The European Commission Cooperative Support Programme: Activities and Cooperation

João G. M. Gonçalves[1], Said Abousahl[1], Yetunde Aregbe[1], Willem Janssens[1], Klaus Lützenkirchen[1], Paul Meylemans[2], Peter Schwalbach[2]

European Commission: Joint Research Centre[1] and Directorate General for Energy[2]

Contact: joao.goncalves@jrc.ec.europa.eu

Abstract:

The International Atomic Energy Agency (IAEA) bases its technical and scientific programme on voluntary contributions from Member States, constituting the Member States Support Programme (MSSP). The European Commission Cooperative Support Programme (EC-SP) started in 1981 to support IAEA activities in the field of nuclear safeguards. Since its beginning, the EC-SP has been operated by the European Commission's Joint Research Centre in close collaboration and coordination with the European Commission's Directorate General for Energy – Directorate Nuclear Safeguards implementing the EURATOM treaty. EC-SP tasks provide technology and expertise in technical areas related to the effective implementation of safeguards verification measures including the detection of undeclared materials, activities, and facilities. The EC-SP fosters cooperation with Support Programmes from European Union Member States, as well as with non-EU states with which the European Commission has specific research and development agreements, e.g., the United States Department of Energy, ABACC. Information on the research and development activities under these frameworks is shared with the IAEA and complements core EC-SP work. The paper describes the EC-SP, its modus operandi, collaborations, and main activities, namely, (a) the specific R work as part of tasks with well-defined milestones and deadlines, (b) training activities; (c) the technical support in establishing Safeguards guidelines and approaches and (d) the technical consultancy support to IAEA meetings and expert groups.

1. Introduction

The European Commission Cooperative Support Programme to the International Atomic Energy Agency (IAEA) in the field of research and development in Nuclear Safeguards – EC-SP – was officially created on the 7th of May 1981 with an exchange of letters between Directors of the European Commission and the IAEA. Since then the EC-SP has been involved in more than 130 tasks in different scientific, technical and application areas of Nuclear Safeguards.

The EC-SP is an integral part the European Union's nuclear non proliferation policy [1]. Within the framework of the EURATOM Treaty (1957), the European Commission's Directorate General for Energy (ENER) implements a European Union wide Regional System of Nuclear Material Accountancy and Control (RSAC) [2]. The Joint Research Centre – JRC, a sister Directorate General from the European Commission, provides, among others, the research, development and technical support to this RSAC and to the IAEA. JRC technical activities contribute to the improvement of the implementation of Nuclear Safeguards and, in a wider view, to the implementation of nuclear non-proliferation policies.

This paper reviews the main EC-SP activities. After a historical background and description of the current modes of operation, the paper highlights recent achievements of the EC-SP and ends with some discussion on current practices and future. Related additional work is reported at this conference [3].

2. Historical Background

In 1957, the EURATOM Treaty, establishing the European Atomic Energy Community, was signed. The executive Commission of EURATOM (today, the European Commission) was mandated to implement the EURATOM Treaty, including all Nuclear Safeguards and verification measures. In 1959, the European Commission's Joint Research Centre (JRC) was created with the specific role of fostering joint European research in nuclear energy related matters. Since then there was much technical collaboration between the JRC and the IAEA in the field of Nuclear Safeguards.

The European Commission joined IAEA Member States Support Programme – MSSP, on the 7^{th} of May 1981 with an exchange of Letters establishing a "*formal Cooperative Support Programme between the IAEA and EURATOM in the field of Research and Development in Safeguards*". The exchanged letters indicated that *"… the programme will cover the following areas of R&D activity*": (i) Surveillance and containment; (ii) Measurement technology; (iii) Training Courses and (iv) Information data, treatment and evaluations

3. EC-SP Modes of Operation

The European Commission's Joint Research Centre (JRC) operates the EC-SP. Two JRC institutes actively collaborate with the IAEA under the framework of EC-SP: (a) Institute for Reference Materials and Measurements (IRMM), Geel, Belgium and (b) Institute for Transuranium Elements (ITU), Karlsruhe (Germany) and Ispra (Italy) sites

The European Commission Directorate General for Energy – ENER, in charge of the implementation of the EURATOM Treaty, follows up closely the progress of EC-SP tasks. Whenever appropriate, ENER engages into bilateral or multilateral collaboration schemes for executing specific EC-SP tasks.

