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Sixty-sixth regular session

STRENGTHENING THE EFFECTIVENESS AND IMPROVING THE EFFICIENCY OF AGENCY SAFEGUARDS

Report by the Director General

General Conference

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Strengthening the Effectiveness and Improving the Efficiency of Agency Safeguards

Report by the Director General

A. Introduction

1. The General Conference, in resolution GC(65)/RES/12 entitled ‘Strengthening the Effectiveness and Improving the Efficiency of Agency Safeguards’, requested the Director General to report on the implementation of the resolution to the General Conference at its 66th regular session. This report responds to that request and updates the information in last year’s report to the General Conference (document GC(65)/16).¹

¹ This report covers the period between 1 July 2021 and 30 June 2022.

B. Safeguards Agreements and Additional Protocols

B.1. Conclusion and Entry into Force of Safeguards Agreements and Additional Protocols²

2. Between 1 July 2021 and 30 June 2022, a comprehensive safeguards agreement (CSA) with a small quantities protocol (SQP) based on the revised standard text and an additional protocol (AP) entered into force for one State.³ Furthermore, a CSA with an SQP based on the revised standard text entered into force for one State.⁴ An AP entered into force for one State.⁵ SQPs based on the original standard text were amended for three States,⁶ in keeping with the Board of Governors' decision of September 2005 regarding such protocols. In addition, the SQPs were rescinded for three States.⁷ As of 30 June 2022, 72 States⁸ had an operative SQP in force based on the revised standard text, and 25 States⁹ had an operative SQP in force based on the original standard text.

3. As of 30 June 2022, 187 States¹⁰ had safeguards agreements in force with the Agency, 139 of which (including 133 States with CSAs) also had an AP in force. Forty-eight States had yet to bring into force APs to their safeguards agreements.

4. Seven States Party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)^{11, 12} have yet to bring CSAs into force pursuant to Article III of the Treaty.

5. The latest status of safeguards agreements and APs is published on the Agency's website.¹³

As of 30 June 2022,

187 States¹⁰
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² GC(65)/RES/12, OP 16.

³ Guinea-Bissau.

⁴ The Federated States of Micronesia.

⁵ Zimbabwe.

⁶ Brunei Darussalam, Lao People's Democratic Republic and Saint Lucia.

⁷ Lithuania, Malta and the United Arab Emirates

⁸ This number does not include two operative SQPs reproduced in INFCIRC/718/Mod.1 and INFCIRC/366/Mod.1, respectively.

⁹ This number does not include one operative SQP reproduced in INFCIRC/229.

¹⁰ And Taiwan, China.

¹¹ The designations employed and the presentation of material in this section, including the numbers cited, do not imply the expression of any opinion whatsoever on the part of the Agency or its Member States concerning the legal status of any country or territory or of its authorities, or concerning the delimitation of its frontiers.

¹² The referenced number of States Party to the NPT is based on the number of instruments of ratification, accession or succession that have been deposited.

¹³ <https://www.iaea.org/sites/default/files/20/01/sg-agreements-comprehensive-status.pdf>.

Between 1 July 2021 and 30 June 2022, SQPs based on the original standard text were amended for

3 States⁶

As of 30 June 2022,

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had an operative SQP in force based on the revised standard text, and

25 States⁹

had an operative SQP in force based on the original standard text.



B.2. Promotion and Assistance in the Conclusion of Safeguards Agreements and Additional Protocols¹⁴

6. The Agency has continued to implement elements of the plan of action outlined in resolution GC(44)/RES/19 and in the Agency's updated *Plan of Action to Promote the Conclusion of Safeguards Agreements and Additional Protocols*.¹⁵ Among the elements of the plan of action proposed in resolution GC(44)/RES/19 are:

- Intensified efforts by the Director General to conclude safeguards agreements and APs, especially with those States having substantial nuclear activities under their jurisdiction;
- Assistance by the Agency and Member States to other States by providing the knowledge and technical expertise necessary to conclude and implement safeguards agreements and APs; and
- Reinforced coordination between Member States and the Secretariat in their efforts to promote the conclusion of safeguards agreements and APs.

7. Pursuant to the guidance of the Policy-Making Organs and the Agency's updated plan of action, the Agency has continued to encourage and facilitate wider adherence to safeguards agreements and APs, and amendment and rescission of SQPs. During the reporting period, the Agency organized a national event with the Lao People's Democratic Republic (27-28 June 2022) and an online event with Samoa (10 March 2022). The Agency also held consultations with representatives from a number of Member and non-Member States in Geneva, New York and Vienna.

C. Implementation of Safeguards

C.1. Developing and Implementing State-Level Safeguards Approaches

8. General Conference resolution GC(65)/RES/12, inter alia, welcomed the clarifications and additional information provided in the *Supplementary Document to the Report on The Conceptualization and Development of Safeguards Implementation at the State Level (GOV/2013/38)* (document GOV/2014/41 and Corr. 1) (Supplementary Document) and noted the Secretariat's intention to keep the Board of Governors informed of progress made in the development and implementation of safeguards in the context of the State-level concept.

¹⁴ GC(65)/RES/12, OP 17.

¹⁵ The plan of action is available on the Agency's website at: <https://www.iaea.org/sites/default/files/21/09/sg-plan-of-action-2020-2021.pdf>

9. The Agency has progressively developed and implemented SLAs as set out in the Supplementary Document. The development and implementation of an SLA for a State enables the Agency to better focus the Agency's verification efforts on the relevant safeguards objectives for that State.

