IAEA
Atoms for Peace

Board of Governors

GOV/2015/30
Date: 6 May 2015

Restricted Distribution
Original: English

For official use only

The Safeguards Implementation Report for 2014

Report by the Director General

Main Developments in 2014

- Two additional protocols entered into force and two operational small quantities protocols were amended.
- Under the Framework for Cooperation between the Agency and the Islamic Republic of Iran, sixteen practical measures were implemented out of a total of eighteen agreed.
- Following a series of consultations with Member States, a supplementary document providing clarifications and additional information on the State-level concept was submitted to the Board of Governors.
- The Agency held its twelfth Symposium on International Safeguards in Vienna.
- The replacement of obsolete surveillance equipment with the Next Generation Surveillance System continued.
- The modernization of safeguards information technology continued.

Recommended Action

The Board is invited to take note of the Agency's *Safeguards Implementation Report for 2014* attached hereto.

The Board is invited to authorize the release of the Safeguards Statement and the Background to the Safeguards Statement and Summary.

The Safeguards Implementation Report for 2014

Report by the Director General

A. Safeguards Statement for 2014

In 2014, safeguards were applied for 180 States[1, 2] with safeguards agreements in force with the Agency. The Secretariat's findings and conclusions for 2014 are reported below with regard to each type of safeguards agreement. These findings and conclusions are based upon an evaluation of all safeguards relevant information available to the Agency in exercising its rights and fulfilling its safeguards obligations for that year.

1. **One hundred and eighteen States had both comprehensive safeguards agreements and additional protocols in force:**

   (a) For 65 of these States[2], the Secretariat found no indication of the diversion of declared nuclear material from peaceful nuclear activities and no indication of undeclared nuclear material or activities. On this basis, the Secretariat concluded that, for these States, all nuclear material remained in peaceful activities.

   (b) For 53 of these States, the Secretariat found no indication of the diversion of declared nuclear material from peaceful nuclear activities. Evaluations regarding the absence of undeclared nuclear material and activities for each of these States remained ongoing. On this basis, the Secretariat concluded that, for these States, declared nuclear material remained in peaceful activities.

2. **Safeguards activities were implemented for 54 States with comprehensive safeguards agreements in force, but without additional protocols in force. For these States, the Secretariat found no indication of the diversion of declared nuclear material from peaceful nuclear activities. On this basis, the Secretariat concluded that, for these States, declared nuclear material remained in peaceful activities.**

While the Secretariat concluded that, for 2014, declared nuclear material in Iran remained in peaceful activities, it was unable to conclude that all nuclear material in Iran was in peaceful activities.[3]

3. **As of the end of 2014, 12 non-nuclear-weapon States party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) had yet to bring into force comprehensive safeguards agreements with the Agency as required by Article III of that Treaty. For these States, the Secretariat could not draw any safeguards conclusions.**

4. **Three States had safeguards agreements based on INFCIRC/66/Rev.2 in force, requiring the application of safeguards to nuclear material, facilities and other items specified in the relevant safeguards agreement. One of these States, India, had an additional protocol in force. For these States, the Secretariat found no indication of the diversion of nuclear material or of the misuse of the facilities or other items to which safeguards had been applied. On this basis, the Secretariat concluded that, for these States, nuclear material, facilities or other items to which safeguards had been applied remained in peaceful activities.**

---

[1] These States do not include the Democratic People's Republic of Korea (DPRK), where the Agency did not implement safeguards and, therefore, could not draw any conclusion.

[2] And Taiwan, China.

[3] See paragraph 23.

5. **Five nuclear-weapon States had voluntary offer agreements and additional protocols in force. Safeguards were implemented with regard to declared nuclear material in selected facilities in all five States. For these States, the Secretariat found no indication of the diversion of nuclear material to which safeguards had been applied. On this basis, the Secretariat concluded that, for these States, nuclear material in selected facilities to which safeguards had been applied remained in peaceful activities or had been withdrawn from safeguards as provided for in the agreements.**

B. Background to the Safeguards Statement and Summary

B.1. Safeguards conclusions

1. The Safeguards Statement reflects the Secretariat's findings and conclusions resulting from the Agency's activities under the safeguards agreements in force. The Secretariat derives these conclusions on the basis of an evaluation of the results of its safeguards activities and of all other safeguards relevant information available to it. This section provides background to the Safeguards Statement.

Fact box 1. Safeguards activities overview
In 2014, there were: • 193 467 (188 500)[4] significant quantities[5] of nuclear material and 432 (431) tonnes of heavy water under safeguards; • 704 (699) facilities and 563 (565) material balance areas (MBAs) containing locations outside facilities where nuclear material is customarily used (LOFs) under safeguards; and • 2114 (1969) inspections, 618 (573) design information verifications and 78 (71) complementary accesses utilizing 12 734 (11 777) calendar-days in the field for verification[6].

2. A summary of the status of States' safeguards agreements and other information presented below is given in Tables 1 to 5 in Section B.7.

B.1.1. States with comprehensive safeguards agreements in force

3. Under a comprehensive safeguards agreement, the Agency has the "right and obligation to ensure that safeguards will be applied, in accordance with the terms of the agreement, on all source or special fissionable material in all peaceful nuclear activities within the territory of the State, under its jurisdiction or carried out under its control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices."[7]

4. Comprehensive safeguards agreements consist of Part I, Part II, and Definitions. Part I consists of general provisions and Part II describes the procedures for implementing those provisions. These procedures include the record keeping and reporting obligations of the State with regard to nuclear material, nuclear facilities and LOFs. They also include procedures related to Agency access to nuclear material, nuclear facilities and LOFs.