3.1 Research and Development Tasks

The different meetings between EC and IAEA staff contribute to a widespread dissemination of knowledge and lead to specific Research, Development or Training tasks. EC and IAEA information exchanges bring together end-users and developers (i) EC staff becomes aware of IAEA needs and orientations; (ii) IAEA staff learns about recent R&D results, laboratories and equipment. The understanding of IAEA needs can influence JRC's R&D multi-annual work programme in the field of Nuclear Safeguards.

3.2 Expert Meetings and Workshops

JRC and ENER staff regularly participate to meetings, expert networks, workshops, etc. organised by the IAEA. These meetings contribute to a better understanding of needs in specific areas and are beneficial in defining future R&D activities.

3.3 Analysis of Nuclear Materials and Environmental Particle Samples – NWAL

The support to IAEA also includes the analysis of nuclear materials, of environmental bulk and particle samples, and the provision of Reference and Quality Control materials. These activities are performed in JRC laboratories in the frame of IAEA's Network of Analytical Laboratories (NWAL).

3.4 Scientific and Technical Support to EC Services supporting the IAEA

When other European Commission services support the IAEA, as part of the European Union non-proliferation policy, the EC-SP is often called to provide scientific and technical assistance and closing the gap between financing authority and the end-user.

3.5 Cooperation with other Support Programmes

The EC-SP fosters the active collaboration and cooperation with other MSSPs. Collaborative activities normally take the formal form of joint tasks. Around 30% of EC-SP tasks are executed jointly or in close collaboration with other MSSPs.

Given the organisation and policies of the European Union, representatives of the ten European Union's MSSPs[1] are invited to participating at EC-SP Annual Review Meetings. This practice has been found useful both for the IAEA and for participating member states. Not only discussions are richer, but it is also an opportunity to better coordinate and focus efforts and initiatives.

[1] EU MSSPs: Belgium, Czech Republic, Finland, France, Germany, Hungary, the Netherlands, Spain, Sweden and the United Kingdom.

The EURATOM Community has an R&D agreement with the United States Dept. of Energy in the field of Nuclear Safeguards and Security. The US Support Programme is thus an actor in this framework. Results of R&D actions with impact in Nuclear Safeguards can be made available to the IAEA.

Further to the mentioned meetings, JRC researchers and ENER staff participate actively at all ESARDA Working Groups. The IAEA is also represented in the working groups. ESARDA working groups also contribute to the dissemination of the technical activities and cooperation between all MSSPs.