10. To further ensure consistency and non-discrimination in the implementation of SLAs, the Agency has continued to improve internal work practices taking into account experience gained and lessons learned in the development and implementation of SLAs for States under integrated safeguards. These updates to the SLA development process improve the link between the planning and implementation of safeguards activities and the State evaluation process, and they increase consistency in the development of SLAs for States with a broader safeguards conclusion.

11. The Agency continued its efforts focussing on refining its internal methodology for conducting acquisition path analyses and developing SLAs. During the reporting period, key elements of the methodology were further optimized and standardized, including the assessment of State nuclear fuel cycle capabilities, the selection of technical objectives, and the determination of the frequency and intensity of safeguards activities from performance targets. The Department also enhanced its Information Technology (IT) tools used in the development of acquisition path analyses and SLAs, and updated the related procedures and guidance.

12. Based on the refined methodology, the Agency continued to update SLAs for States with a broader safeguards conclusion. The project has been extended to include further testing of the updated procedures, and the enhancement of IT tools to assist in both safeguards planning and effectiveness evaluation.¹⁶

13. The total number of States with a CSA in force for which an SLA has been developed stands at 133. These 133 States hold 97% of all nuclear material (by significant quantity) under Agency safeguards in States with a CSA in force. These 133 States are comprised of 70 States with a CSA and an AP in force for which the broader conclusion has been drawn for 2021 (of which 17 are States with an SQP); 37 States with a CSA and an AP in force for which the broader safeguards conclusion was not drawn for 2021 (of which 26 are States with an SQP); and 26 States with a CSA with an SQP in force but no AP in force. In addition, there are two States with a voluntary offer agreement and an AP in force for which an SLA has been developed. As described in the Supplementary Document, in developing and implementing an SLA, consultations were held with the relevant State and/or regional authority, particularly on the implementation of in-field safeguards measures.

C.2. Dialogue with States on Safeguards Matters

14. The Secretariat has continued to engage in open and active dialogue with States on safeguards matters during the reporting period:

- Held a technical meeting focused on improving consistency in the implementation of State-level safeguards approaches;
- Presented the work of the Department to the seminar 'Introduction to the IAEA: A Seminar for Diplomats' and to the United Nations Disarmament Fellows in October;
- Held a four-part webinar series on Agency safeguards for new delegates in Vienna-based Permanent Missions, and a webinar on Agency safeguards for Geneva and New York-based delegates ahead of the 10th NPT Review Conference;

¹⁶ GC(65)/RES/12, OP 27, 28 and 30.

- Prepared a background report for the 10th NPT Review Conference on Agency activities relevant to Article III of the NPT;
- Organized five hybrid (on-line and in-person) side events on the margins of the 65th IAEA General Conference. Topics included the IAEA Comprehensive Capacity-Building Initiative for SSACs and SRAs (COMPASS), safeguards approaches at small modular reactors, the State Declarations Portal (SDP), environmental sampling, and the safeguards activities of Agency inspectors;
- Organized three tours of the IAEA Safeguards laboratories at the Vienna International Centre on the margins of the 65th IAEA General Conference.
- Organized 20 tours of the SAL in Seibersdorf, attended by over 170 diplomats and members of civil society, and six tours of the ERML at Agency Headquarters, attended by over 90 diplomats and members of civil society;
- Organized a side event ‘Promotion of and Assistance in the Conclusion of Safeguards Agreements and Additional Protocols and the Amendment or Rescission of Small Quantities Protocols’ on the margins of the IAEA’s First International Conference on Nuclear Law;
- Co-organized or presented at a number of nuclear safeguards and non-proliferation events sponsored by outside organizations;
- Participated in the International Conference on a ‘Decade of Progress after Fukushima-Daiichi’, and presented the Agency’s experience in ‘Performing Nuclear Safeguards at Fukushima’ at a side event;



An IAEA Nuclear Safeguards Inspector presents on ‘Performing Nuclear Safeguards at Fukushima’ at International Conference on a ‘Decade of Progress after Fukushima-Daiichi’. (Photo credit: IAEA)

- Continued to communicate with civil society through the Agency's website and social media channels. Web content encompassed subjects including the 50th anniversary of the entry into force of the first CSA, the establishment of the new Member State Support Programme (MSSP) between Switzerland and the Agency, safeguards approaches at small modular reactors, the use of environmental sampling in nuclear verification, the establishment of new partnerships between the Agency and Civil Society Organizations, the launch of a new webinar series on safeguards implementation, and aspects of the daily work of a safeguards inspectors.¹⁷

