

Chapter 10

Euratom Safeguards System



Stefano Ciccarello and Stephan Lechner

EURATOM Safeguards are an important cornerstone of global non-proliferation of nuclear materials and verification of their civil use. After 60 years of operations, EURATOM Safeguards are as important as in the beginning, but the steady growth of nuclear activities and the enlargement of the EURATOM Community have created several challenges for the years to come. New facility types and new technologies can be addressed, but the changing geopolitical situation, new asymmetric threats and the changing public perception of nuclear energy altogether will require new strategic thinking. Along the technical lines, a solid political positioning of EURATOM Safeguards is required, respecting international relations as well as the context of Energy Union, Security Union and Clean Energy for all Europeans.

Let me start by saying that it is an honour for me to speak about EURATOM Safeguards at this year's prestigious Amaldi Conference. And this even more so in the year of the anniversary of the EURATOM Treaty which was signed here in Rome 60 years ago, in 1957.

Before addressing future challenges in nuclear safeguards, it is my intention to look back briefly at those 60 years of EURATOM history, a history marked by a balance between progress and stability.

As we are going to see, there has clearly been a lot of progress in the development of nuclear energy since 1957, but it is only fair to say that also the world around us has changed significantly.

Through all these sixty years, the EURATOM Treaty has been an element of stability, and the articles of its Chap. 7 are still the cornerstone to nuclear safeguards in the EU.

S. Ciccarello (✉) · S. Lechner
European Commission, Directorate General Energy, Luxembourg, Luxembourg
e-mail: stefano.ciccarello@ec.europa.eu

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But how is the European Commission involved? The role of the European Commission with respect to safeguards is clearly laid out in Article 77 of the Treaty.

The Commission shall satisfy itself that in the territory of the Member States:

- ores, source materials and special fissile materials are not diverted from their intended use as declared by the users and that
- the provisions relating to supply and any particular safeguarding obligations assumed by the Community under an agreement concluded with a third State or an international organisation are complied with.

So the role of the European Commission is complex, and it is two-fold, covering on one side non-diversion and on the other side non-proliferation aspects of international agreements with the IAEA and Supplier Countries. At the same time, this role is very operational and highly technical.

In implementing this role, the European Commission has developed a well-established and fully recognized safeguards system. This system, which in the sixties was only controlling 29 mines in operation and approximately 140 installations, currently monitors around 700 installations and more the 1,500 small holders of nuclear materials.

The secondary legislation on nuclear materials accountancy entered into force in 1959 and was further updated in 1976 and 2005. From the initial 350 monthly inventories and balance sheets, the European Commission now verifies around 9,000 accountancy declarations per year.

The EURATOM body of inspectors was established in May 1960. At the end of the same year, inspections were already carried out in all the Member States that had nuclear installations.

Today, more than 130 EURATOM Inspectors of different nationalities are working for this system. In 2016, they have performed 1 167 onsite inspections. Almost 10% of them were unannounced.

All of them are permanent EU officials, all of them are security cleared and all of them are formally accredited at all EU Member States.

Almost 60 percent of these inspectors have an experience on the job of more than 15 years. This rich experience is continuously passed-on to younger colleagues to ensure continuity.

EURATOM inspectors are verifying a number of nuclear installations globally holding 99.99% of all materials under safeguards every year. The remaining 0.01% is scattered in very small quantities over a large number of small holders for which special safeguards approaches are applied depending on the sensitivity of material and activity.

All across this time, ad hoc technology has been developed and deployed, at Headquarters or on-site, from measurement techniques to containment and surveillance tools, from automatic processing of declarations to remote data transmission of monitoring devices on site.

But we could not do this job all on our own or in splendid isolation.

EURATOM Safeguards are performed in close partnership with the IAEA. The Comprehensive safeguards agreement of 1973 acknowledged the existing EURATOM safeguards system and clearly spelled out that “the Agency Shall Take Due Account of the Effectiveness of the Community System of Safeguards”. Today’s collaboration is discussed and designed in formal working groups and committees and it manifests itself on the ground by hands-on collaboration in the field. As an example, around 60% of EURATOM inspections are performed jointly with the IAEA. Verification equipment costs are shared.

EURATOM Safeguards also are maintaining a large number of stakeholder relationships, including Member States authorities, supplier states, technology research centres such as the Joint Research Centre of the EU, Universities and United States Laboratories, international associations and the EURATOM Supply Agency.

But there is no reason for resting on the laurels of a success story of 60 years, as we know that the world around us is in continuous development.

Safeguards also need to adapt to the changing world around them. The State Level Concept is an example for such adaptation on the part of our partners in the IAEA.

Also EURATOM Safeguards are in a process of continuous improvement. Heavily dependent on technology, EURATOM continuously enhances and modernises its tools. The internal procedures are currently being updated, addressing how to deal, inter alia, with occasional measurement uncertainties and inconclusive results.

