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STRENGTHENING THE EFFECTIVENESS AND IMPROVING THE EFFICIENCY OF AGENCY SAFEGUARDS

Report by the Director General

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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(66)/RES/10 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 67th regular session. This report responds to that request and updates the information in last year’s report to the General Conference (document GC(66)/13).¹

¹ This report covers the period between 1 July 2022 and 30 June 2023.

B. Safeguards Agreements and Additional Protocols

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

2. Between 1 July 2022 and 30 June 2023, 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 Cabo Verde and for Sao Tome and Principe. Furthermore, a CSA with an SQP based on the revised standard text entered into force for the State of Palestine.³ SQPs based on the original standard text were amended for Namibia, Suriname and Tuvalu, in keeping with the Board of Governors' decision of September 2005 regarding such protocols. As of 30 June 2023, 78 States⁴ had an operative SQP in force based on the revised standard text, and 22 States⁵ had an operative SQP in force based on the original standard text.

3. As of 30 June 2023, 190 States^{3,6} had safeguards agreements in force with the Agency, 141 of which (including 135 States with CSAs) also had an AP in force. Forty-nine States had yet to bring into force APs to their safeguards agreements.

4. Four States Party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)⁷ 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.⁸

As of 30 June 2023,

190 States^{3,6}
had safeguards
agreements in force with
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of which
141 States

(Including 135 States
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² GC(66)/RES/10, OP 17.

³ The designation employed does not imply the expression of any opinion whatsoever concerning the legal status of any country or territory or of its authorities, or concerning the delimitation of its frontiers.

⁴ This number does not include two operative SQPs reproduced in INFCIRC/718/Mod.1 and INFCIRC/366/Mod.1, respectively.

⁵ This number does not include one operative SQP reproduced in INFCIRC/229.

⁶ And Taiwan, China.

⁷ The referenced number of States Parties to the NPT is based on the number of instruments of ratification, accession or succession that have been deposited.

⁸ <https://www.iaea.org/sites/default/files/20/01/sg-agreements-comprehensive-status.pdf>

Between 1 July 2022 and 30 June 2023, SQPs based on the original standard text were amended for

3 States

As of 30 June 2023,

78 States⁴

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

22 States⁵

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 Protocols⁹

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*.¹⁰ 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 Agency's 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 an event with the Pacific Islands States and online events with Tonga, Oman and Kyrgyzstan. 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 Approaches¹¹

8. General Conference resolution GC(66)/RES/10 welcomed, inter alia, 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 — also known as the '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 at the State level.¹²

⁹ GC(66)/RES/10, OP 17 and 18.

¹⁰ The plan of action is available on the Agency's website at: <https://www.iaea.org/sites/default/files/22/10/sg-plan-of-action-1-july-2021-to-30-june-2022.pdf>

¹¹ GC(66)/RES/10, OP 28, 31 and 32.

¹² GC(66)/RES/10, OP 24 and 28.

9. The Agency has continued to progressively develop and implement State-level safeguards approaches (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 increase consistency in the development of SLAs for States with a broader conclusion.

11. The Agency continued to focus 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 a State's nuclear fuel cycle capabilities, the selection of technical objectives, the introduction of departmental values for technical objective performance targets, and the determination of the frequency and intensity of safeguards activities from these performance targets. The Agency also enhanced its software tools used in the development of acquisition path analyses and SLAs, and updated the related guidance.

12. Based on the refined methodology, as of 30 June 2023, the Agency had updated SLAs for 22 States with the broader conclusion. Further testing of the updated guidance was carried out, and software tools were enhanced to assist in safeguards planning and effectiveness evaluation.

13. The total number of States with a CSA in force for which an SLA has been developed stands at 134. These 134 States hold 97% of all nuclear material (by significant quantity) under Agency safeguards in States with a CSA in force. These 134 States are comprised of 71 States with a CSA and an AP in force for which the broader conclusion has been drawn for 2022 (of which 18 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 2022 (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, as follows:¹³

- Held the 14th Symposium on International Safeguards, which celebrated 60 years of IAEA inspections, 50 years of CSAs, and 25 years of APs;
- Updated and issued an anniversary edition of the IAEA Safeguards Glossary;
- Held a Technical Meeting with Member States focused on the Agency's use of safeguards relevant information;
- Presented the work of the Department of Safeguards to the United Nations Disarmament Fellows in October and to diplomats from Vienna-based Permanent Missions via the seminar 'Introduction to the IAEA: A Seminar for Diplomats' in November;

¹³ GC(66)/RES/10, OP 29.