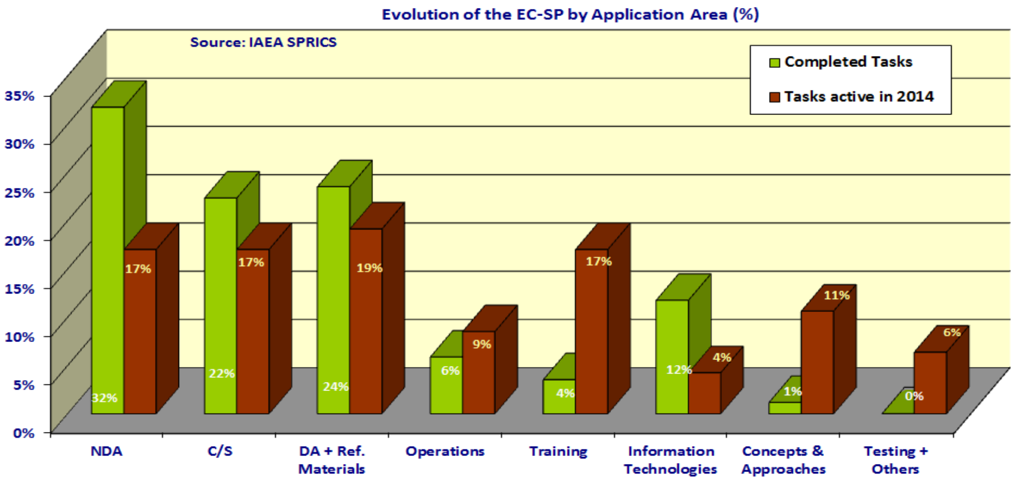
4. EC-SP Tasks

Since 1981, the EC-SP has been involved in 132 tasks. Table 1 shows the distribution of these tasks along the different Safeguards technical and application areas. Figure 1 shows the evolution of the EC-SP along the years as well as the number of active tasks since 1981.

NDA: Equipment, Modelling and Measurements	8
Sealing, Containment and Surveillance	8
Analytical and Reference Techniques	9
Support to Operations	4
Training	8
Information Technologies for Non- Proliferation	2
Concepts and Approaches	5
Others	3
Total	47

EC-SP tasks Distribution (Summer 2014)

Number of active EC-SP tasks since 1981



Distribution of EC-SP active and completed tasks.

5. Recent Highlights of the EC-SP

This section lists recent EC-SP task highlights, and illustrate how EC-SP developments can be close to inspectors' work and field measurements. Of particular importance is the fact that in recent years six JRC developments were approved for IAEA Safeguards use - also known as category A equipment.

5.1 Safeguards Equipment – Category A

5.1.1 COMPUCEA

COMPUCEA [Task EC-A-01507] (*Combined Procedure for Uranium Concentration and Enrichment Assay*) is used for on-site analytical measurements in support of joint EURATOM-IAEA inspections during physical inventory verification (PIV) campaigns in European LEU fuel fabrication plants [4,5].

The technique involves the accurate determination of the Uranium element content by energy-dispersive X-ray absorption edge spectrometry (L-edge densitometry) and of the 235U enrichment by gamma spectrometry with a LaBr3(Ce) detector. For evaluation of the LaBr3 spectra a modified version of the NaIGEM code is used, adapted to handle the presence of reprocessed Uranium.

New IAEA COMPUCEA instrument

The COMPUCEA technique is now used by the IAEA outside the European Union. Under Task EC-A-01507, a more user friendly software is being developed at the IAEA. This new software will be validated by JRC/ENER, aiming at the replacement of the current software, in both IAEA and JRC equipment. Recognizing the great benefit of COMPUCEA timely and accurate on-site verification measurements, the recently approved Task EC-A-2003 will extend the method to other uranium bulk handling facilities, such as conversion and enrichment plants.

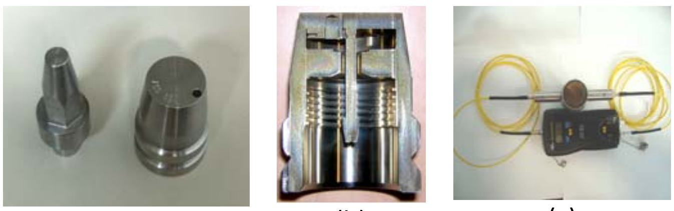
5.1.2 3DLR: 3D Laser Range Finder

3DLR was introduced in 2003 to support Design Information Verification (DIV) activities in large and complex nuclear facilities. 3DLR comprises: (1) a portable commercial off-the-shelf 3D laser range scanner and (2) a complementary 3D data processing software package: JRC-3DLVS. 3DLVS software capabilities include: (i) Viewing and managing acquired scans in-situ; (ii) Automatic combination of acquired scans for global 3D model; (iii) Automatic comparison of scans taken in the same location during subsequent DIV activities; (iv) Measurement of true distances and angles on the 3D view.