---

[4] The numbers in parentheses provide the respective data for 2013.

[5] Significant quantity — the approximate amount of nuclear material for which the possibility of manufacturing a nuclear explosive device cannot be excluded.

[6] Calendar-days in the field for verification comprise calendar-days spent on performing inspections, complementary access and design information verification and on the associated travel and rest periods.

[7] Paragraph 2 of INFCIRC/153 (Corrected).

5. The procedures set out in Part II of a comprehensive safeguards agreement include certain reporting requirements related to the export and import of material containing uranium or thorium which has not yet reached the stage of processing where its composition and purity make it suitable for fuel fabrication or for isotopic enrichment. Nuclear material which has reached that stage of processing, and any nuclear material produced at a later stage, is subject to all the other safeguards procedures specified in the agreement. An inventory of such nuclear material is established on the basis of an initial report by a State, which is then verified by the Agency and maintained on the basis of subsequent reports by the State and by Agency verification. The Agency performs its verification and evaluation activities in order to confirm that these declarations by the State are correct and complete — i.e. to confirm that all nuclear material in the State remains in peaceful activities.

Small quantities protocols

6. Many States with minimal or no nuclear activities have concluded a small quantities protocol (SQP) to their comprehensive safeguards agreement. Under a SQP based on the original standard text[8] submitted to the Board of Governors in 1974, the implementation of most of the safeguards procedures in Part II of a comprehensive safeguards agreement are held in abeyance as long as certain criteria are met. In 2005, the Board of Governors approved the revision[9] of the standard text of the SQP. This revision changed the eligibility criteria for a SQP, making it unavailable to a State with an existing or planned facility, and reduced the number of measures held in abeyance. Of particular importance is the fact that, under the revised text of the SQP, the requirement that the State provide the Agency with an initial inventory report and the Agency's right to carry out ad hoc and special inspections are no longer held in abeyance.

Additional protocols

7. Although the Agency has the authority under a comprehensive safeguards agreement to verify the peaceful use of all nuclear material in a State (i.e. the correctness and completeness of the State's declarations), the tools available to the Agency under such an agreement are limited. The *Model Additional Protocol*[10], approved by the Board of Governors in 1997, equips the Agency with important additional tools that provide broader access to information and locations. The measures provided for under an additional protocol thus significantly increase the Agency's ability to verify the peaceful use of all nuclear material in a State with a comprehensive safeguards agreement.

B.1.1.1. States with both comprehensive safeguards agreements and additional protocols in force

Status of implementation

8. As of 31 December 2014, 118 (117) States[2] had both comprehensive safeguards agreements and additional protocols in force.

9. Safeguards implementation involved, as appropriate, activities carried out in the field, at regional offices and at Agency Headquarters in Vienna. The activities at Headquarters included the evaluation of States' accounting reports and other information required under comprehensive safeguards agreements and additional protocols and the evaluation of safeguards relevant information from other sources.

---

[8] GOV/INF/276/Annex B.

[9] GOV/INF/276/Mod.1 and Corr.1.

[10] INFCIRC/540 (Corrected), *Model Protocol Additional to the Agreement(s) between State(s) and the International Atomic Energy Agency for the Application of Safeguards*.

Deriving conclusions

10. A safeguards conclusion that all nuclear material has remained in peaceful activities in a State is based on the Agency's finding that there are no indications of diversion of declared nuclear material from peaceful nuclear activities and no indications of undeclared nuclear material or activities in the State as a whole. The Agency draws such a conclusion only where a State has both a comprehensive safeguards agreement and an additional protocol in force and the evaluations described below have been completed.

11. To ascertain that there are no indications of diversion of declared nuclear material from peaceful nuclear activities in a State, the Agency needs to carry out a comprehensive evaluation of all safeguards relevant information available to it, which includes information provided by the State with regard to the design and operation of nuclear facilities and LOFs, the State's nuclear material accounting reports, the State's declarations submitted under the additional protocol and the results of the Agency's in-field activities carried out to verify the State's declarations.

12. To ascertain that there are no indications of undeclared nuclear material or activities in a State, the Agency needs to carry out an evaluation of the consistency of the State's declared nuclear programme with the results of the Agency's verification activities under the relevant safeguards agreements and additional protocols and with all other safeguards relevant information available to the Agency. In particular, the Agency needs to have:

- conducted a comprehensive State evaluation based on all safeguards relevant information available to the Agency about the State's nuclear and nuclear related activities (including design information on facilities and information on LOFs, declarations submitted under additional protocols, and information collected by the Agency through its verification activities and from other sources);
- performed complementary access, as necessary, in accordance with the State's additional protocol; and
- addressed all anomalies, discrepancies and inconsistencies identified in the course of its evaluation and verification activities.

13. When the evaluations described in paragraphs 11 and 12 above have been completed and no indication has been found by the Agency that, in its judgement, would give rise to a proliferation concern, the Secretariat can draw the broader conclusion that all nuclear material in a State has remained in peaceful activities. Subsequently, the Agency implements integrated safeguards — an optimized combination of safeguards measures available under comprehensive safeguards agreements and additional protocols — for that State. Due to increased assurance of the absence of undeclared nuclear material and activities for the State as a whole, the intensity of inspection activities at declared facilities and LOFs can be reduced. Integrated safeguards were implemented during 2014 in 53 (53) States[2, 11].

