AGA 15: Safeguards Analysis and Verification

Time: Friday 10:30–12:00   Location: EMH 225

AGA 15.1   Fri 10:30   EMH 225

Systems Approach to Arms Control Verification — •Clemens Listner[1], Gotthard Stein[2], Morton J. Canty[1], Arnold Rezniczek[3], and Irmgard Niemeyer[1] — [1]Forschungszentrum Jülich, Jülich, Deutschland — [2]Berater, Bonn, Deutschland — [3]UBA GmbH, Herzogenrath, Deutschland

Using the decades of experience of developing concepts and technologies for verifying bilateral and multilateral arms control agreements, a broad conceptual systems approach is being developed that takes into account varying levels of information and risk. The IAEA has already demonstrated the applicability of a systems approach by implementing safeguards at the State level, with acquisition path analysis as the key element. In order to test whether such an approach could be implemented for arms control verification, an exercise was conducted in November 2014 at the JRC ITU Ispra. Based on the scenario of a hypothetical treaty between two model nuclear weapons states aimed at capping their nuclear arsenals at existing levels, the goal of this exercise was to explore how to use acquisition path analysis in an arms control context. Our contribution will present the scenario, objectives and results of this exercise, and attempt to define future workshops aimed at further developing verification measures that will deter or detect treaty violations.

AGA 15.2   Fri 11:00   EMH 225

Analysis of the IAEA reports about the Iranian nuclear program — Theo Köble, Wolfgang Rosenstock, and •Olaf Schumann — Fraunhofer INT, Euskirchen

Iran is running a nuclear program where many aspects are not perfectly consistent to the asserted civil use. It has developed and installed a large infrastructure e.g. centrifuge production and large scale uranium enrichment (to 20% U-235), the small Teheran Research Reactor and is constructing a large heavy water research reactor. Furthermore it operates the Russian build nuclear Power Plant in Buschehr. All these activities are not per se non-peaceful. But for instance the amount of uranium enrichment seems to be above the demand of Iran and building a natural uranium fueled, heavy water moderated reactor would give Iran an excellent opportunity to produce weapon-grade plutonium. In addition Iran has not proven very cooperative with the IAEA in the past.

A wealth of information about this issue is found in the IAEA reports of the Director General. All but the most recent of these reports have be derestricted and released to the general public. This talk gives an analysis the IAEA reports on Iran and summarizes the situation of the Iranian nuclear program.

AGA 15.3   Fri 11:30   EMH 225

Buildup of radioxenon isotopes in MOX-assemblies — •Thomas Gniffke and Gerald Kirchner — Carl Friedrich von Weizsäcker-Centre for Science and Peace Research, Beim Schlump 83, 20144 Hamburg, Germany, Tel +49 40 42838 7229, Fax +49 42838 3052, http://www.znf.uni-hamburg.de

Radioxenon is the main tracer for detection of nuclear tests conducted under- ground under the verification regime of the Comprehensive Nuclear Test Ban Treaty (CTBT). Since radioxenon is emitted by civilian sources too, like com- mercial nuclear reactors, source discrimination is still an important issue. Inventory calculations are necessary to predict which xenon isotopic ratios are built up in a reactor and how they differ from those generated by a nuclear explosion. The screening line actually used by the CTBT Organization for source discrimi- nation is based on calculations for uranium fuel of various enrichments used in pressurized water reactors (PWRs). The usage of different fuel, especially mixed U/Pu oxide (MOX) assemblies with reprocessed plutonium, may alter the radio- xenon signature of civilian reactors. In this talk, calculations of the radioxenon buildup in a MOX-assembly used in a commercial PWR are presented. Implications for the CTBT verification regimes are discussed and open questions are addressed.