Recently, IAEA recognising the 3DLR is a powerful and flexible instrument with potential use in applications beyond DIV activities, requested the EC-SP to develop new applications, including geological repositories and site surveys of storage facilities [6] - Task EC-E-01993.

5.1.3 Ultrasonic Seals

In Task EC-E-01559 "*Update of the Ultrasonic Sealing Bolt*", JRC developed an ultrasonic seal used in different versions by both EURATOM and IAEA [7]. An ultrasonic seal uniquely identifies a nuclear container. Seal removal results in breaking a metal link leaving trace of the opening. Ultrasonic seals are suitable for applications in aggressive environment, as they are very robust, resistant to corrosion, pressure, heat and radiation. The fingerprint remains constant during the years.



(a) (b) (c)

Figure 5: (a) Two examples of ultrasonic seals; (b) seal vertical cut; (c) Ultrasonic seal with fiber optics

Following vulnerability assessment, JRC ultrasonic seals are now category A equipment, and used in nuclear installations in Canada, France, Lithuania, Pakistan, Romania, United Kingdom and, in a near future, Argentina. In recent years about 900 seals were installed in worldwide nuclear facilities.

5.1.4 L2IS: Laser Item Identification System

Task EC-E-1696 "*L2IS: Laser Item Identification System*" aims at real-time tracking of flow of drums in an enrichment plant, including identification and authentication [8]. L2IS monitors all transfers of UF6 drums between process areas by uniquely identifying each drum through the 3D microstructure of each drum's surface. The unique 'fingerprint' of a drum remains stable even under various environmental conditions. The L2IS system is composed of (a) a portable unit, operated in attended mode, and (b) a fixed, unattended unit. First, an inspector uses the portable unit to acquire the fingerprints of a given set of feed drums intended to be used over the forthcoming months. The fixed system monitors the flow of previously identified drums in a transfer corridor. The integration of data from the L2IS with data from other sensing devices is foreseen. This provides a high deterrence of diversion or substitution, and an increased probability of detection thereof. After extensive field testing and vulnerability assessment, the L2IS system was approved for Safeguards use in 2012.

5.1.5 UOSB: Ultra-Sonic Optical Sealing Bolt

A new ultrasonic seal combined with fiber optics was recently developed. It will be applied on Constor and Castor dry storage casks. This new seal has a double security: the ultrasonic ID of the seal (see Section 5.1.2) and the continuous verification of the integrity of an optical fiber.

(a) (b) (c)

Figure 6: (a,b) UOSB Infield test at Ignalina; (c) Reading system.

After a successful field test, UOSB, the Ultrasonic Optical Sealing Bolt, was authorised as category A equipment in September 2014. First implementation will be in Ignalina (Lithuania) end of 2014.

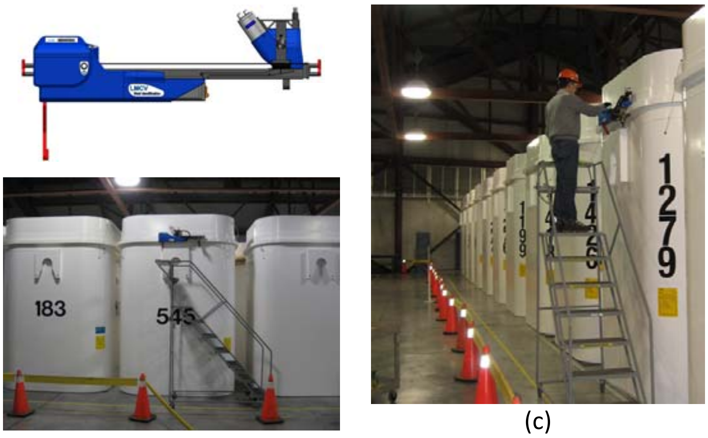
5.1.6 LMCV: 3D Laser Surface Mapping of Canister Closure Welds

JRC, under task EC-E-1549 – *3D Laser Surface Mapping of Canister Closure Welds*, developed LMCV: a portable laser range imaging system capable of identifying welds, a by-product of container physical sealing, with micron accuracy. It is based on the assumption that each weld has a unique 3D structure which cannot be copied or forged.