Overall conclusions for 2014

14. On the basis of the evaluations described in paragraphs 11 and 12, the Secretariat drew the conclusions referred to in paragraph 1(a) of the Safeguards Statement for 65 (63) States[2] — Albania,

[11] Armenia, Australia, Austria, Bangladesh, Belgium, Bulgaria, Burkina Faso, Canada, Chile, Croatia, Cuba, Czech Republic, Denmark, Ecuador, Estonia, Finland, Germany, Ghana, Greece, Holy See, Hungary, Iceland, Indonesia, Ireland, Italy, Jamaica, Japan, Latvia, Libya, Lithuania, Luxembourg, Madagascar, Mali, Malta, Monaco, the Netherlands, Norway, Palau, Peru, Poland, Portugal, Republic of Korea, Romania, Seychelles, Singapore, Slovakia, Slovenia, Spain, Sweden, The former Yugoslav Republic of Macedonia, Ukraine, Uruguay and Uzbekistan.

Andorra, Armenia, Australia, Austria, Bangladesh, Belgium, Botswana, Bulgaria, Burkina Faso, Canada, Chile, Croatia, Cuba, Czech Republic, Denmark[12], Ecuador, Estonia, Finland, Germany, Ghana, Greece, Holy See, Hungary, Iceland, Indonesia, Ireland, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kuwait, Latvia, Libya, Lithuania, Luxembourg, Madagascar, Mali, Malta, Mauritius, Monaco, Netherlands[13], New Zealand[14], Norway, Palau, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Seychelles, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, The former Yugoslav Republic of Macedonia, Turkey, Ukraine , Uruguay, Uzbekistan and Viet Nam. For Kazakhstan and Viet Nam the conclusion in paragraph 1(a) of the Safeguards Statement was drawn for the first time.

15. Because the evaluation process described in paragraph 12 had not yet been completed for 53 (54) States[15], the conclusion drawn for these States relates only to declared nuclear material in peaceful activities. The conclusion in paragraph 1(b) of the Safeguards Statement was drawn for: Afghanistan, Angola, Antigua and Barbuda, Azerbaijan, Bahrain, Bosnia and Herzegovina, Burundi, Central African Republic, Chad, Colombia, Comoros, Costa Rica, Cyprus, Democratic Republic of the Congo, Dominican Republic, El Salvador, Fiji, Gabon, Gambia, Georgia, Guatemala, Haiti, Iraq, Kenya, Kyrgyzstan, Lesotho, Malawi, Marshall Islands, Mauritania, Mexico, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nicaragua, Niger, Nigeria, Panama, Paraguay, Congo, Republic of Moldova, Rwanda, Saint Kitts and Nevis, Swaziland, Switzerland, Tajikistan, Togo, Turkmenistan, Uganda, United Arab Emirates, United Republic of Tanzania and Vanuatu.

B.1.1.2. States with comprehensive safeguards agreements in force but no additional protocols in force

Status of implementation

16. As of 31 December 2014, safeguards were implemented for 54 (55) States in this category. Safeguards implementation involved activities in the field and at Headquarters, including the evaluation of States' accounting reports and other information required under comprehensive safeguards agreements and the evaluation of safeguards relevant information from other sources.

Deriving conclusions

17. For a State with a comprehensive safeguards agreement, the Agency's right and obligation are as described in paragraph 3 above. Although the implementation of safeguards strengthening measures[16] under such an agreement have increased the Agency's ability to detect undeclared nuclear material and activities, the activities that the Agency may conduct in this regard are limited for a State

---

[12] This conclusion is drawn with regard only to that part of Denmark which is covered by INFCIRC/193 and INFCIRC/193/Add. 8; i.e. Denmark and the Faroe Islands, which excludes Greenland. Denmark has concluded a separate comprehensive safeguards agreement and an additional protocol thereto that apply to Greenland (INFCIRC/176 and INFCIRC/176/Add.1, respectively).

[13] This conclusion is drawn with regard only to that part of the Netherlands which is covered by INFCIRC/193 and INFCIRC/193/Add.8, i.e. the Netherlands in Europe, which excludes the Caribbean part of the Netherlands (the islands of Bonaire, Sint Eustatius and Saba), Aruba, Curaçao and Sint Maarten. The Netherlands has concluded a separate comprehensive safeguards agreement that applies to its constituent parts mentioned above (INFCIRC/229), but has not yet concluded an additional protocol thereto.

[14] This conclusion is drawn with regard only to that part of New Zealand which is covered by INFCIRC/185 and INFCIRC/185/Add.1; it is not drawn for the Cook Islands and Niue, which are covered by INFCIRC/185, but not by INFCIRC/185/Add.1.

[15] This conclusion is drawn with regard only to that part of Denmark which is covered by INFCIRC/176 and INFCIRC/176/Add.1 (i.e. Greenland) for which the broader conclusion was not drawn.

[16] Such measures include the early provision of design information, environmental sampling and the use of satellite imagery.

without an additional protocol. Thus, the conclusion in the Safeguards Statement for a State with a comprehensive safeguards agreement alone relates only to the non-diversion of declared nuclear material from peaceful activities.

18. In the course of its evaluation, the Agency also seeks to determine whether there is any indication of undeclared nuclear material or activities in the State which would need to be reflected in the Safeguards Statement. However, without the measures provided for in the *Model Additional Protocol* being implemented, the Agency is not able to provide credible assurance of the absence of undeclared nuclear material and activities for the State as a whole.