In addition to addressing well-known issues, there are new challenges for nuclear safeguards from various directions:

- A new emphasis will have to be devoted to the back-end of the nuclear fuel cycle. Ending nuclear energy production does not put an end on safeguards requirements. In the EU, there is more and more activity on intermediate or long-term storage of spent fuel and nuclear waste particularly in connection with the phasing out of nuclear energy, closing down and decommissioning of nuclear plants.
- New types of nuclear installations need to be addressed: long term and final repositories for spent-fuel and waste are being built in the EU, and they require a specific approach.
- New technologies need to be assessed: tomography might be used successfully for future verification activities.
- New threats will have to be addressed as terrorist plots have related to nuclear installations and drone overflights have been sighted in the EU. This adds a new dimension to the importance of safeguards and non-proliferation of nuclear materials.
- In addition to all of the above, the digital era has also arrived at nuclear safeguards: On one hand, we are making good use of digital tools, equipment, and nuclear material accountancy systems, on the other hand this digitization has created new cyber security threats.

Obviously, new technologies form part of our challenges. Thus, we need to look ahead, and technology research is an important element for future safeguards.

In 2016, EURATOM Safeguards have defined four priorities for areas of research and technology support:

- Number one is the maintenance of an operational capability to analyse samples from the nuclear fuel cycle, currently mostly performed in two major on-site laboratories in Sellafield and La Hague. In the short run, we cannot provide reasonable and substantiated safeguards without this capability.
- Number two is the traditional development of new measurement tools or the improvement of existing tools, including equipment for containment and surveillance. This is an evolutionary approach on well-known research pathways.
- Priority number three is to get a better understanding of the applicability of standard off-the-shelf technologies for nuclear safeguards. New sensors, digital CCTV systems, robotics, integrated encryption and similar areas have made major progress in the last decade, and technologies that were completely unthinkable for safeguards application years ago might soon be promising candidates.
- The last priority is even more revolutionary, and is connected to the world of data. The wealth of data in EURATOM's nuclear materials accountancy system could be used more systematically than today for intelligent analysis.

The existing data checks for coherence and completeness of nuclear declarations are already extremely helpful, but the world of big data around us has much more to offer. Obviously, we cannot put sensitive EURATOM data out into the open cloud, but there are also ways to develop better analytical tools and instruments inside our secured environment.

In a world of scarce resources, it should be noted that findings from data analysis are usually more efficient than extensive site visits or changes of equipment in the field.

In the area of technology, there are well known risks from the dependency on single technology suppliers and we need to tackle them in a structured way.

There are additional risks from the fact that the nuclear expertise in the EU might be more difficult to maintain as a number of our Member States are planning less nuclear power in the future.

We are currently also preparing the departure of one of our Member States from the EU as well as from EURATOM and we are fully aware that this will have its implications also for the EURATOM safeguards.

We need to keep in mind that in its last Illustrative Programme for Nuclear Energy and Investment (PINCE), issued in 2016, the European Commission is underlining that while EU countries are free to decide their energy mix, those EU countries which decide to use nuclear energy have to apply the highest standards of safety, security, waste management and non-proliferation as well as diversify their nuclear fuel supplies.

Given this enormous evolution of our wider technological, economic, and political context, it is clear that we need to better connect our nuclear safeguards approach to the emerging policy landscape, if we want to make it future-proof.

Safeguards and non-proliferation require collaboration and exchange of information all across the European Union, and beyond. The concept of a European Security Union, recently introduced on European level, also foresees a respective approach.

Other policy areas relevant to nuclear (and also to safeguards) include cyber security, trade, climate and energy or industry, all four of them among the five priorities presented by President Juncker for the European Commission's Agenda in 2018.

So technically, politically and internationally, there is a lot to be done—and we might not have another 60 years to get it all addressed.

A discussion process on all these new developments has, of course, already started, partly at ESARDA, partly at the INMM conference in the US. There was a very positive echo on new and fresh thinking in safeguards opportunities, and I am convinced that some of the proposed strands will lead to even better and more efficient safeguards in the future.

On political level, the President of the European Commission, in the letter to the Presidents of European Parliament and European Council accompanying his State of the Union Speech of September 13th has underlined his intention to present a communication in order to further advance the discussion on energy and climate—and, in this context, to also discuss about the future of the EURATOM Treaty. This discussion will start with the Council meeting in June 2018.

Looking at all of the challenges, the political uncertainties, the pace of change, the complexity of issues—should we start worrying about future safeguards?

I do not think so. Instead, we should make sure that we have a clear understanding of the challenges around us and get them addressed appropriately.

This conference unites representatives of the stakeholders of the EURATOM Treaty, one of the most successful and lasting nuclear agreements in the world. So here in Rome, once again, we have all the competencies it takes to shape the future ourselves.

I would thus like to finish my intervention with a quote of Marie Curie:

Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less.

So let's never stop in our efforts to understand more and fear less.

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