The 3D surface is processed to generate a normalized depth map which is invariant to mechanical alignment errors. This depth map is used to build compact signatures representing the welds. A weld signature is identified performing cross correlations against a set of known signatures. The system has been tested on realistic datasets containing hundreds of welds with almost 100% accuracy showing the robustness of the system and the validity of the chosen signature.

(a)

(b)



(c)

Figure XX: *(a) The LMCV device; (b) Device applied in a cask, and (c) Inspector performing weld verification.*

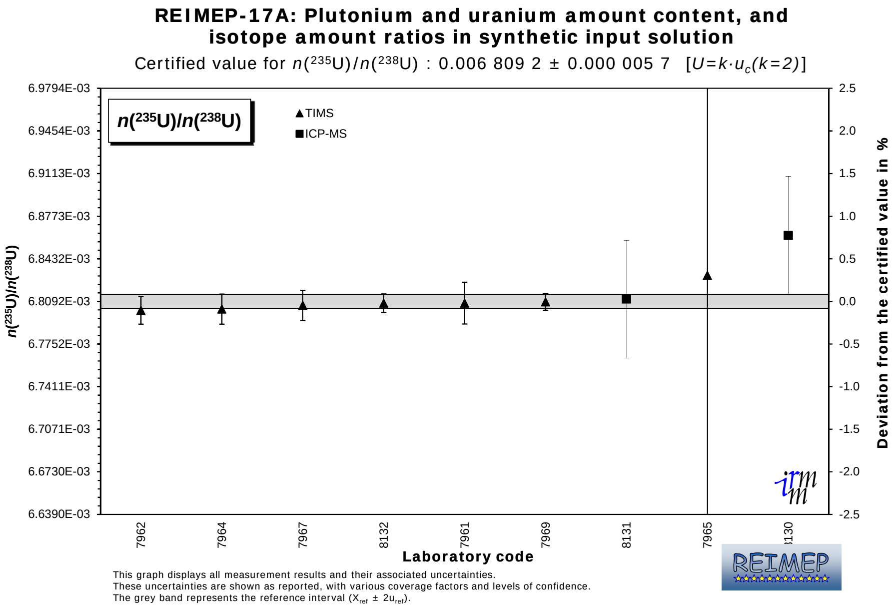
5.2 Reference Materials and Analytical Equipment

5.2.1 Reference Materials

Task EC-A-00318 – *Special Reference and Source Materials for Destructive Analysis*, one of the first EC support tasks to the IAEA is still ongoing today. JRC-IRMM certified reference materials continue to be regularly applied by IAEA's Office for Safeguards Analytical Service. Recently new certificates for a set of eleven UF6 reference materials, the IRMM-019 to IRMM-029 series, were issued. They are designed for use on gas source mass spectrometers and will greatly improve the ability to calibrate and perform quality control on the abundances of the minor isotopes in UF6 gas samples. Furthermore, JRC (IRMM and ITU) developed a Certified Reference Material (IRMM-1000) for Uranium Age Dating, supporting the nuclear forensics, nuclear safeguards and nuclear security measurement communities in detecting and responding to illicit trafficking of nuclear material [9].

Another long lasting EC support task is EC-A-00267 – *Analytical Quality Control Services*, organising the REIMEP and NUSIMEP external quality control programmes. NUSIMEP-7, 8 and REIMEP-17 are recent Inter-laboratory Comparisons (ILCs) supporting both ENER and IAEA Network of Analytical laboratories [10,11].

Participation in the NUSIMEP/REIMEP ILCs enables NWALs to demonstrate their measurement capabilities on particle and bulk samples similar to inspector's environmental swipe samples, and on samples matching materials analysed routinely in the nuclear fuel cycle.



