AGA 3: Nuclear Nonproliferation

Time: Thursday 10:00–12:30 Location: B 0.014

Invited Talk AGA 3.1 Thu 10:00 B 0.014

The Long Road: From Eisenhower's 1953 "Atoms for Peace" to the IAEA Low Enriched Uranium Bank in Kazakhstan — •Tariq Rauf — Vienna

On 8th December 1953, US President Eisenhower in his "Atoms for Peace" speech at the UN called on States to make joint contributions from their stockpiles of natural uranium and fissionable materials to an International Atomic Energy Agency [IAEA]"[to] provide special safe conditions under which such a bank of fissionable material" would be allocated to "provide abundant electrical energy in the power-starved areas of the world." A half century later, in 2003, IAEA Director-General ElBaradei called for a new approach to the sensitive parts of the nuclear fuel cycle "uranium enrichment and plutonium separation" that would assure supplies of low enriched uranium (LEU) for civilian uses and preserve States" nuclear fuel cycle options while minimizing the establishment of additional enrichment and reprocessing capabilities. On 29 August 2017, the storage facility for the IAEA LEU Bank was inaugurated at the Ulba Metallurgical Plant in Kazakhstan. This presentation will describe the evolution and development of the IAEA LEU Bank

Invited Talk AGA 3.2 Thu 11:00 B 0.014

SILEX Laser Enrichment Technology and Its Proliferation Implications — •Ryan Snyder — United Nations Institute for Disarmament Research, Geneva, Switzerland

Efforts to develop a commercially viable laser-based process for uranium enrichment have been ongoing since the discovery of the laser in 1960. After limited success with various atomic and molecular laser isotope separation techniques, a new process that relies on the concept of condensation repression may yet prove commercially successful. One example of this technique is the SILEX (Separation of Isotopes by Laser Excitation) process being developed by the Global Laser Enrichment (GLE) project, which can enrich uranium to weapon-grade levels using less space and energy than almost all centrifuge designs. Research programs worldwide are also developing laser systems capable of enriching uranium using this concept. The basic dynamics of the SILEX process will be presented here, along with physical space constraints and energy efficiency estimates for clandestine nuclear weapons production. The proliferation implications of successful commercial demonstration and continued worldwide development of relevant laser systems will also be discussed.

AGA 3.3 Thu 12:00 B 0.014

The Composition of the British Plutonium Stockpile — •Christopher Fichtlscherer — IANUS, TU Darmstadt, Darmstadt, Germany — ISR, BOKU, Vienna, Austria

The UK has the largest stockpile of civil plutonium worldwide. Different options on how to manage this stockpile are discussed, among others the use as MOX fuel in either fast or thermal reactors. When reusing the plutonium as fuel, the isotopic composition of the plutonium has a major impact on reactor operation, it influences safety parameters such as the reactivity coefficients but also the possible burn-up and the dose rate emerging from the spent fuel elements - an important factor when assessing the disposition of fissile material using a radiation barrier. The information on the composition of the plutonium is, however, scarce. By using the operation times and characteristics of all AGR and Magnox reactors in the UK, we try to make a useful estimation of the composition of the British civil stockpile. Since the half-life of e.g. plutonium-241 is only 14 years, different points in time also lying in the future are considered.