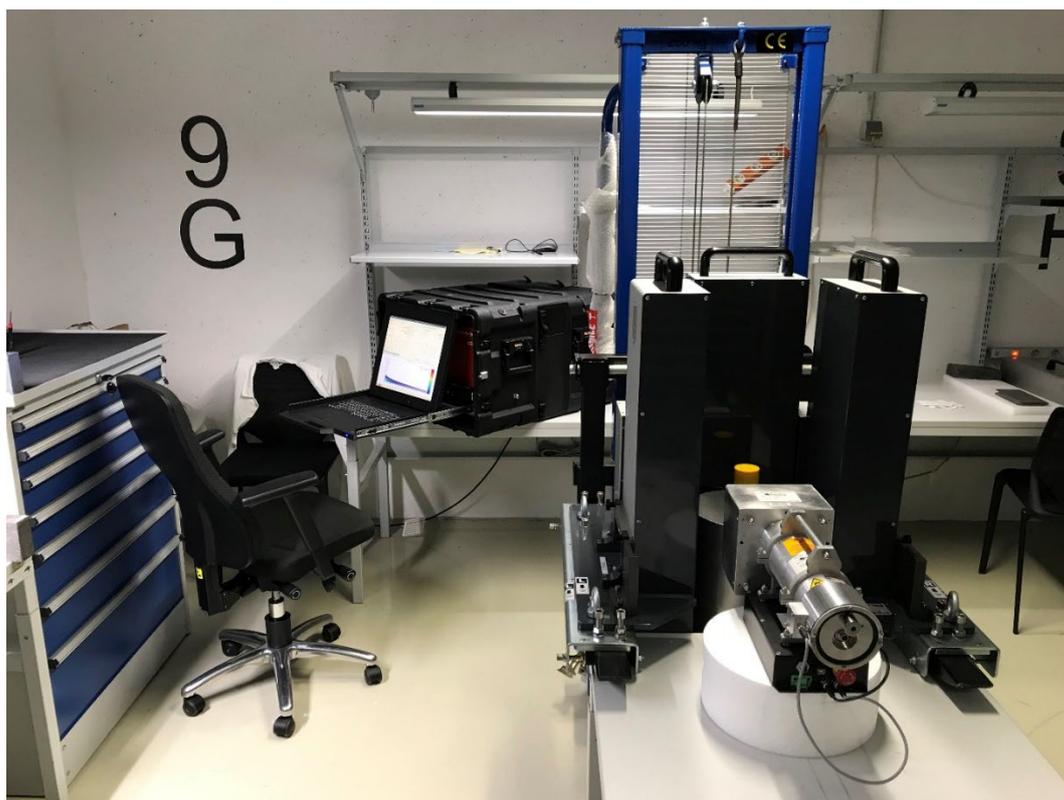
C.3. Strengthening Safeguards Implementation in the Field

15. The Agency has continued to seek improvements to the effectiveness and efficiency of safeguards implementation in the field. These improvements apply to all stages of the nuclear fuel cycle, and include advances related to both safeguards equipment and safeguards approaches.

16. Site- or facility-specific safeguards approaches/procedures were developed or updated in light of the changes in design information and/or operations of facilities for:

- The verification of the production of high enriched uranium at an enrichment plant in Iran;
- The verification of the conversion of low enriched uranium hexafluoride (UF₆) into uranium metal at a research and development (R&D) laboratory, and the subsequent manufacturing at a fuel fabrication plant of two single fuel plates destined to develop a new type of nuclear fuel for a research reactor in Iran;
- The verification of the conversion of high enriched UF₆ into U₃O₈, and the subsequent manufacturing at a fuel fabrication plant of uranium targets, destined for the production of radioisotopes in Iran;
- Safeguards approach for Shaanxi Uranium Enrichment Plant (SUEP) in China;
- The application of a dual containment and surveillance system at interim spent fuel dry storages in Argentina, India, Spain and Ukraine;
- The routine use of remote data transmission at light water reactors in the Netherlands;
- The verification of nuclear material and implementation of safeguards activities at the Fukushima Daiichi Site, and for R&D facilities and Locations Outside Facilities (LOFs) in Japan;
- The joint use of a fast neutron coincidence collar (FNCL) in the States of the European Atomic Energy Community;
- The short-notice verification of inventory changes at a uranium conversion and scrap recovery plant, and at a new pressurised water reactor (PWR) fuel fabrication plant in Kazakhstan;
- The verification of spent fuel transfers from three power reactor sites to a new centralized dry storage facility in Ukraine.

¹⁷ The webinar was placed on the Agency's learning management system and is available here: <https://elearning.iaea.org/m2/course/view.php?id=693>



The fast neutron coincidence collar (FNCL) during testing (Photo credit: IAEA staff)

17. The Agency continued to prepare, with Member States' support, for the future application of safeguards to new types of facility (e.g. pyroprocessing facilities, molten salt reactors, floating reactors, micro modular reactors and pebble bed modular reactors). These preparations included, evaluating safeguards concepts, investigating prospective safeguards technologies and equipment, and identifying safeguards measures and potential efficiencies through design modification early in the design stages of a facility. During the reporting period, the Agency's interdepartmental working group on safeguards by design continued to foster knowledge sharing and enhanced cooperation within the Agency on this subject. In addition, the Agency continued its early interaction with the Member States designing of small modular reactors, as part of several MSSPs tasks on 'safeguards by design'. The Agency created a contact email, SMR@iaea.org, to assist States in such early interaction.

18. Finland and Sweden each have plans to construct an encapsulation plant and a geological repository (EPGR) in which to dispose of spent fuel. The Agency's EPGR project coordinates the development of specific safeguards approaches for EPGRs and assesses verification methods. In order to optimize safeguards measures at the time EPGRs become operational, the project also identifies new equipment and techniques necessary for safeguarding these facilities.