- Held a day-long seminar on Agency safeguards for new delegates from Vienna-based permanent missions;
- Organized two in-person side events and two hybrid (on-line and in-person) side events on the margins of the 66th IAEA General Conference;
- Organized three tours of the IAEA safeguards laboratories at the Vienna International Centre on the margins of the 66th IAEA General Conference;
- Organized in-person tours of the Safeguards Analytical Laboratory (SAL) in Seibersdorf; and
- Co-organized or presented at a number of nuclear safeguards and non-proliferation events sponsored by outside organizations.

15. The Agency organized its 14th Symposium on International Safeguards under the theme 'Reflecting on the Past and Anticipating the Future' in celebration of 60 years of IAEA inspections, 50 years of CSAs and 25 years of APs. The Symposium's objectives were to reflect on the experience gained and lessons learned over the course of decades of safeguards implementation; anticipate the new challenges and opportunities for safeguards arising from a changing operating environment; and identify actions, stakeholders, and partnerships to help ensure a safeguards system that is well-prepared for continued success in the decades ahead. The programme featured 70 different sessions, over 160 presentations, 24 exhibitors and three experiential rooms devoted to different futures. Some 970 participants and observers from 124 States and 15 organizations attended the event, increasing geographic diversity to the highest level to date for a safeguards symposium (+38% increase). Of the participants and observers, 38% were women, representing the highest share of female participation to date for a safeguards symposium. The Symposium's programme, video recordings, papers, e-posters, and other related information can be accessed on the Symposium website along with the report of the event.



*IAEA Director General Grossi speaks at the 14th Symposium on International Safeguards
(Photo: IAEA)*

C.3. Strengthening Safeguards Implementation in the Field

16. The Agency has continued to seek improvements to the effectiveness and efficiency of safeguards implementation in the field. These improvements include advances related to both safeguards equipment and safeguards approaches.

17. Site or facility-specific safeguards approaches/procedures were developed or improved for:

- The application of short-notice random inspections at conversion and fuel fabrication facilities in Kazakhstan;
- The verification of spent-fuel transfers between two nuclear sites in Canada;
- The application of temporary containment and surveillance measures during expansion modifications of a spent-fuel dry-storage facility in Spain;
- The application of more efficient verification processes based on remote data transmission at a nuclear material storage facility in India;
- The verification of spent-fuel transfers between a nuclear power plant and an interim dry storage facility in Switzerland;
- The verification of spent fuel transfers to dry storage and the application of a dual containment and surveillance system at a nuclear power plant in Argentina;
- The application of a dual containment and surveillance system with routine use of remote data transmission at a nuclear material storage facility in the United Kingdom; and
- The verification of nuclear material and implementation of safeguards activities at the Japan Atomic Energy Agency Nuclear Fuel Cycle Engineering Laboratories site (JNC-1) in Japan.



An IAEA nuclear safeguards inspector conducting an in-field activity (Photo: IAEA)

18. The Agency continued to prepare, with Member States' support, for the future application of safeguards to new types of facility (e.g., geological repositories and encapsulation plants, pyroprocessing facilities, molten salt reactors, floating reactors, small 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 features early in the design stages of a facility. During the reporting period, the interdepartmental working group on safeguards by design continued to foster knowledge sharing and enhanced cooperation within the Agency on this subject. In addition, in collaboration with the Department of Nuclear Safety, early interaction with small modular reactor designers continued, as part of several Member State Support Programme (MSSP) tasks on 'safeguards by design'.

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

20. Following approval by the Japanese safety authorities, the construction of the main process building at the Japan Mixed-Oxide Fuel Fabrication Plant restarted in September 2022. Consequently, the Agency started to plan and deploy the necessary resources to implement the required safeguards systems before the end of the construction, which is still scheduled for completion in the second half of 2024.

21. Under the CANDU Equipment Based Approach (CEBA) project, the Agency and Canada are cooperating to enhance the technical safeguards measures implemented at operating CANDU nuclear reactors. Through further expanding the use of video surveillance and unattended monitoring systems, the verification and monitoring of spent fuel transferred from reactors to dry storage facilities will become more effective while the presence of inspectors in the field may be reduced.

22. The United States of America requested the Agency to consider applying safeguards during the future disposition of plutonium into a long-term geological repository. The plutonium involved is currently subject to safeguards pursuant to the State's Voluntary Offer Agreement (INFCIRC/288). In the reporting period, the Agency completed the design of a relevant safeguards approach and associated verification techniques, including an extensive reliance on surveillance and unattended monitoring systems.

C.4. Information Technology

23. In accordance with the Department of Safeguards' strategic priorities, the Agency maintained its effort to enhance current safeguards software capabilities as well as to create new ones. In the reporting period, the Agency prioritized the integration of applications for modernizing its Information Technology (IT) infrastructure to better support users' requirements. Information systems were enhanced on the basis of new technologies, improved integration for better collaboration, digital transformation of safeguards processes, and the development of IT capabilities to automate repetitive tasks and decrease manual data entries.