Islamic Republic of Iran

19. During 2014, the Director General submitted four reports to the Board of Governors titled *Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran* (GOV/2014/10, GOV/2014/28, GOV/2014/43 and GOV/2014/58 and Corr.1).

20. In 2014, contrary to the relevant binding resolutions of the Board of Governors and the United Nations Security Council, Iran did not: implement the provisions of its additional protocol; implement the modified Code 3.1 of the Subsidiary Arrangements General Part to its Safeguards Agreement; suspend all enrichment related activities or suspend all heavy water related activities. Neither did Iran resolve the Agency's concerns about possible military dimensions to Iran's nuclear programme. This resolution is necessary in order to establish international confidence in the exclusively peaceful nature of that programme.

21. In the Framework for Cooperation, the Agency and Iran, between November 2013 and May 2014, agreed on a total of 18 practical measures to be implemented by Iran in three sequential steps as part of an approach to resolve all present and past issues.[17] As of the end of 2014, Iran had implemented 16 of these practical measures; two practical measures related to possible military dimensions, agreed for the third step of the Framework for Cooperation, remained to be implemented. The Agency also invited Iran to propose new practical measures to address the concerns over possible military dimensions, to be implemented in the next step of the Framework for Cooperation. As of 31 December 2014, Iran had not proposed any such measures.

22. Since 20 January 2014, the Agency has undertaken monitoring and verification in relation to the nuclear-related measures set out in the Joint Plan of Action agreed between China, France, Germany, the Russian Federation, the United Kingdom, the United States of America and Iran, the aim of which is to reach a "mutually-agreed, long-term comprehensive solution that would ensure Iran's nuclear programme will be exclusively peaceful". The initial duration of the Joint Plan of Action was six months. On 24 July 2014, the Plan was extended until 24 November 2014, when it was further extended until 30 June 2015. The Agency's work in relation to the Plan has required an approximate doubling of its verification activities compared to those it had already been carrying out pursuant to Iran's safeguards agreement and the relevant resolutions of the Board of Governors and the Security Council.

23. While the Agency continued throughout 2014 to verify the non-diversion of declared nuclear material at the nuclear facilities and LOFs declared by Iran under its safeguards agreement, the Agency was not in a position to provide credible assurance about the absence of undeclared nuclear

[17] The initial six practical measures were agreed on 13 November 2013; another seven practical measures were agreed on 9 February 2014; and a further five practical measures were agreed on 20 May 2014.

material and activities in Iran and, therefore, was unable to conclude that all nuclear material in Iran was in peaceful activities.[18]

Syrian Arab Republic

24. In September 2014, the Director General submitted a report to the Board of Governors titled *Implementation of the NPT Safeguards Agreement in the Syrian Arab Republic* (GOV/2014/44). The Director General informed the Board of Governors that no new information had come to the knowledge of the Agency that would have an impact on the Agency's assessment that it was very likely that a building destroyed at the Dair Alzour site was a nuclear reactor that should have been declared to the Agency by Syria[19]. In 2014, the Director General renewed his call on Syria to cooperate fully with the Agency in connection with unresolved issues related to the Dair Alzour site and other locations. Syria has yet to respond to these calls.

25. In 2014, Syria indicated its readiness to receive Agency inspectors, and to provide support, for the purpose of performing a physical inventory verification (PIV) at the Miniature Neutron Source Reactor in Damascus. The Agency — after considering the United Nations Department of Safety and Security's assessment of the prevailing security level in Syria and the small amount of nuclear material declared by Syria to be at the reactor — decided to postpone the PIV at the reactor until the security level had sufficiently improved. By the end of 2014, the assessment of the security level in Syria had not changed.

26. On the basis of the evaluation of information provided by Syria and other safeguards relevant information available to it, the Agency found no indication of the diversion of declared nuclear material from peaceful activities. For 2014, the Agency concluded for Syria that declared nuclear material remained in peaceful activities.

Overall conclusions for 2014

27. On the basis of the evaluation performed and as reflected in paragraph 2 of the Safeguards Statement, the Secretariat concluded that for the 54 (55) States[20], declared nuclear material remained in peaceful activities. This conclusion was drawn for Algeria, Argentina, the Bahamas, Barbados, Belarus, Belize, Bhutan, Bolivia, Brazil, Brunei Darussalam, Cambodia, Cameroon, Côte d'Ivoire, Dominica, Egypt, Ethiopia, Grenada, Guyana, Honduras, Islamic Republic of Iran, Kiribati, Lao People's Democratic Republic, Lebanon, Liechtenstein, Malaysia, Maldives, Myanmar, Nauru, Nepal, Oman, Papua New Guinea, Qatar, Saint Lucia, Saint Vincent and the Grenadines, Samoa, San Marino, Saudi Arabia, Senegal, Serbia, Sierra Leone, Solomon Islands, Sri Lanka, Sudan, Suriname, Syrian Arab Republic, Thailand, Tonga, Trinidad and Tobago, Tunisia, Tuvalu, Bolivarian Republic of Venezuela, Yemen, Zambia and Zimbabwe.

---

[18] As, for example, Iran did not implement its additional protocol, as required in the relevant binding resolutions of the Board of Governors and the United Nations Security Council.