19. Safeguards development and implementation activities at the Japan Mixed-Oxide Fuel Fabrication Plant continued to be limited due to ongoing construction delays. While the construction and commissioning of the plant is not expected to be completed before 2024, the Agency continued to update the planned safeguards systems necessary to meet the plant's safety requirements.

C.4. Information Technology

20. The Agency continued to enhance existing safeguards software and develop new software capabilities. The Department of Safeguards focused on improving the integration of software applications to reduce the time users are spending on manual data entry and enable also the import of data that is electronically available from member states and facility operators. The focus on improving the software learnability and usability, remains together with keeping key technologies in the information technology (IT) infrastructure up-to-date, to accommodate for recent technological advancements.

21. The Department implemented a new platform for the management of electronic documents covering the business need of a document repository within the departmental Quality Management System (QMS). The repository currently contains the latest approved versions of around 2200 procedures, policies, guides and other quality-controlled documents. In the future this platform will enable the implementation of efficient document workflows in order to reduce the administrative effort of tracking internal and external correspondence.

22. The State Declaration Portal (SDP) further developed towards the key communication channel with member states on all structured data exchanges now with more than 103 Member States actively submitting and 25 additional States currently being on-boarded. SDP supports secure two-way communication of currently more than eight submission types from Nuclear Material Accounting Reports over Additional Protocol Declarations to Operator declarations of General Ledgers.

23. The Technical Assistance Review System (TARS) was put into production beginning of 2022 providing analysts an easy-to-use tool to review the safeguards relevance of technical assistance activities of the IAEA to Member States. The system consolidates the information to be reviewed by analysts and implements an electronic workflow increasing the efficiency, quality and accuracy of the review process.

C.5. Information Analysis

24. The analysis of all safeguards relevant information available to the Agency is an essential part of evaluating a State's nuclear activities and drawing safeguards conclusions. In drawing its safeguards conclusions, the Agency analyses the consistency of State declarations and compares them with the results of Agency verification activities and other safeguards relevant information available to it. In support of this process, the Agency draws on information from verification activities performed in the field and at Headquarters, including the results from non-destructive assay (NDA), destructive analysis (DA), environmental sample analysis and data remotely transmitted by unattended equipment. The Agency also draws on a diverse range of other sources of safeguards relevant information, including commercial satellite imagery, science and technology literature, and trade information. The Agency continued to identify new safeguards relevant open sources of information, improve processes and enhance methodologies and tools.



IAEA Director General Rafael Mariano Grossi uses satellite imagery while briefing the international press and media upon his return from Ukraine, where he visited the Chornobyl Nuclear Power Plant, 28 April 2022 (Photo credit: Dean Calma / IAEA)

25. Material balance evaluation reports are prepared routinely by the Agency for all nuclear material bulk handling facilities with an inventory or throughput of more than one significant quantity of nuclear material. The objectives of material balance evaluations are to evaluate the consistency of State declarations with the result of the Agency's verification, through the processing, reconciliation and statistical analysis of NDA and DA measurements.

26. Taking advantage of technical advancements in commercial satellite imagery, the Agency was able to acquire more extensive, timely and historical images from online catalogues of satellite imagery providers. Images of a higher resolution were acquired, and with better timeliness, to improve the quality of satellite imagery analysis and increase its cost effectiveness.

27. Data on nuclear relevant trade from public and internal sources was used to assess the consistency and completeness of nuclear activities declared by States to the Agency.

C.6. Analytical Services

28. Environmental and nuclear material samples collected by safeguards inspectors are analysed by the Agency's Safeguards Analytical Laboratory (SAL) in Seibersdorf, Austria – consisting of the Nuclear Material Laboratory (NML) and the Environmental Sample Laboratory (ESL) – and by other laboratories within the Agency's Network of Analytical Laboratories (NWAL). The NWAL includes 24 qualified laboratories located in Australia, Brazil, China, France, Germany, Hungary, Japan, the Republic of Korea, the Russian Federation, the United Kingdom, the United States of America and the European Commission. In addition, the Agency operates the On-Site Laboratory (OSL) in Rokkasho, Japan, for the analysis of nuclear material samples collected at this site.

29. The Agency also provides logistical support for the collection, transport and analysis of nuclear material and environmental samples. Key performance indicators are used to monitor all stages of this process in order to identify potential problems and make improvements in timeliness. Moreover, the

Agency administers a rigorous quality control programme, which includes regular inter-laboratory comparison exercises covering the major analytical techniques relevant to safeguards, to confirm the quality of analytical results across the NWAL.

30. The Agency continued work on a project aimed at the procurement, commissioning and calibration of a new Large Geometry Secondary Ion Mass Spectrometer (LG-SIMS) to replace the existing LG-SIMS and sustain particle analysis capabilities for uranium isotopes. This project, which is critical for the Agency to be able to continue to fulfil its verification responsibilities, has been entirely funded through extrabudgetary contributions provided by several Member States.



*The new Large Geometry Secondary Ion Mass Spectrometer (LG-SIMS)
(Photo credit: IAEA staff)*

C.7. Equipment and Technology

31. The Agency provided uninterrupted scientific and technical support for verification activities. Overall, the Agency delivered equipment for safeguards activities in the field to a level comparable with that achieved in pre-pandemic times. All departmental requests for safeguards equipment and personal protective equipment (PPE) for use during safeguards activities in the field were processed.