24. During the year, the Agency enhanced its IT capabilities in the areas of analysis, services, collaboration with States and verification activities, thereby increasing the efficient use of resources, such as staff time, which resulted in high user satisfaction ratings. Among the new and improved IT capabilities were:

- Enhanced reporting of safeguards verification activities with a modern, efficient and easy-to-learn user interface featuring improved data integration to reduce manual data entry;

- Improved IT capabilities to support acquisition path analysis and the development of SLAs;
- Implemented a new task management system for the Department of Safeguards' Division of Technical and Scientific Services, including more granular reporting on technical activities, thereby allowing more efficient planning of resources;
- Updated the State Declaration Portal (SDP) to allow the submissions of new document types and to provide States with the capability of full validation of nuclear material accountancy reports prior to their submission to the Agency;
- Digitized and streamlined equipment management processes with workflow enhancements for better coordination between inspectors and the Division of Technical and Scientific Services; and
- Enhanced document management workflows through a new document management system for documents subject to the Quality Management System (QMS) and further increased digitization of safeguards-related documentation.



Secure tokens needed by States to use the State Declaration Portal (SDP) (Photo: IAEA)

C.5. Information Analysis

25. The analysis of safeguards relevant information 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 with the results of Agency verification activities and other safeguards relevant information available to it. In support of this process, the Agency draws on an increasing amount of information from verification activities performed at Headquarters and in the field, including the results from non-destructive assay (NDA), destructive analysis (DA), environmental sampling (ES) analysis and data transmitted by remotely-monitored equipment. The Agency also draws

on a diverse range of other sources of safeguards relevant information, including commercial satellite imagery and trade information. Throughout the reporting period, the Agency continued to identify new safeguards relevant open sources of information, improve processes and enhance methodologies and tools for information collection and analysis. The introduction of artificial intelligence/machine learning aimed at providing assistance to analysts in relation to the prioritization of safeguards relevant information enabled an improvement in efficiency and effectiveness.

26. 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. Information analysis also encompasses the evaluation of all samples collected for safeguards purposes, which is performed by the Agency at its Headquarters.

27. In the reporting period, the Agency published a revision of the International Target Values (ITV) in the report *International Target Values for Measurement Uncertainties in Safeguarding Nuclear Materials* (STR-368, Revision 1.1). The ITV provide a reference system to assess the quality of safeguards measurement results, which is an important element of the effectiveness of the safeguards system. The revised ITV report contains an extensive update and expansion of the previous report, and it is available on the IAEA CONNECT platform.¹⁴ This website includes extended and modernized ITV tables in an electronic format as well as a set of related resources. It has two levels of access: open access for the broader safeguards measurement audience and restricted access for the members of the ITV Network of Experts which provides a collaborative framework between the Agency and more than 100 international experts for the continuous review of the ITV.

28. In the reporting period, the Agency continued to extend its sources of safeguards relevant information and associated methodologies, while enhancing dedicated tools, including those aimed at increasing the number of open-source information items collected automatically, validated by a safeguards analyst, and assessed as safeguards relevant. Progress was made, inter alia, in the area of using machine learning for more efficient collection and processing of information. Processes were also adjusted to enhance and expand the production of continuous monitoring alerts as well as the production of consolidated analytical products, improving effectiveness. Data on nuclear relevant trade from public and internal sources continued to be used to assess the consistency and completeness of nuclear activities declared by States to the Agency. In addition, the Technical Cooperation project concepts proposed for 2024–2025 were reviewed to assess their safeguards relevance.

29. In the reporting period, the Agency continued to use new satellite imagery data services and technology, including online streaming of satellite imagery, synthetic aperture radar sensors and satellites with a high revisit rate. These services enhance the Agency's capabilities in this area, including inter alia the possibility for the Agency to select directly from the provider's online catalogue the imagery most relevant to support the State evaluation process.

¹⁴ <http://connect.iaea.org>



*Agency staff members prepare a satellite imagery-based briefing in support of an in-field activity
(Photo: IAEA)*

C.6. Analytical Services

30. The Agency collects, analyses and evaluates DA and environmental samples to verify States' declarations and reports.

31. 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 25 qualified laboratories in Australia, Brazil, China, the Czech Republic, 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.

32. 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.

33. In the reporting period, MSSPs provided reference materials and support to advance analytical techniques and also contributed to cooperation projects in support of the Agency's quality control effort. Moreover, the Agency's ESL, as well as other members of the NWAL, continued to develop uranium particle age determination capabilities.

C.7. Equipment and Technology

34. In the reporting period, the Agency continued to provide uninterrupted technical support and equipment for safeguards verification activities, despite some remaining restrictions associated with the COVID-19 pandemic, and increases in shipment costs.