[19] The Board of Governors, in its resolution GOV/2011/41 of June 2011 (adopted by a vote) had, inter alia, called on Syria to urgently remedy its non-compliance with its NPT safeguards agreement and, in particular, to provide the Agency with updated reporting under its safeguards agreement and access to all information, sites, material and persons necessary for the Agency to verify such reporting and resolve all outstanding questions so that the Agency could provide the necessary assurance as to the exclusively peaceful nature of Syria's nuclear programme.

[20] In addition, this conclusion is drawn for those territories of the Netherlands and New Zealand referred to in footnotes 13 and 14 for which the broader conclusion is not drawn – i.e. the Caribbean part of the Netherlands (the islands of Bonaire, Sint Eustatius and Saba), Aruba, Curaçao and Sint Maarten; and the Cook Islands and Niue, respectively.

B.1.2. States with no safeguards agreements in force

28. As of 31 December 2014, 12 (12) non-nuclear-weapon States party to the NPT had yet to bring comprehensive safeguards agreements into force pursuant to the Treaty.

Overall conclusions for 2014

29. As indicated in paragraph 3 of the Safeguards Statement, the Secretariat could not draw any safeguards conclusions for the following States: Benin, Cabo Verde, Djibouti, Equatorial Guinea, Eritrea, Guinea, Guinea-Bissau, Liberia, Federated States of Micronesia, São Tome and Principe, Somalia and Timor Leste.

B.1.3. States with safeguards agreements based on INFCIRC/66/Rev.2 in force

30. Under safeguards agreements based on INFCIRC/66/Rev.2, the Agency applies safeguards in order to ensure that nuclear material, facilities and other items specified under the safeguards agreement are not used for the manufacture of any nuclear weapon or to further any military purpose, and that such items are used exclusively for peaceful purposes and are not used for the manufacture of any nuclear explosive device.

Status of implementation

31. As of 31 December 2014, safeguards were implemented at facilities in India, Israel and Pakistan pursuant to safeguards agreements based on INFCIRC/66/Rev.2. India brought an additional protocol into force in July 2014.

Deriving conclusions

32. The conclusion described in paragraph 4 of the Safeguards Statement is reported for these three States, and relates to the nuclear material, facilities and other items to which safeguards were applied. To draw such a conclusion in respect of these States, the Agency evaluates all safeguards relevant information available, including verification results and information about facility design features and operations.

Overall conclusions for 2014

33. On the basis of the results of its verification and evaluation activities, the Secretariat concluded that the nuclear material, facilities or other items to which safeguards were applied in India, Israel and Pakistan remained in peaceful activities.

B.1.4. States with both voluntary offer agreements and additional protocols in force

34. Under a voluntary offer agreement, the Agency applies safeguards to nuclear material in those facilities that have been selected by the Agency from the State's list of eligible facilities in order to verify that the material is not withdrawn from peaceful activities except as provided for in the agreement. In selecting facilities under voluntary offer agreements for the application of safeguards, the Agency takes such factors into consideration as: (i) whether the selection of a facility would satisfy legal obligations arising from other agreements concluded by the State; (ii) whether useful experience may be gained in implementing new safeguards approaches or in using advanced equipment and technology; and (iii) whether the cost efficiency of Agency safeguards may be enhanced by applying safeguards, in the exporting State, to nuclear material being shipped to States with comprehensive safeguards agreements in force. By implementing measures under the additional protocol in these five States with voluntary offer agreements, the Agency also seeks to obtain and verify information that

could enhance the safeguards conclusions in States with comprehensive safeguards agreements in force.

Status of implementation

35. During 2014, safeguards were implemented at facilities selected by the Agency in the five States with voluntary offer agreements in force: China, France, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland (United Kingdom) and the United States of America.

Deriving conclusions

36. The conclusion contained in paragraph 5 of the Safeguards Statement is reported for the five States with voluntary offer agreements in force in which safeguards were applied to nuclear material in selected facilities. To draw the safeguards conclusion, the Agency evaluates all safeguards relevant information, including verification results and information about facility design features and operations.

Overall conclusions for 2014

37. On the basis of the results of its verification and evaluation activities, the Secretariat concluded for China, France, the Russian Federation, the United Kingdom and the United States of America that nuclear material to which safeguards had been applied in selected facilities remained in peaceful activities or had been withdrawn as provided for in the agreements. There were no such withdrawals in France and the United Kingdom.

B.2. Democratic People's Republic of Korea

38. In September 2014, the Director General submitted a report to the Board of Governors and General Conference titled *Application of Safeguards in the Democratic People's Republic of Korea* (GOV/2014/42–GC(58)/21), which provided an update of developments since the Director General's report of August 2013.

39. Since 1994, the Agency has not been able to conduct all necessary safeguards activities provided for in the DPRK's NPT safeguards agreement. From the end of 2002 until July 2007, the Agency was not able — and, since April 2009, has not been able — to implement any verification measures in the DPRK and, therefore, could not draw any safeguards conclusion regarding the DPRK.

40. Since April 2009, the Agency has not implemented any measures under the ad hoc monitoring and verification arrangement agreed between the Agency and the DPRK and foreseen in the Initial Actions agreed at the Six-Party Talks. Statements by the DPRK concerning its conducting of a third nuclear test, reiterating its "right" to conduct further nuclear tests, and its intention to readjust and restart its nuclear facilities at Yongbyon, together with its previous statements about uranium enrichment activities and the construction of a light water reactor, are deeply regrettable.