32. During the reporting period, the reliability of digital surveillance systems, NDA systems, unattended monitoring systems and electronic seals exceeded the target goal of 99% availability. Despite the travel restrictions due to the COVID-19 pandemic, which significantly impacted scheduled maintenance activities, the Agency succeeded in conducting technical activities in the field to the level necessary to guarantee the desired performance of the installed equipment.

33. The Equipment Radiation Monitoring Laboratory (ERML) provided uninterrupted radiation monitoring of items returned from verification activities in the field, including components of safeguards systems, seals, and environmental samples. During the reporting period, the ERML monitored 32 325 items for surface contamination.

34. The effort spent to install, maintain and support the use of equipment in the field required 1921 days of in-field work, plus associated travel days and days related to quarantine or other travel

restrictions. Of these days in the field, 275 days were dedicated to safeguards activities, including 149 person-days of inspection (PDIs) accumulated by safeguards technical experts designated to conduct inspection work

35. State or Regional Authority responsible for safeguards implementation (SRAs) continued to support the Agency by providing resources and solutions in the area of system design, data security and maintenance of safeguards equipment, including equipment authorized for joint use. During the reporting period, support provided by SRAs included:

- The provision of surveillance cameras and associated hardware for installation and maintenance of joint-use safeguards equipment;
- The development of software for the review and the analysis of data collected in the field;
- The provision of infrastructure and design for the implementation of safeguards monitoring systems at the Fukushima-Daiichi site;
- The design of unattended monitoring systems (UMS) at new facilities, including the EPGR in Finland.

36. The contribution of MSSPs remained essential to address specific needs through collaboration in system development: expertise, provision of equipment, and access to facilities for equipment testing.

37. In December 2021, the Agency authorized the new Field Verifiable Passive Seal (FVPS) intended to replace the traditional metal seal (E-CAP) and will provide substantial improvements in the application and verification of passive seals.



New Field Verifiable Passive Seal (Photo credit: IAEA staff)

Between 1 July 2021 and 30 June 2022, the effort to install, maintain and support the use of equipment in the field required

1921 days

of in-field work, plus associated travel days and days related to quarantine or other travel restrictions.



C.8. Asset Management

38. At the end of June 2022, the Department of Safeguards had nearly 55 000 active items registered in the safeguards asset registry (SEQUOIA). These items cost the Department over €245 million and are deployed to support safeguards activities in over 73 States. Under the Integrated Lifecycle Management of Safeguards Assets (ILSA) project, the Department created an asset management strategy to provide guidance for, and ensure consistency in, managing the lifecycle of all safeguards assets, including IT equipment, safeguards equipment supporting in-field activities, laboratory equipment and software. The ILSA project led a review of the costs, operational lifetime, and other key parameters to improve the Agency's ability to plan for asset replacements. This review was coordinated with over 20 staff throughout the Agency, each overseeing a specific type of safeguards asset. It focused on those assets or asset groups that cost the Agency more than €150 000 and which are expected to be replaced by the end of 2026, or labelled as high risk.

39. As reported in the *Safeguards Implementation Report (SIR) for 2021* (GOV/2022/25) the current health of the Department of Safeguards' asset base could be maintained if historical funding levels continue — including both regular and extrabudgetary contributions — for the next 15 years. Large variations in inflation rates as experienced over the last months may have an impact of this assessment.

40. During the year the Department began a set of in-depth explorations, and performed a quantitative risk analysis of the full lifecycle resource requirements and usage for a set of the Department's most critical and costly assets. Namely, these are the replacement of the portable gamma spectroscopy equipment, surveillance cameras, IT hardware, internally developed software supporting verification, and mass spectrometers. For each asset class, the Agency is estimating the costs over the full lifetime of the asset including estimates for the purchase, normal operation, maintenance, and cost to the Agency should the asset fail. These reviews will help the Agency develop more detailed financial projections for maintaining the safeguards asset base, and communicate more effectively about its financial requirements for safeguards assets.

C.9. Evaluation of the Effectiveness of Safeguards Implementation

41. Effectiveness evaluation is a process involving every step of safeguards implementation. It is conducted in order to assess the extent to which safeguards objectives were attained by verification activities conducted in the field and at Headquarters. Effectiveness evaluation of safeguards implementation is based on internal documents, such as the approved safeguards approaches and other related safeguards documentation, which are periodically reviewed and, if necessary, updated by departmental committees and safeguards evaluators.

42. Internal evaluation of the effectiveness of safeguards implementation was performed through peer reviews of Annual Implementation Plans (AIPs) and State evaluation reports. The AIPs approved at the beginning of the year are regularly reviewed throughout the year to assure that safeguards activities conducted in the field and at Headquarters are planned to a level sufficient to achieve the safeguards

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These items cost the Department over

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73 States

objectives. Following the conducting of planned safeguards activities, the AIPs are again reviewed to ensure that these activities were conducted successfully and, whenever safeguards implementation issues were encountered, actions related to their resolution were properly taken.

43. State evaluation reports are regularly reviewed by inter-departmental committees. As an additional review mechanism, every year, ad hoc departmental teams are appointed by the Deputy Director General and Head of the Department of Safeguards to peer review the State evaluation for a selected number of States.

44. Results from effectiveness evaluation activities are recorded and reported to senior management within the Department to identify good practices and areas for improvement, and to highlight recommended actions. Effectiveness evaluation further strengthens the effectiveness of safeguards implementation, and increases the level of consistency and standardization across the Department.