35. The Agency continued to deliver technical assistance for activities in the field, and conducted the scheduled field technical work necessary to maintain the required performance of the deployed safeguards equipment.

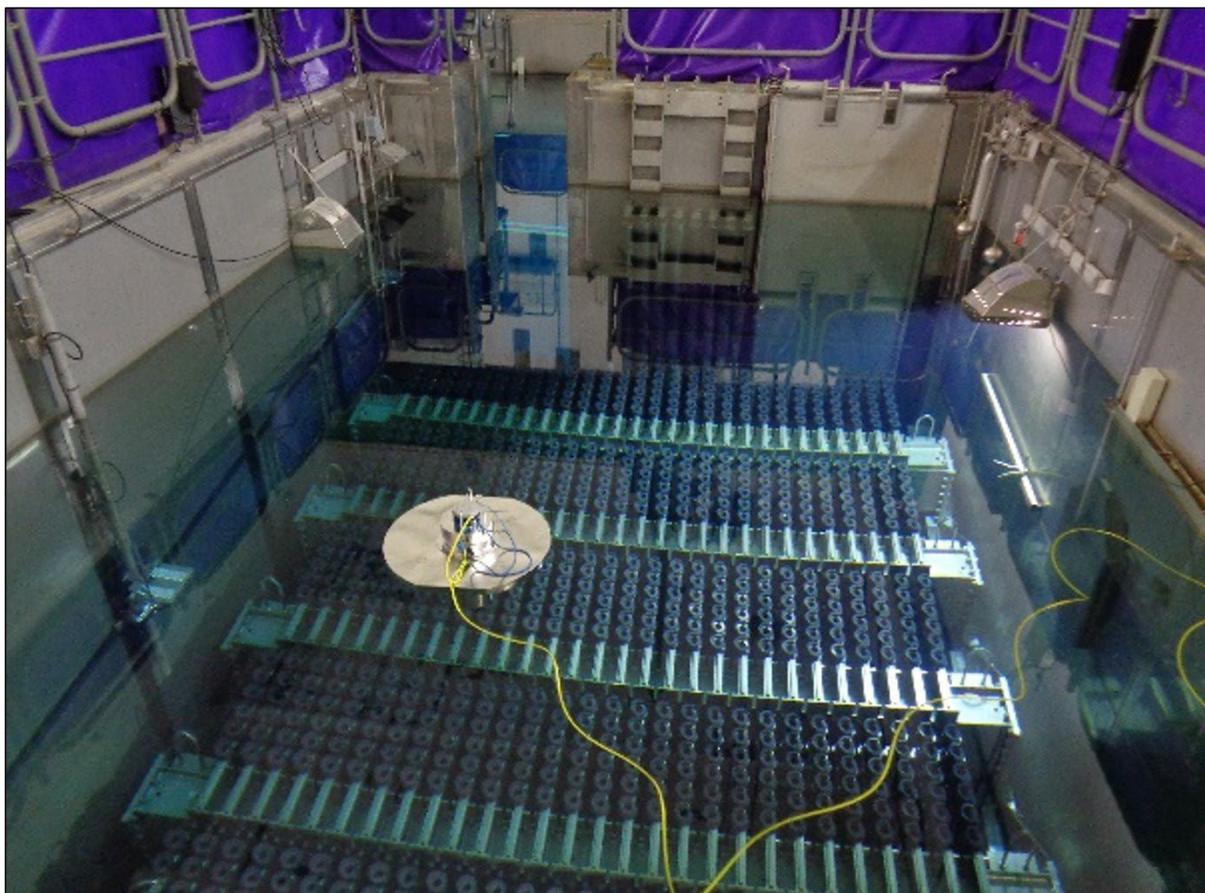
36. The Agency's investment in resources for enhancing data analysis, remote data transmission consolidation, unattended monitoring systems (UMS), and containment and surveillance systems applied in the field, continued to play a vital role in maintaining continuity of knowledge on nuclear material and essential equipment at facilities where physical access to Agency inspectors is impacted. This has proven relevant, particularly in the context of the armed conflict in Ukraine. During the reporting period, the reliability of digital surveillance systems, NDA systems, UMS and electronic seals used in the field met the target of 99.9% availability. This high level of infrastructure availability has been regularly achieved over recent years through robust safeguards system architecture — implying redundancy and modularity — and implementation of preventive maintenance policies. The performance of these systems contributed significantly to the attainment of Agency safeguards objectives for the reporting period.

37. State and Regional Authorities 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; and
- The design of UMS at new facilities, including the EPGR in Finland and other facilities in Belgium, Italy and Slovakia.

38. 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. The ERML was re-accredited by the Austrian Accreditation Body as a testing laboratory for direct and indirect measurements of surface contamination. The ERML was also re-authorised by the IAEA's Radiation Safety and Nuclear Security Regulator for performing activities with ionising radiation.