41. No verification activities were implemented in the field in 2014, but the Agency continued to monitor the DPRK's nuclear activities by using open source information (including satellite imagery and trade information). Using satellite imagery, the Agency continued to observe signatures which were consistent with the operation of the 5MW(e) reactor at Yongbyon throughout 2014, and renovation or expansion of other buildings was also seen within the Yongbyon site. However, without access to the site, the Agency cannot confirm the operational status of the reactor or the purpose of the other observed activities. The Agency also continued to further consolidate its knowledge of the DPRK's nuclear programme with the objective of maintaining operational readiness to resume safeguards implementation in the DPRK.

B.3. Areas of difficulty in safeguards implementation

42. Although progress was made during 2014 in addressing some of the areas of difficulty in implementing safeguards, further work remains to be done.

43. The performance and effectiveness of State and regional systems of accounting for and control of nuclear material have significant impacts upon the effectiveness and efficiency of Agency safeguards implementation. In 2014, some States still had not established national systems of accounting for and control of nuclear material, which are required under comprehensive safeguards agreements. Moreover, not all State and regional authorities responsible for safeguards implementation have the necessary authority, resources, technical capabilities or independence from nuclear facility or LOF operators to implement the requirements of safeguards agreements and additional protocols. In particular, some State authorities do not provide sufficient oversight of nuclear material accounting and control systems at nuclear facilities and LOFs to ensure the required accuracy and precision of the data transmitted to the Agency.

44. In accordance with the decision of the Board of Governors in September 2005, States which have not amended or rescinded their SQPs should do so as soon as possible. At the end of 2014, 42 (44) States[21] had operative SQPs that had yet to be amended.

B.4. Strengthening the effectiveness and improving the efficiency of safeguards

45. The Agency has continued to improve the efficiency of safeguards implementation while maintaining or strengthening its effectiveness. This improvement has been essential since the quantities of nuclear material and other items under safeguards and the number of facilities under safeguards have increased (see Fact box 1). In contrast, the Agency's financial resources have not risen commensurately. It should be noted that while a number of facilities are being retired from service, this will not immediately reduce verification effort as safeguards continue to be applied to those facilities until their status is confirmed by the Agency as decommissioned for safeguards purposes.

46. Some of the factors contributing to strengthening the effectiveness and improving the efficiency of safeguards are shown in Fact box 2.

Fact box 2. Strengthening the effectiveness and improving the efficiency of safeguards

In 2014, significant progress was made, as follows:

- During 2014, additional protocols entered into force for India and Saint Kitts and Nevis. At the end of the year, 124 States[2] had additional protocols in force, out of 180 States[1,2] where safeguards were applied.
- Two SQPs[22] were amended in 2014. At the end of 2014, 53 (51) States[23] had SQPs based on the revised standard text, and four States had rescinded their SQPs.

[21] The States with SQPs based on the original text are: Afghanistan, Barbados, Belize, Bhutan, Bolivia, Brunei Darussalam, Cameroon, Dominica, Ethiopia, Fiji, Grenada, Guyana, Haiti, Jordan, Kiribati, Kyrgyzstan, Lao Peoples Democratic Republic, Maldives, Mongolia, Myanmar, Namibia, Nauru, Nepal, Oman, Papua New Guinea, Paraguay, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and Grenadines, Samoa, Saudi Arabia, Sierra Leone, Solomon Islands, Sudan, Suriname, Togo, Tonga, Trinidad and Tobago, Tuvalu, the United Arab Emirates, Yemen and Zambia.

[22] Small quantities protocols were amended by Cambodia and New Zealand.

Fact box 2. Strengthening the effectiveness and improving the efficiency of safeguards

- Strategic planning activities continued, including a technology foresight workshop in Vienna.
- A supplementary document providing clarification and additional information on the State-level concept was submitted to the Board of Governors.
- The Agency continued to better integrate verification activities in the field and at Headquarters with the State evaluation process.
- Further development and testing of internal procedures and guidance were carried out, including guidance on conducting acquisition path analysis and developing State-level safeguards approaches for States with comprehensive safeguards agreements.
- The development and implementation of more effective and efficient safeguards concepts and technology continued for new types of facilities (such as geological repositories, spent fuel encapsulation plants, laser enrichment facilities and pyroprocessing facilities).
- Monitoring, containment and surveillance systems were further improved and deployed.
- Further use was made of short notice and unannounced routine inspections to verify declarations of facility data and operational plans.
- The Agency continued modernizing technologies used for attended measurements, unattended monitoring and the remote transmission of data from such systems.
- The enhancement of information analysis capabilities continued, supported by the collection of open source information (including satellite imagery and information on nuclear related trade), consolidation of State declarations, and advanced evaluation of verification data.
- The Agency continued to make improvements to the structural re-engineering, performance and security of the safeguards information system. By the end of the year, more than half of the major software applications undergoing re-engineering had been completed. Work on defining the scope of the modernization of safeguards information technology (MOSAIC) project, established in 2013, was completed.
- The Agency published the *Safeguards Implementation Guide for States with Small Quantities Protocols* in French and Spanish, held training courses at national, regional and international levels, and conducted three safeguards advisory missions.
- The quality management system continued to be implemented with a focus on knowledge management, performance indicators, cost calculation methodology, and tools to help improve processes, such as quality control reviews, internal audits and condition reports.
- The twelfth *Symposium on International Safeguards* was held in Vienna in October 2014.

