 'return addresses'

During the Cold War, the ultimate U.S. nightmare involved a nuclear attack by the Soviet Union. But the certainty that the United States would retaliate in kind — known as MAD (for mutual assured destruction) — kept nuclear weapons locked in their silos.

Today, the nightmare is that terrorists could obtain a nuclear device and detonate it in a major U.S. city. Such an attack could kill thousands or even millions — and would generate overwhelming pressure for retaliation.

But against whom? Without knowing the "return address" of the nuclear device, it would be impossible to strike back. And if the terrorists' suppliers know the nuclear materials cannot be traced back to them, a policy of MAD loses its deterrent value.

That's why "nuclear forensics" — essentially the science of identifying the DNA of nuclear materials — needs a new and urgent emphasis.

Since the Cold War ended, nuclear material and expertise have proliferated with fewer safeguards. Nuclear materials in the former Soviet Union are not always well secured. Iran is developing nuclear weapons and has links with terrorist networks. The father of Pakistan's nuclear bomb has sold technology and know-how. Ditto for the erratic leader of North Korea. The list goes on.

Given the new realities, it makes sense to focus on being able to identify and trace nuclear materials and those who handle them, much as criminal forensic experts home in on DNA or fingerprints.

A new report by the American Physical Society and the American Association for the Advancement of Science offers a useful blueprint.

At home, the key recommendations involve developing state-of-the-art equipment and training enough scientists with nuclear forensics expertise. Only about 35 to 50 now work at U.S. national

laboratories, far fewer than would be optimal to identify the source of an explosion set off by a faceless enemy.

International cooperation on nuclear forensics requires everything from building databases to overcoming suspicions that the United States has ulterior motives. One possible forum is the existing Global Initiative to Combat Nuclear Terrorism, co-chaired by the United States and Russia, which own more than 90% of the world's nuclear weapons and related materials.

The best defense, of course, is to keep those weapons and materials out of the hands of terrorists and rogue regimes in the first place. But if that fails, nothing is more important than the ability to trace a weapon back to its source.