39. In the reporting period, the robotized Cherenkov viewing device (RCVD) was successfully tested in two States, and validated for the first time for partial defect verification of spent-fuel in another State. This system can significantly reduce the time required to verify the spent fuel inventory as well as the radiation exposure of inspectors and facility operators during the verification of spent-fuel stored in ponds. The Active Universal Asymmetric Seal (AUAS), a newly developed electronic seal, was authorized for use. The AUAS has a substantially lower life cycle cost, and is intended to replace the Electronic Optical Sealing System (EOSS) which is becoming obsolete.



The Robotized Cherenkov Viewing Device (RCVD) (Photo: IAEA)

C.8. Asset Management

40. At the end of June 2023, the Agency had nearly 54 000 active items registered in the safeguards asset registry (SEQUOIA). These items cost the Agency over €255 million and are deployed to support safeguards activities in over 65 States. Under the Integrated Lifecycle Management of Safeguards Assets (ILSA) project, the Agency 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. In the reporting period, the ILSA project continued the practice of an annual 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. The review focused on assets or asset groups costing the Agency more than €150,000, labelled as high risk, or expected to be replaced by the end of 2027. After this review and an adjustment to a much higher inflation rate, the Agency foresees the financial requirements to replace the current suite of assets significantly higher than the historical contributions starting in the late 2020s. The Agency will continue to improve its Safeguards asset management system to ensure that it obtains the maximum value from its assets and provide strong quantitative justification should additional funding be required.

41. During the reporting period, the Agency also concluded a set of in-depth explorations of the full lifecycle resource needs, usage of assets, and a quantitative risk analysis for some of the most critical and costly assets. These reviews estimated the costs over the full lifetime of the asset including the purchase, normal operations and maintenance. Moreover, these reviews estimated the costs to the Agency associated with the possible failure of the assets, and helped the Agency develop methodologies to quantitatively determine the level of service and number of pieces of safeguards equipment required and risks of delaying procurement or opportunities to expedite procurement.

C.9 Evaluation of the Effectiveness of Safeguards Implementation

42. Effectiveness evaluation is a process involving every step of safeguards implementation 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 reviewed by departmental committees and safeguards evaluators.

43. Internal evaluation of the effectiveness of safeguards implementation was performed through peer reviews of Annual Implementation Plans (AIPs) and State Evaluation Reports (SERs). The AIPs approved at the beginning of the year are reviewed to assure that safeguards activities conducted in the field and at Headquarters are planned to a level sufficient to achieve the safeguards objectives for the year. Afterwards, the AIPs are reviewed to assure that planned safeguards activities were successfully conducted and, whenever safeguards implementation issues were encountered, actions related to their resolution were properly taken.

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44. SERs 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 of Safeguards to peer review the State evaluation for a selected number of States.

45. Results from effectiveness evaluation activities are recorded and reported to senior management within the Department of Safeguards, identifying good practices and areas for improvement, and highlighting recommended actions.

C.10. Cooperation with, and assistance to, SRAs¹⁵

46. 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), and regional systems of accounting for and control of nuclear material (RSACs), as well as on the level of cooperation between SRAs and the Agency.

47. Actions that contributed to the enhancement of the effectiveness and efficiency of Agency safeguards implementation were undertaken by a number of States, within the framework of existing or newly launched initiatives, supported by the in-kind and financial contributions of Member States and the European Commission.

C. 10.1. COMPASS and other efforts to strengthen the effectiveness of SSACs/SRAs¹⁶

48. In 2020, the Agency launched the IAEA Comprehensive Capacity-Building Initiative for SSACs and SRAs (COMPASS) to further support States in their efforts to strengthen and sustain the effectiveness of their SRA and respective SSAC, and thus address any related areas of difficulty in safeguards implementation. Seven States¹⁷ were invited by the Agency to join the initiative for its two-year pilot phase. Detailed workplans were developed for each of these States to address the specific needs identified in the joint assessments conducted in collaboration with designated officials from the pilot States. These workplans included multifaceted assistance as well as an implementation timeline and arrangements for project monitoring and assessment. The implementation of COMPASS commenced in 2021 for the seven pilot States upon their formal acceptance of the workplan.

49. The implementation continued until March 2023 when the pilot phase was successfully concluded with the seven pilot States. During the pilot phase, a total of 96 activities were conducted in-line with the respective agreed workplans with the pilot States. These activities were designed to strengthen their SSAC/SRA in such areas as laws and regulations; processes and procedures; staff training; outreach to SSAC stakeholders and operators; information management systems; as well as NDA capabilities.

