

EURATOM Safeguards experience and future verification regimes

EURATOM Safeguards, the European Commission's Directorate implementing Nuclear Safeguards in the European Union, has the biggest body of inspectors for nuclear material control (Pu, U, Th) in the European Union and is approaching 60 years of experience implementing nuclear safeguards inspections.

In 2014 alone, 1234 inspections were carried out on site. The vast amounts of nuclear material include more than 870 t of Pu, almost 10 t of HEU and around 87000 t of LEU. The material is followed scrupulously by accounting for it, verifying the correctness of the nuclear operators' declarations by measurements and auditing the operators' accountancy and control systems. The facilities where the materials are handled or stored have to be declared to EURATOM in detail and the related activities and processes need to be fully understood by the safeguards inspectors. Detailed inspection approaches are developed and implemented on site in approximately 1000 material balance areas, covering the full fuel cycle, from mining and concentration plants through enrichment and fuel fabrication to research and power reactors, from reprocessing plants to MOX fuel fabrication and final repositories.

It is obvious that there is no other body with such a broad band of operational knowledge and expertise apart from the IAEA. Compared to the latter, EURATOM safeguards has the additional experience of inspecting nuclear weapons states (France and UK) in a comprehensive and non-discriminatory manner. The EURATOM safeguards mandate is identical across France, the UK and the 26 non-nuclear weapons states of the EU. While military material is not part of the scope of EURATOM safeguards in any state, it should be underlined that some facilities in the weapons states hold or have held civil and military material at the same time. EURATOM safeguards is thus unique as an international inspection body with long standing experience in such mixed facilities.

The most notable example might be the Magnox reprocessing plant in Sellafield, UK. When the UK joined the EU in 1973, the plant existed already – and had not been designed with international safeguards in mind. As it ran both military and civil reprocessing campaigns, it came under EURATOM safeguards with the entry of the UK to the EU. Today it is inspected as a fully civilian reprocessing plant and it is actually preparing for closure in the near future.

Furthermore, any nuclear material that is not to be used anymore for military purposes in the UK or France should, sooner or later, become subject to EURATOM safeguards and inspections. In this respect it needs to be remembered that, at the end of the 1990's, nuclear material (plutonium) that was stored in a major installation in the UK became (and from then on continues to be) subject to Euratom safeguards as a result of the UK Strategic Defence Review of 1998.

The decommissioning of installations that were previously used for defence purposes in the UK and France will result in additional nuclear material to become part of EURATOM safeguards at some stage.

With this background, it is considered that EURATOM safeguards could contribute in the context of future disarmament or arms control agreements. The available experience could be helpful in all phases of such agreements. In the preparatory phase, national experiences and views could be complemented by the international inspection experience. In the development phase for technology or approaches, the available technical expertise could be used to assess proposed technical solutions for their acceptability (example: information barriers, verification of separated plutonium).

For any credible future arms control or disarmament treaty, a verification scheme will have to be defined. The European Commission might be able to support the implementation of such verifications if the EU member states support such a role politically and provide required resources. Neither for a Fissile Material (Cut-off) Treaty nor for any other possible future arms control or disarmament treaty is it yet decided how verifications would be implemented. One often-quoted scenario is to add an extra task to the obligations of the IAEA. Alternatives are discussed as well: a scenario favoured by some is the set-up of a new institutional body focussing on verifications in those countries relevant under an arms control agreement. A third scenario could be a scheme based on peers inspecting each other. EURATOM safeguards has the necessary expertise to contribute to the development and implementation of any of the above scenarios, no matter which one is favoured politically.