Summary Statement of the Union of Concerned Scientists to the Blue Ribbon Commission on America's Nuclear Energy Future, Reactor and Fuel Cycle Technology Subcommittee

Dr. Edwin S. Lyman
Senior Staff Scientist, Global Security Program, UCS
October 12, 2010

#1. A major obstacle to reducing proliferation risk is the continued commercial production of plutonium. The U.S. can help to put the brakes on this practice by getting the geologic repository program back on track, demonstrating that safe and secure direct disposal of spent fuel is both technically and politically feasible. Technical approaches to reduce the risks of reprocessing, whether by improving safeguards technologies or by developing advanced closed fuel cycles, are unlikely to be effective, and it would be helpful if the U.S. government were to discontinue conveying the impression that transformational technologies could save the day. The U.S. also could apply significant influence on the fuel cycle policy of other nations through its bilateral nuclear cooperation agreements, but it has failed to take full advantage of these authorities.

#2. The assessment of proliferation risk is a complex undertaking that involves a host of technical and political factors, and is rife with subjectivity and uncertainty. To address these uncertainties, it is essential to base these assessments on conservative judgments of the capabilities of both state and non-state actors. One should not limit the scope of analysis by mirror-imaging the adversary or by fighting yesterday's battles.

#3. The credibility of the international safeguards system can be strengthened by minimizing the disparity in obligations between nuclear-weapon and non-nuclear weapon states. To this end, the U.S. should lead by example and place all proliferation-sensitive fuel cycle facilities on the list of those eligible for IAEA safeguards. For new plants, this should entail providing design information to the IAEA upon the decision to construct, affording IAEA the opportunity to develop a verification approach early in the design and construction process. The U.S. should also take the lead in developing a financing mechanism that will provide the IAEA with the resources necessary to apply safeguards in weapon states. An alternative approach to eliminating disparities would be to place all fuel cycle facilities, whether in weapon- or non-weapon states, under the control of a new international entity with its own safeguards agreement.

#4. For control of proliferation and terrorism risks, the "polluter pays" principle should apply. That is, facilities that handle proliferation-sensitive materials should be assessed a tax commensurate with the danger posed by the materials and the cost of the appropriate level of safeguards and security. However, cost is not the only factor: it may be impossible to render such facilities sufficiently secure even if funds were unlimited.

#5. In the strictest sense, physical protection cannot be "risk-informed" because the probability of an event is a fundamental component of risk, and probabilities cannot be calculated for scenarios that involve deliberate actions, such as theft of weapon-usable material. Some speak of "risk-informing" physical protection as a way to reduce security requirements on certain items containing weapon-usable material, such as mixed-oxide fuel, based on the perception that such items are less attractive to terrorists. These proposals are misguided because they make tacit assumptions about the limited capabilities of adversaries that are likely to be unrealistic today, and are bound to become even more unrealistic as the tactical skills, technical knowledge and weaponry of terrorist groups continue to grow more sophisticated. We believe a truly risk-informed analysis of the threat of nuclear terrorism would lead to significant increases in security requirements for weapon-usable materials across the board and would ultimately discourage the continued production of such materials.

#6. NRC regulations should require that safeguards and security be fundamental considerations in the design of all new nuclear facilities, which is not the case today. NRC regulations do require an evaluation of the "safety-security" interface when licensees make changes to either the safety or security configuration of a nuclear power plant; such evaluations should be extended to fuel-cycle facilities.