50. Eighteen Member States and/or Member State Support Programmes have provided financial and/or in-kind contributions to COMPASS. Among them, seven partners made financial contributions and 12 supported the implementation of 28 of the activities undertaken in the pilot phase. Their in-kind support allowed for direct consultations between experts from supporting States and pilot States' representatives to share experience and knowledge on different aspects of safeguards implementation. This was mainly done through training, technical visits to share good practices on the conduct of inspections, and the development of national training programmes to further support capacity building within the State.

51. The Agency conducted numerous events dedicated to strengthening the effectiveness of SSACs/SRAs. These events included international, regional and national training courses for personnel responsible for overseeing and implementing safeguards in States, technical visits, virtual training

¹⁵ GC(66)/RES/10, OP 11.

¹⁶ GC (66)/RES/10, OP 38.

¹⁷ Guatemala, Jordan, Malaysia, Rwanda, Saudi Arabia, Türkiye and Uzbekistan.

events, and other activities. In total, more than 450 participants from some 70 States were trained on safeguards-related topics. These events were carried out with financial and in-kind support from a number of Member States.

52. The Agency also continued to host and expand its e-learning offerings.¹⁸ Over 1800 registered users are provided access to a password protected virtual classroom through which the electronic version of instructional materials, including Agency safeguards-related guidance documents, can easily be downloaded. Among the new offerings added is an online repository for references/examples shared by both the COMPASS pilot States and partners for a broader safeguards community. The online repository includes presentations, procedures, guidelines, and other open resources that can be referred to by any users wishing to further improve their SSAC and develop new documents for the implementation of safeguards.

53. On 2 June 2023, an event was held marking the successful completion of COMPASS and detailing the next steps.¹⁹



*IAEA staff conduct capacity building activities in a COMPASS pilot state
(Photo: IAEA)*

¹⁸ CLP4NET is a platform for e-learning open to all with a NUCLEUS account and is available at <https://elearning.iaea.org>

¹⁹ More information can be found at <https://www.iaea.org/topics/assistance-for-states/compass>

C.10.2. Other initiatives enhancing cooperation with State and regional authorities

54. Beyond COMPASS and training dedicated to strengthening the effectiveness of SSACs/SRAs, the Agency undertakes other support activities and initiatives in cooperation with SRAs to help strengthen safeguards implementation.

55. The Agency continued discussions with ABACC and the European Commission aimed at strengthening cooperation and enhancing the effectiveness and efficiency of safeguards implementation in the relevant States. A task force with Japan continued to address the long-term verification challenges at the Fukushima Daiichi site.

56. The Agency conducts International Safeguards and SSAC Advisory Service (ISSAS) missions to States, at their request, with advice and recommendations on the establishment and strengthening of SSACs. During the reporting period, Türkiye requested an ISSAS mission, and hosted the preparatory ISSAS mission in October 2022. The ISSAS mission is planned for the second half of 2023.

57. The Department of Safeguards participates in Integrated Nuclear Infrastructure Review (INIR) missions. The Agency's 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. These missions cover 19 infrastructure issues, of which one is safeguards, to be considered during the different stages of developing a nuclear power programme. For more information see the Agency publication *Milestones in the Development of a National Infrastructure for Nuclear Power* (NG-G-3.1 (Rev. 1)).

58. In the reporting period, the Agency published a technical report in the Nuclear Energy Series entitled *Enhancing National Safeguards Infrastructure to Support the Introduction of Nuclear Power* (NG-T-3.25). This publication provides guidance on safeguards-related activities that need to be carried out during each of the three phases of nuclear power infrastructure development.

59. The Agency also continued to expand and promote the State Declarations Portal (SDP), a web-based secure system that supports communication exchange with SRAs. In addition to providing a faster, effective and more secure way to communicate with SRAs, the SDP allows for better integration with other safeguards applications and for more efficient analysis of the information received. Data security is a key feature of the SDP, which uses multiple reinforcing security layers to guarantee the confidentiality of communications between the Agency and SRAs. To enhance institutional memory, the SDP also offers a digital historical log of these communication exchanges. Since its launch in 2017, the SDP has become a widely used communication portal that has gradually expanded its scope to handle 22 different types of submissions, including nuclear material accounting reports, declarations under the AP and Design Information Questionnaires (DIQs).

C.11. Safeguards Workforce

60. In the reporting period, approximately 50 distinct training courses often with multiple course offerings were held, helping to provide safeguards inspectors, analysts and support staff with the necessary core and functional competencies.

61. The Introductory Course on Agency Safeguards (ICAS), a six-month course consisting of ten modules, was completed by 12 new inspectors, and three comprehensive inspection exercises were held.²⁰ A new ICAS commenced in March 2023 for 15 inspectors.

²⁰ The 10-module ICAS is counted as one course.