REIMEP-17 participants results for $n(^{235}U)/n(^{238}U)$

Prior to the release of IRMM-1000, early 2015, REIMEP-22 on "age determination" of a certified uranium test sample has been organised in cooperation with EC-JRC-ITU, the Nuclear Forensics International Technical Working Group (ITWG) and laboratories in the field. REIMEP-22 results were presented at the International Conference on Advances in Nuclear Forensics.

5.2.2 Large Geometry Secondary Ion Mass Spectrometry – LG-SIMS

Analysis of environmental particle samples is one of the best means to detect undeclared activities dealing with enrichment and processing of nuclear materials and is a corner stone in the implementation of IAEA's additional protocol. For many years JRC-ITU has been involved with the development of novel analysis techniques aimed at accurate and precise measurements, determining the isotopic composition of the particles selected. This is of utmost relevance for safeguards as particles' composition provides specific information about the source and, often, about the chemical/industrial processes used [12].

LG-SIMS room, class 1000 clean room level.

JRC-ITU recently acquired a Large Geometry Secondary Ion Mass Spectroscopy instrument – LG-SIMS (CAMECA IMS 1280-HR) with co-financing from ENER/EURATOM Safeguards. This instrument is the very same as the one that IAEA installed in their new environmental sample laboratories in Seibersdorf, Austria. LG-SIMS improves the performance in uranium particle analysis and combines high sensitivity and high mass resolution [13]. The instrument is now in routine operation for samples analysis from various customers, including ENER (EURATOM inspections) and IAEA. In parallel to the routine sample analysis, there is continuous work in enhancing and improving the method.

5.3 Open Source Information Collection

Acquisition and analysis of open source information plays an increasingly important role in IAEA's move towards safeguards implementation based on all safeguards relevant information known about a State. The growing volume of information requires technology and tools capable of effectively (i) collecting relevant information, (ii) filtering out "noise", (iii) organizing valuable information in a clear and accessible manner, and (iv) assessing its relevance.

In this context, Task EC-D-01880 developed tools to support IAEA's Division of Information Management (SGIM) in producing an internal daily news brief – SGIM Highlights, including the most pertinent news stories relevant to safeguards and non-proliferation. The process involves the review and selection of hundreds of articles from a wide array of specifically selected sources.

This task uses JRC's Europe Media Monitor (EMM) and NewsDesk applications [14]: EMM automatically collects and analyses news articles from a pre-defined list of websites, and NewsDesk allows an analyst to manually select the most relevant articles from the EMM stream for further processing. A dedicated EMM installation was created addressing the nuclear safeguards and security domain (Nuclear Security Media Monitor, NSMM). NSMM and NewsDesk were adapted to meeting IAEA specific needs. Early 2013, SGIM started using NSMM/NewsDesk for the daily monitoring of its 'web sources' (over 150 nuclear-related web sites that were previously monitored manually). NSMM/NewsDesk is used for selected parts of the production workflow of the SGIM Highlights. Following the positive experience in the daily monitoring, SGIM is currently evaluating how NSMM/NewsDesk can contribute to country-specific monitoring involving the monitoring of additional national sources and the generation of state-specific information.

5.4 Safeguards by Design and Guidelines

JRC and ENER, contributed to IAEA work on Safeguards by Design Since 2008. The work continued under task EC-C-01726, with contributions to the first document of the new IAEA Safeguards by Design Series [15]. The work provides State authorities, designers, equipment providers and prospective purchasers of future nuclear facilities with an outline of the IAEA's safeguards system and with design guidelines to facilitate the implementation and application of these safeguards.

In the second phase of the project IAEA started the development of facility specific documents. These documents will be produced with the support of Member States and EC and will be published by IAEA in the Nuclear Energy Series. ENER and JRC-Ispra jointly contributed to the first facility specific guidance document "International Safeguards in the Design of Nuclear Reactors" [16]. EC also provided support on other SbD guidance documents dealing with: Long Term Spent Fuel Management Facilities, Fuel Fabrication Plants, Conversion Plants, and Enrichment and Reprocessing plants.