C.10. Cooperation with, and assistance to, SRAs

45. The effectiveness and efficiency of Agency safeguards depend, to a large extent, on the effectiveness of State systems of accounting for and control of nuclear material (SSACs), regional systems of accounting for and control of nuclear material (RSACs) and on the level of cooperation between SRAs and the Agency.

C. 10.1. Comprehensive Capacity Building Initiative for SSACs and SRAs (COMPASS)

46. The Agency began to implement COMPASS in the seven States¹⁸ that were invited by the Agency to join the initiative for its two-year pilot phase. COMPASS, which was launched in 2020, continued to further support States in their efforts to strengthen and sustain the effectiveness of their SRA and respective SSAC, and thus address related areas of difficulty in safeguards implementation.

47. During the reporting period, a wide range of activities were conducted with the pilot States as per their respective workplans. Two outreach webinars, as well as a number of training events, were held with national decision-makers to raise awareness about safeguards. Additionally, radionuclide identification devices and laptops were procured by the Agency to help pilot States enhance their technical capacity to implement safeguards. Legal and regulatory support was also provided to help States strengthen their safeguards-related legislation and regulatory framework. In order to give ready access to the references, learning materials and training available through COMPASS, web pages were created in 2021 for each pilot State on CLP4NET, the learning management system of the Agency.

¹⁸ Guatemala, Jordan, Malaysia, Rwanda, Saudi Arabia, Türkiye and Uzbekistan.



Participants of a COMPASS activity training in Guatemala are shown how to use an IdentiFINDER R400, a hand-held, low-resolution, gamma-ray spectrometer (Photo credit: IAEA staff)

Between 1 July 2021 and 30
June 2022,
the Agency has held

35

training events - in-person
and virtual

Involving 75 Countries
and 440 Participants

5

Topical Webinars

Involving 103 Countries and
1500 Participants



48. Thirteen MSSPs and other supporting States have agreed to provide financial and/or in-kind contributions to COMPASS. In-kind contributions allowed for direct consultations between experts from supporting States and pilot States' representatives to share experience and best practices on different aspects of safeguards implementation. This was mainly done through online meetings and workshops moderated by the COMPASS team, as well as scientific visits to supporting States. One of the tasks covered by such consultations was the review of guidelines and procedures for safeguards implementation developed by each pilot State.

49. The Agency continues to work with all seven pilot States to implement the assistance packages agreed with the States, whilst monitoring and assessing project progress in close cooperation with each State involved.

C.10.2. Strengthening the effectiveness of SRAs and SSACs

50. The Agency provides the International Safeguards and SSAC Advisory Service (ISSAS) to States, at their request, with advice and recommendations on the establishment and strengthening of SSACs. The Agency conducted one ISSAS mission for Bangladesh during this reporting period.

51. The Agency conducted 35 training events for personnel responsible for overseeing and implementing SSACs and RSACs. These events represent a combination of in-person and virtual training courses, as well as scientific visits. In total, more than 440 experts from 75 States were trained on safeguards-related topics.

52. The Agency launched a series of interactive webinars aimed at enhancing national authorities' understanding of their IAEA safeguards obligations, and supporting effective and efficient safeguards

implementation. Five webinars were conducted, covering topics such as Strengthening the SSAC, AP Reporting, LOF Outreach and ISSAS Missions. With an average of 190 participants for each session, over 1500 participants representing 103 States have participated.

53. Nine young professionals (including five women) from Angola, Indonesia, Jordan, Malaysia, Saudi Arabia, Senegal, Sri Lanka, Tunisia and the United Arab Emirates completed the IAEA Safeguards Traineeship Programme for Young Graduates and Junior Professionals in November 2021. Through this Traineeship Programme, the Agency provides development opportunities designed to enhance the technical skills and competence of the trainees regarding the implementation of safeguards. This training also broadens trainees' knowledge of the peaceful applications of nuclear techniques and the implementation thereof in their respective States.

54. The 23rd Safeguards Traineeship Programme commenced in February 2022 with nine participants (including five women) from Algeria, Cameroon, Costa Rica, Guyana, Nigeria, Panama, Tajikistan, Tanzania and Yemen.

55. In order to make training material accessible on demand for Member States, the Agency updated the Safeguards section on CLP4NET. CLP4NET was visited by more than 600 new users in the reporting period.

56. Additionally, the Agency developed new training modules on topics such as nuclear trade, design information, using the IdentifINDER, nuclear material accountancy (English and Spanish), ISSAS missions, Protocol Reporter 3 as well as a new library of learning videos. With approximately 1900 registrations, an interactive webinar series covered six SSAC-related topics and the recordings were made available together with supporting material on CLP4NET.

C.10.3. Other initiatives enhancing cooperation with State and regional authorities

57. The Agency continued discussions with the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) and the European Commission aimed at strengthening cooperation and enhancing the effectiveness and efficiency of safeguards implementation in the relevant States. The Agency continued to work with Japan to address the long-term verification challenges at the Fukushima Daiichi site.

58. The Agency provided lecturers and conducted table-top exercises to support training courses organized by Member States and the European Commission. The Agency participated in various webinars on safeguards implementation and preparing for in-field activities held by the United States of America.