62. In the reporting period, over 20 course offerings were held outside Agency Headquarters, mainly at Member States' nuclear facilities. Courses held at nuclear facilities are designed to enhance practical competencies for safeguards implementation in the field. They enable effective and integrated training of safeguards staff in a realistic environment. In particular, they improve inspectors' ability to prepare for, conduct and report on inspection, design information verification and complementary access. Courses held at Headquarters aim to develop skills for analysing safeguards relevant information using different techniques, including collaborative analysis tools.

63. In order to build capacity and establish a culture of continuous learning for all staff in the Department of Safeguards, the 'Safeguards Webinar Series' provided staff with five sessions on key topics in safeguards implementation, including personal development, continual improvement, the Field Verifiable Passive Seal (FVPS), annual implementation planning and the questionnaire on SSAC/SRA's performance. Each webinar was attended by approximately 65 staff, with as many as 95 participants attending two of these webinars. The webinar recordings are accessible to staff in the Department of Safeguards.

64. Training needs analyses and training effectiveness evaluations for selected courses are conducted according to the Systematic Approach to Training methodology as part of a continuous improvement plan. In the reporting period, a training effectiveness evaluation was completed for one course; training needs analyses were developed for a course on State evaluation, and a training for senior inspectors on industrial health and safety was also held.

65. The Agency has over 90 training-related MSSP tasks and continues to engage with MSSPs in the development of training methodologies and tools, as well as in the conduct of courses both at Headquarters and at nuclear facilities. The ongoing support for staff training by MSSPs enables the Department of Safeguards to ensure access to facilities which is critical for inspectors to practice and develop their skills.

66. In addition to Agency staff training, the Agency successfully completed the 2022 Safeguards Traineeship Programme for Young Graduates and Junior Professionals for nine participants from Algeria, Cameroon, Costa Rica, Guyana, Nigeria, Panama, Tajikistan, the United Republic of Tanzania and Yemen. The 2023 programme commenced in February 2023, with participants from Bangladesh, Georgia, Lesotho, Sierra Leone, Sudan, Vietnam, and Zambia. Over the course of approximately 10 months, this programme continued to provide young professionals with knowledge and skills to return to their work in the area of peaceful nuclear energy and safeguards in their State and provides them the foundation upon which to build a career in the area of IAEA safeguards. The programme's success relied on support from the Czech Republic, Finland, France, Hungary, the United States of America and the European Commission. A session on the Safeguards Traineeship Programme for Young Graduates and Junior Professionals was held at the Symposium on International Safeguards, culminating in a paper documenting the history of the programme and a new information site on the Agency learning management system, CLP4NET.

67. In line with the Agency Gender Equality Policy, 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.

68. As of 30 June 2023, 39% of all regular staff members in the Department of Safeguards were women. According to the gender scorecard analysis for the Department of Safeguards, women represented 31% of the staff in the Professional and higher categories. Women comprised 30% of the safeguards inspectors in the Divisions of Operations and the Office for Verification in Iran, and 30% of positions at the Section Head level and above.

69. The Department of Safeguards, in line with other Departments in the Agency, has developed a Gender Action Plan to define its framework of action in the area of gender and gender mainstreaming. Diversity and inclusion workshops, communications and networks form an important part of this Plan. The Department of Safeguards continues to prioritize activity to encourage women candidates in recruitment exercises, enhancing outreach opportunities and ensuring improved gender balance on recruitment panels. The five-year trend of the percentage of women in the Professional and higher categories in the Department of Safeguards shows the steady progress made in this area. The Department of Safeguards will continue to focus on gender parity in recruitment as well as on implementing additional measures to support wider diversity, inclusion and career development.



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

C. 12. Quality Management

70. The Quality Management System (QMS) within the Department of Safeguards provides regular oversight of the key safeguards processes to ensure impartiality, effectiveness and efficiency of safeguards implementation. 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 of Safeguards 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

71. The Agency 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 reporting period, the Agency made significant progress with the replacement of aging IT infrastructure with modern, more flexible hardware. This effort also establishes the foundation for disaster recovery capabilities at the Agency's premises in Seibersdorf. The implementation will take a phased approach throughout 2023 and into 2024. During the reporting period, the Agency also began

building IT Disaster Recovery capabilities for the IAEA Regional Tokyo Office. Implementation is expected to continue until early 2024.

72. Business continuity and disaster recovery efforts in the context of the COVID-19 pandemic were concluded. The Agency resumed normal operations following the lifting of pandemic-related restrictions.

73. The Agency faced new unexpected challenges to its operations as a consequence of the armed conflict in Ukraine. The Agency's emergency preparedness played an important role in supporting continuous operations in Ukraine. Staff were equipped with the appropriate technological support to ensure the necessary care and protection for the health and well-being of Agency staff.