47. As a result of these improvements, safeguards have been implemented more effectively while it has been possible to reduce the number of calendar-days spent in the field for verification[6] by 6% over the past five years. While there has been a reduction of inspection effort in the field, the verification and evaluation activities at Headquarters that enabled the reductions have comparably increased. The number of regular staff in the Department of Safeguards has remained approximately constant over the past five years.

48. Member State Support Programmes (MSSPs) and the Standing Advisory Group on Safeguards Implementation (SAGSI) continued to make substantial contributions to Agency safeguards through the provision of assistance and advice, respectively.

---

[23] The States with SQPs based on the revised standard text are: Andorra, Angola, Antigua and Barbuda, Azerbaijan, Bahamas, Bahrain, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Congo, Costa Rica, Croatia, Dominican Republic, Ecuador, El Salvador, Gabon, Gambia, Guatemala, Holy See, Honduras, Iceland, Kenya, Kuwait, Lebanon, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Monaco, Montenegro, Mozambique, New Zealand, Nicaragua, Palau, Panama, Qatar, Republic of Moldova, Rwanda, San Marino, Senegal, Seychelles, Singapore, Swaziland, The former Yugoslav Republic of Macedonia, Uganda, United Republic of Tanzania, Vanuatu and Zimbabwe.

B.5. Safeguards expenditures and resources

49. During 2014, the activities of Major Programme 4 — Nuclear Verification — were funded from various sources — primarily through the Regular Budget and extrabudgetary contributions. The Regular Budget[24] appropriation for 2014 was adjusted to €126.4 (€124.1) million at the average United Nations exchange rate. The extrabudgetary allotments for 2014 were €31.8 million.

50. The expenditures for Major Programme 4 were €124.4 (€122.5) million from the Regular Budget, an increase of 1.5%, over 2013. The Regular Budget utilization rate for 2014 was 98.4% (98.7%) with an unspent balance at the end of the year of €2.0 (€1.6) million. Figure 1 shows the utilization trend of Major Programme 4 for the period 2010–2014.

51. The expenditures from the extrabudgetary contributions were €21.9 (€14.6) million, an increase of 33.3% from 2013. This increase resulted from implementation of the monitoring and verification activities in Iran in relation to the Joint Plan of Action which commenced in 2014.

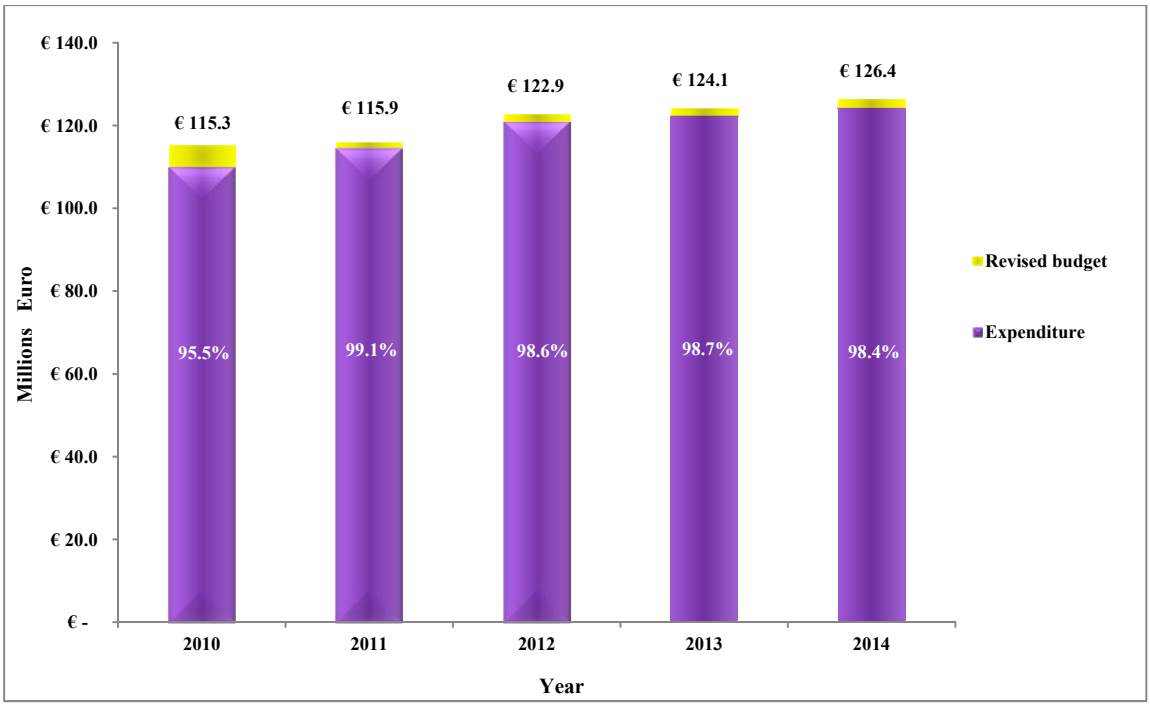

Figure 1. Major Programme 4 — Nuclear Verification — budget and expenditures, 2010–2014

B.6. Further activities supporting the nuclear non-proliferation regime

52. During 2014, the monitoring scheme approved by the Board of Governors in 1999 regarding separated neptunium and americium continued. The Agency received information from eight States[2, 25] and the European Commission about separated neptunium or americium. A facility in Germany continued to be subject to flow sheet verification. By the end of 2014, evaluation of the information that had been obtained under the monitoring scheme and from open sources and other sources had not indicated any issue of proliferation concern.