59. The Agency contributed to the development and implementation of the European Nuclear Education Network (ENEN) Master's Program on Nuclear Safeguards through design, development and implementation of sessions on IAEA safeguards-related topics. This programme gives the opportunity to train and develop specific competencies in order to enhance the efficiency of employees, and support the continuous development of a professional, competent and motivated workforce, in the field of nuclear safeguards.

60. The Agency's Integrated Nuclear Infrastructure Review (INIR) missions are designed to assist Member States, at their request, in evaluating the status of their national infrastructure for the introduction of a nuclear power programme. INIR missions cover 19 infrastructure issues, of which one is safeguards, to be considered during the different stages of developing a nuclear power programme¹⁹.

¹⁹ For more information see the Agency publication *Milestones in the Development of a National Infrastructure for Nuclear Power*, IAEA Nuclear Energy Series, NG-G-3.1 (Rev.1) (2015).

During the reporting period, the Department of Safeguards participated in two INIR missions for nuclear power to Sri Lanka and Uganda, and one INIR mission for research reactors to Thailand.

61. The Agency also continued to expand and promote the State Declarations Portal (SDP), a web-based secure system that supports the communication exchange between the Agency and SRAs. By using the SDP, SRAs can provide the Agency with a wide variety of submissions, including nuclear material accountancy reports, AP declarations, and design information questionnaires (DIQs), as well as receive feedback communications from the Agency, all in a fast and secure way. Data security is a key feature of the SDP, which uses multiple reinforcing security layers to guarantee the confidentiality of communications. In addition, the SDP allows for better integration with other safeguard applications and for more efficient analysis of the data received. To increase institutional memory, the SDP also offers an electronic historical log of the communication exchanges between the Agency and SRAs. Online training material is available through the Agency's learning management system, CLP4NET.

C.11. Safeguards Workforce

62. As the knowledge and skills required of its workforce evolve, so does the Agency's training curriculum. The Department undertakes workforce planning and forecasting on a regular basis, both as part of the programme and budgeting process and as part of standard human resources activities.



IAEA staff perform video recordings of safeguards training for use online (Photo credit: IAEA staff)

63. The Agency continually updates its training curriculum to ensure that Agency staff are equipped with the necessary knowledge and skills to perform their role. Courses held at nuclear facilities are designed to enhance practical competencies for safeguards implementation in the field, with over 90 course offerings a year. These courses enable effective and integrated training of safeguards staff in a realistic environment. In particular, such training improves inspectors' ability to prepare for, conduct and report on inspections, design information verifications and complementary accesses. Other courses aim to develop skills for analysing safeguards relevant information using different techniques, including collaborative analysis tools.

64. Nine new inspectors completed the Introductory Courses for Agency Safeguards (ICAS) in 2021, and 12 new inspectors commenced ICAS in March 2022. The course integrates a virtual learning

component prior to the start of ICAS to provide new inspectors with the opportunity to become familiar with the Agency and the basics of safeguards at their own pace.

As of 30 June 2022,

38%

of all regular staff members in the Department were women.

Women represented

29%

of the staff in the Professional and higher categories,

28%

of the safeguards inspectors in the Divisions of Operations and the Office for Verification in Iran, and

28%

of positions at the Section Head level and above



65. Due to the continued COVID-19 pandemic, the Agency focused on determining and delivering high priority courses for staff, and developing learning opportunities. The Agency also focused on making these available remotely if required. This effort resulted in the re-design of the Complementary Access Roles and Responsibility Course and the Legal Basis Refresher training. The Agency launched a webinar series for Department of Safeguards' staff to provide greater access to learning opportunities on key topics and new developments. The Agency web platform for user documentation and learning resource provides on-the-job support and resources for a suite of safeguards IT applications.

66. The Agency worked with its MSSP partners to adapt courses to be delivered in a virtual mode. While this allowed for basic learning, and in certain cases complemented in-person training, it did not replace the need for facility-based training. The Agency, together with MSSPs, delivered the Export/Import Information Workshop and the Accelerators, Operations and Safeguards Workshop virtually. A new webinar, the Critical Thinking Seminar, was piloted as an introduction to critical thinking and analysis. With the crucial support of Member States and facilities, the Agency was able to implement selected high-priority courses for new inspectors and in the area of NDA techniques. Additionally, with this support, the Agency conducted a training needs analysis on industrial health and safety in order to provide the basis for a more structured and relevant safety training programme for the Department. The objective of the training is for the learners to be able to recognize industrial safety and health hazards, and be able to evaluate and mitigate risk to perform work safely.

67. The Agency has over 90 training-related MSSP tasks and continues to engage with MSSPs in the development of training methodologies, tools and conduct of courses both at IAEA Headquarters and at nuclear facilities.

68. In line with the Agency Gender Equality Policy and the Special Measures for the Achievement of Gender Parity, the Department of Safeguards is committed to supporting gender equality and is seeking to strengthen efforts to promote both gender parity in its staff and gender mainstreaming considerations in relevant programmatic activities.

69. As of 30 June 2022, 38% of all regular staff members in the Department were women. According to the gender scorecard analysis for the Department, women represented 29% of the staff in the Professional and higher categories. Women comprised 28% of the safeguards inspectors in the Divisions of Operations and the Office for Verification in Iran, and 28% of positions at the Section Head level and above.

70. The Department increased its activities to encourage women candidates in recruitment exercises, enhance outreach opportunities and ensure improved gender balance on recruitment panels.