74. Safeguards information security continued to be a priority.²¹ The Agency continued to drive risk-focused improvements in the area of information protection. The Agency focused its resources and efforts based on its assessment of both the greatest areas of risk as well as the potential impact and effectiveness of these improvements.

75. In the area of information security, the Agency conducted assessments and made continuous efforts to identify and remediate vulnerabilities in order to reduce the risk of targeted cyber intrusion. In efforts to improve both its ability to detect and to respond to a cyber-attack, the Agency focused on creating and testing standardized responses to typical threat scenarios. As threats continue to evolve and grow in potency, the Agency recognized the need for increased detection and response capabilities and conducted an assessment of future enhancements to the security mechanisms on the computers of its highly mobile workforce.

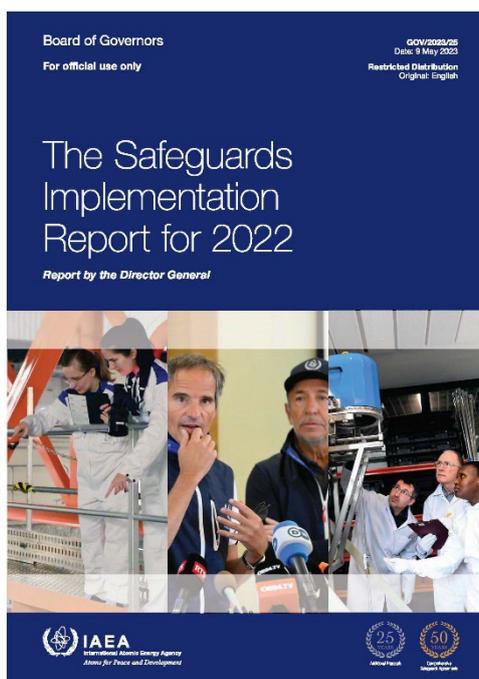
76. Physical security controls, in the form of access control and monitoring, are a crucial part of the Agency's information protection standards. The Agency completed an assessment of the physical security system that controls and monitors access to the secure areas at Agency Headquarters. In efforts to ensure the most efficient use of resources, the Agency was involved in an analysis of the options to either replace or refresh the existing system in order to ensure utility and cost effectiveness for the future. At the conclusion of the analysis, the Agency began executing a plan to refresh the system.

C. 14. Safeguards Reporting

77. The Secretariat reported the safeguards conclusions for 2022 in *The Safeguards Implementation Report for 2022* (GOV/2023/25), which also provided data on the number and type of facilities and Locations Outside Facilities (LOFs) under safeguards, and the inspection effort and related cost of safeguards implementation. At its June 2023 meeting, the Board of Governors took note of the report and authorized the release of the 'Safeguards Statement for 2022' and the 'Background to the Safeguards Statement and Summary'.²²

²¹ GC(66)/RES/10, OP 41.

²² The 'Safeguards Statement for 2022' and the 'Background to the Safeguards Statement and Summary' is available at: https://www.iaea.org/sites/default/files/23/06/20230612_sir_2022_part_ab.pdf



The cover of the Safeguards Implementation Report for 2022 (Photo: IAEA)

C.15. Strategic Planning and Partnerships²³

78. 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. During the reporting period, the Agency used the document *Enhancing Safeguards Capabilities for Nuclear Verification – Resource Mobilization Priorities* (STR-399), previously known as the Research and Development (R&D) Plan for the Agency’s resource mobilization activities for safeguards. The document identifies a prioritized set of high-level safeguards capabilities for which the Agency is seeking external support. The Agency also published and began implementing its *Development and Implementation Support Programme for Nuclear Verification* for the 2022-2023 biennium (STR-400). This document communicates to Member States the specific support needed to improve the Agency’s technical capabilities.

79. During the reporting period, the Agency forged new partnerships in support of Agency safeguards. In a letter to the Director General in December, the United Arab Emirates formally declared its intention to establish a MSSP and provided extrabudgetary funding for initial activities. This MSSP will be the first to be established by a Member State from the Middle East region, contributing to the strength and geographic representation of Member States support to Agency safeguards. Furthermore, the Agency signed practical arrangements with the Stimson Center (the United States of America) and the Vienna Center for Disarmament and Non-Proliferation (VCDNP) (Austria). The new partnerships further broadened the support base for Agency safeguards.

80. In the reporting period, the Agency also contributed to the Specializing Master course on Nuclear Safeguards under the European Safeguards Training and Education (SaTE) project through the provision of lectures and workshops in the area of safeguards implementation, nuclear material accountancy and the AP, as well as non-destructive analysis. The course was organized by the Politecnico di Milano and the European Nuclear Education Network, in collaboration with the European Joint Research Centre.

²³ GC(66)/RES/10, OP 33.



*Agency staff deliver a presentation at an event organized by VCDNP, a partner organization
(Photo: IAEA)*



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