In 2013, the EC-SP accepted Task JNT-C-01959 addressing IAEA Key Objective: "Development and implementation of innovative and effective concepts and approaches to continue to meet safeguards challenges". Within this task ENER assists the IAEA in developing guidance documents. Work progressed along two major topics: (A) Safeguards Implementation Practices related to Facilities, Sites and other Locations, and (B) Safeguards Implementation Practices related to Establishing and Maintaining a State or Regional Authority Responsible for Safeguards.

5.5 Equipment Development and Qualification

TASK EC-A-1362: "*Modelling Testing and Training for NDA and URM Equipment*", JRC supported IAEA in the design, prototype construction, testing and evaluation of an innovative neutron coincidence collar based on liquid scintillation (LS) technology (i.e., not requiring expensive He-3). Unlike the current system, the new collar detects fast neutrons and, thus, reduces uncertainties in neutron counting. JRC validated the Monte Carlo modelling of liquid scintillation detectors, an extensive computational activity for the optimisation of the collar design, contributed to the calibration of the single LS cell and supported the execution of the first experimental campaign and analysis of results.

In the framework of Tasks EC-A-860: “*Qualification Testing of New Safeguards Equipment*” and EC-A-1634 “*MSSP Umbrella Task: Support for Novel Technologies*” a hand held Raman spectrometer was extensively tested for its capability to identify uranium compounds and other chemicals related to the front end of the nuclear fuel cycle, eg, solvents, reagents or extractants. The IAEA and JRC-ITU agreed to host a technology demonstration workshop focusing on the analytical capabilities of hand-held equipment. Methodologies include mobile/portable variants of techniques such as X-ray fluorescence, laser induced breakdown spectroscopy, Fourier Transform Infrared-Spectrometry, optical emission spectrometry or Raman spectroscopy. The workshop includes equipment demonstration as well as measurements of uranium compounds and nonradioactive chemicals typically encountered during nuclear fuel cycle activities.

5.6 Process Monitoring for GCEP Safeguards

Task JNT-A-01879 addresses the Safeguards of the new George Besse II gas centrifuged enrichment plant (GCEP) in France. EURATOM Safeguards commissioned a system able to store data from all operator weighing systems and load cells equipping all the feed and withdrawal stations of the different modules of the plant. The operator systematically and automatically provides the analysis data from the online mass spectrometers for the automatic calculation of the U-235 mass balance.

JRC developed several tools to retrieve the relevant information for the inspectorates conducting the Physical Inventory Verification (PIV). These tools were implemented in agreement with EURATOM Safeguards, IAEA and the operator. The tools (a) provide the status of all the stations, (b) display filling/emptying curves, (c) record and display information from “*t-24h*” until “*t+24h*”, (d) list the drums which went through accountancy weighing systems with identity, gross and net weights, and indication if a drum appears several times during the selected period, and (e) displays the ‘circuit’ followed by a specific drum. The tools allow PIV activities to be performed with no drum switch over.

This task aims also at developing tools to analyse data in near real time: mass balance, continuous survey of slopes of the different material flows, Cumulative Sum of residuals, etc. It is also expected to get the on-line mass spectrometry measurements and calculate mass balances and flows.

5.7 Unattended Cylinder Verification Station (UCVS) for Enrichment Plant Safeguards

Within the context of the US-DoE EURATOM agreement, Action Sheet 40 (AS40) aims at furthering the development of new UF6 cylinder verification instruments. A complex field test was carried out with participation of EURATOM safeguards, LANL, and PNNL and excellent cooperation by URENCO at their enrichment plant in Almelo [17]. Given the successful work in AS40, the IAEA requested US-SP and EC SPs to continue this development aiming at a system ready for inspection use. This is the topic of Task JNT-A-01979. This task illustrates how EURATOM safeguards cooperates with other partners and contributes to global safeguards development.