An example of IAEA outreach, disseminated over social media, to encourage women candidates in recruitment exercises.

C.12. Quality Management

71. To ensure impartiality, effectiveness and efficiency of safeguards implementation, the quality management system (QMS) of the Department of Safeguards provides the means for conducting oversight of the key safeguards processes. As part of the QMS, the Department of Safeguards conducts internal quality audits and assessments to determine the performance and effectiveness of its processes. The Department continued to implement other quality management activities associated with condition reporting, root cause analysis, knowledge management, process improvement and document control.

C.13. Organizational Resilience

72. The Department's business continuity and disaster recovery plans played an essential role in guaranteeing continuous operations during the global restrictions imposed by the COVID-19 pandemic. Flexible and safe travel arrangements were established to ensure that safeguards activities in the field could continue without interruption, while providing the necessary care and protection for the health and well-being of the staff members. The measures adopted at the outset of the pandemic continued to be used and improved, ensuring activities in the field continued smoothly and that staff could perform their duties while maintaining a high level of information security.

73. The Department of Safeguards continued its efforts to ensure business continuity and disaster recovery to maintain the continuation of critical business processes and the availability of information during a disruptive event. During the year, the Department commenced with the implementation to replace the aging core IT Infrastructure for the headquarters and the regional offices with modern, more flexible technology. This effort will provide the foundation to establish disaster recovery capabilities at the Agency's premises in Seibersdorf. The implementation is planned in a phased approach over the period 2022–2024.

74. Safeguards information security continued to be a priority.²⁰ The Agency decided to assign accountability and responsibility for the security of the Department of Safeguards' information to the Deputy Director General and Head of the Department of Safeguards. This decision resulted in policy and organizational changes to more accurately reflect the responsibilities and align the resources with carrying out the information security, business continuity and physical security programmes.

75. The information security programme of the Department of Safeguards focused its activities on outcomes related to the reduction of risk from targeted cyber intrusion and protection from cybercrime activities. In addition, the Department continued to explore ways to enhance information protection while enabling information analysis as well as activities in the field. The strategies employed focused heavily on a layered defense in depth security model, as well as removing vulnerabilities from the Department's information systems. To this end, the Department conducts a regular programme of discovery, identification and remediation of vulnerabilities in its information systems and software products. During the year, periodic security assessments were conducted in an effort to continually improve data protections and reduce response times and risks associated with cyber intrusions from both internal and external origins.

76. The physical protection of the Department's facilities is intrinsic to the information security programme. The Department maintains an extensive physical security management system. Over the past two years, it has been actively engaged in a feasibility study to improve its effectiveness through considering the implementation of a more "open architecture" to reduce reliance on a single vendor. This study is near completion with a decision expected later in 2022.

77. The Department increased the amount of information security awareness training provided, as well as the frequency of awareness testing and the measurement of results. The focus of the awareness programme continued to highlight the threat from email phishing attacks as well as the proper classification, handling, and protection of safeguards information.

C.14. Safeguards Reporting

78. The Secretariat reported the safeguards conclusions for 2021 in *The Safeguards Implementation Report for 2021* (GOV/2022/25), which also provided data on the number and type of facilities and LOFs under safeguards, and the inspection effort and related cost of safeguards implementation.²¹ At its June 2022 meeting, the Board of Governors took note of the report and authorized the release of the 'Safeguards Statement for 2021' and of the 'Background to the Safeguards Statement and Summary'.²²

²⁰ GC(65)/RES/12, OP 38.

²¹ GC(65)/RES/12, OP 39.

²² The 'Safeguards Statement for 2021' and the 'Background to the Safeguards Statement and Summary' is available at: <https://www.iaea.org/sites/default/files/22/06/statement-sir-2021.pdf>



The Safeguards Implementation Report for 2021 (GOV/2022/25)

C.15. Strategic Planning and Partnerships

79. The Department of Safeguards conducts internal strategic foresight and planning activities to help ensure that safeguards continue to be implemented effectively, efficiently and resiliently into the future. In January 2022, the Agency published a document entitled *Enhancing Safeguards Capabilities – Resource Mobilization Priorities*, previously known as the *Research and Development (R&D) Plan*. The document supports the Agency’s resource mobilization activities for safeguards by identifying a prioritized set of high-level capabilities, to be either developed or further enhanced, for which the Agency is seeking external support ranging from R&D to expertise and funding. The Agency also issued its *Development and Implementation Support Programme for Nuclear Verification* that communicates the specific support needed to improve the Agency’s technical capabilities to Member States for the 2022-2023 biennium.

80. During the reporting period, the Agency forged new partnerships in support of Agency safeguards. For the first time since 2013, a new MSSP was established with Switzerland, coordinated by the Swiss Federal Office of Energy, initiating its support activities with a financial contribution. Furthermore, the Agency signed practical arrangements with six entities: the Center for Energy and Security Studies (CENESS, the Russian Federation), the European Safeguards Research and Development Association (ESARDA, Italy), the Institute of Nuclear Materials Management (INMM, the United States of America), Open Nuclear Network (ONN, Austria), Rosatom Technical Academy (RTA, the Russian Federation) and the Verification Research, Training and Information Centre (VERTIC, the United Kingdom). The new partnerships further broadened the support base for Agency safeguards.



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