5.8 Training

Training keeps IAEA staff abreast of the new developments as well as increasing the effectiveness and efficiency of Safeguards implementation. Since 2007 ENER and the IAEA entered a reinforced cooperation for inspectors' training. Within this agreement, common needs were identified, and joint activities are organised, including the wide exchange of relevant technical information.

Tasks EC-B-00620 – "*NM Solution Accountancy and Verification Training*" or EC-B-01844 – "*Training of Safeguards Inspectors 3DLR (3D Laser Range Finder*", regularly organise courses with a multi-annual approved syllabus. Due to the high specificity of instruments and methods, Task EC-B-01752 "Training on Mass Spectrometry and Other Analytical Techniques", instead, targets dedicated individual training, normally by means of hosting trainees at JRC laboratories at IRMM or ITU.

Since 2012, Task EC-B1563 : "*Workshop on Additional Protocol Activities*" organises a special training course on Complementary Access (CA) for IAEA Safeguards at JRC-ITU, Karlsruhe, using the large number of unique and specialised facilities available. IAEA trainees are "exposed" to a complex and advanced nuclear R&D environment – a key challenge for IAEA safeguards in evaluating a State nuclear capability. Scenarios aim at enhancing trainees' abilities in using CAs to identifying possible indicators and signatures of activities in the area of advanced R&D technologies.

6. Discussion and Conclusions

JRC's experience in operating the European Commission Support Programme, in line with the continuous collaboration with ENER, has been very positive. The franc and regular dialogue with the IAEA led to a programme of applied research targeted to Nuclear Safeguards applications. This programme has produced and transferred several instruments with relevance to International Safeguards stakeholders.

In the last ten years, EC-SP contributions expanded beyond Nuclear Safeguards basic disciplines and entered new areas such as (a) direct support to IAEA operations, (b) training and (c) studies on Concepts and Methodologies for Safeguards implementation. The increased participation of ENER in the EC-SP addresses field evaluation of equipment, production of Safeguards implementation guidelines as well as evaluation studies on the potential use of new instruments and techniques.

The EC-SP is in line with the new orientation of the IAEA in having safeguards implementation based on all Safeguards relevant information known about a State. Indeed, in recent years there have been a few new tasks paving the way and exploring ways to acquire, process, analyse and integrate multi-lingual, multi-source, multi-timeframe information, including trade data.

In what concerns training, the JRC makes available its installations, laboratories, materials, expertise and know-how to the IAEA. Following 2007 ENER-IAEA reinforced cooperation for inspectors' training, common needs for training were identified and joint training actions regularly organised.

AS3ML – *Advanced Safeguards Measurement, Monitoring and Modelling Laboratory* [18], a new laboratory at JRC, Ispra site, will demonstrate and simulate monitoring techniques to automatically control nuclear activities in facilities such as reprocessing, as well as tracking processed nuclear materials. AS3ML will be used for testing and simulating Safeguards approaches as well as for associated training activities including the integration of Safeguards equipment and troubleshooting.

The existence of a Support Programme creates, somehow, a sense of partial ownership in what concerns the implementation of International Safeguards. This makes politicians and decision makers better informed about IAEA Safeguards, the legal framework, modes of operation and technical requirements. This is specifically true for all the scientific and technical staff working in JRC laboratories who feel most gratified when they know that their work has successfully contributed to the continuous challenge in "raising the bar" in both Safeguards and Non-Proliferation issues.

The European Commission Cooperative Support Programme is proud for all its past activities and achievements. The EC-SP wishes that future activities are as successful and looks forward to increasing cooperation with the IAEA and other Member States Support Programmes.

7. Acknowledgments

The authors express their gratitude to all colleagues in ENER and JRC for their collaboration in the smooth EC-SP implementation. In particular, a special word for task officers and other S&T staff who play the important role of executing the tasks, as well as for having provided material for this paper. The authors also acknowledge IAEA's Support Programme Coordination team for the excellent relations and good discussions aimed at the continuous improvement and efficiency of the EC-SP.

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