---

[24] €131.0 million (at an exchange rate €1=$1).

[25] Czech Republic, France, Japan, Republic of Korea, Norway, Pakistan, United Kingdom and United States of America.

B.7. Status of safeguards agreements (as of 31 December 2014)

53. This section contains information — presented in the five tables below that conform with the structure of the Safeguards Statement — on safeguards agreements that provide the basis for the Agency's implementation of safeguards in 2014. It does not include agreements under which the application of safeguards has been suspended in the light of implementation of safeguards pursuant to another agreement. For full details see the Agency's website:

http://www.iaea.org/OurWork/SV/Safeguards/documents/sir_table.pdf.

Table 1 – States with comprehensive safeguards agreements and additional protocols in force

State	SQP	INFCIRC	Additional protocol (date of entry into force)	Broader conclusion drawn	Integrated safeguards implemented
Afghanistan	X	257	19 July 2005		
Albania		359	03 November 2010	X	
Andorra	X A)	808	19 December 2011	X	
Angola	X(A)	800	28 April 2010		
Antigua and Barbuda	X(A)	528	15 November 2013		
Armenia		455	28 June 2004	X	X
Australia		217	12 December 1997	X	X
Austria		193	30 April 2004	X	X
Azerbaijan	X(A)	580	29 November 2000		
Bahrain	X(A)	767	20 July 2011		
Bangladesh		301	30 March 2001	X	X
Belgium		193	30 April 2004	X	X
Bosnia and Herzegovina		851	03 July 2013		
Botswana		694	24 August 2006	X	
Bulgaria[(1)]		193	01 May 2009	X	X
Burkina Faso	X(A)	618	17 April 2003	X	X
Burundi	X(A)	719	27 September 2007		
Canada		164	08 September 2000	X	X
Central African Republic	X(A)	777	07 September 2009		
Chad	X(A)	802	13 May 2010		
Chile		476	03 November 2003	X	X
Colombia		306	05 March 2009		
Comoros	X(A)	752	20 January 2009		
Congo	X(A)	831	28 October 2011		
Costa Rica	X(A)	278	17 June 2011		
Croatia	X(A)	463	06 July 2000	X	X
Cuba		633	03 June 2004	X	X
Cyprus[(1)]		193	01 May 2008		
Czech Republic[(1)]		193	01 October 2009	X	X
Democratic Republic of the Congo		183	09 April 2003		
Denmark[(2)]		193 176	30 April 2004 22 March 2013	X	X
Dominican Republic	X(A)	201	05 May 2010		
Ecuador	X(A)	231	24 October 2001	X	X
El Salvador	X(A)	232	24 May 2004		
Estonia[(1)]		193	01 December 2005	X	X
Fiji	X	192	14 July 2006		
Finland		193	30 April 2004	X	X
Gabon	X (A)	792	25 March 2010		
Gambia	X(A)	277	18 October 2011		

State	SQP	INFCIRC	Additional protocol (date of entry into force)	Broader conclusion drawn	Integrated safeguards implemented
Georgia		617	03 June 2003		
Germany		193	30 April 2004	X	X
Ghana		226	11 June 2004	X	X
Greece		193	30 April 2004	X	X
Guatemala	X(A)	299	28 May 2008		
Haiti	X	681	09 March 2006		
Holy See	X(A)	187	24 September 1998	X	X
Hungary[(1)]		193	01 July 2007	X	X
Iceland	X(A)	215	12 September 2003	X	X
Indonesia		283	29 September 1999	X	X
Iraq		172	10 October 2012		
Ireland		193	30 April 2004	X	X
Italy		193	30 April 2004	X	X
Jamaica		265	19 March 2003	X	X
Japan		255	16 December 1999	X	X
Jordan	X	258	28 July 1998	X	
Kazakhstan		504	09 May 2007	X	
Kenya	X(A)	778	18 September 2009		
Korea, Republic of		236	19 February 2004	X	X
Kuwait	X(A)	607	02 June 2003	X	
Kyrgyzstan	X	629	10 November 2011		
Latvia[(1)]		193	01 October 2008	X	X
Lesotho	X(A)	199	26 April 2010		
Libya		282	11 August 2006	X	X
Lithuania[(1)]		193	01 January 2008	X	X
Luxembourg		193	30 April 2004	X	X
Madagascar	X(A)	200	18 September 2003	X	X
Malawi	X(A)	409	26 July 2007		
Mali	X(A)	615	12 September 2002	X	X
Malta[(1)]		193	01 July 2007	X	X
Marshall Islands		653	03 May 2005		
Mauritania	X(A)	788	10 December 2009		
Mauritius	X(A)	190	17 December 2007	X	
Mexico		197	04 March 2011		
Moldova, Republic of	X(A)	690	01 June 2012		
Monaco	X(A)	524	30 September 1999	X	X
Mongolia	X	188	12 May 2003		
Montenegro	X(A)	814	04 March 2011		
Morocco		228	21 April 2011		
Mozambique	X(A)	813	01 March 2011		
Namibia	X	551	20 February 2012		
Netherlands[(3)]		193	30 April 2004	X	X
New Zealand[(4)]	X(A)	185	24 September 1998	X	
Nicaragua	X(A)	246	18 February 2005		
Niger		664	02 May 2007		
Nigeria		358	04 April 2007		
Norway		177	16 May 2000	X	X
Palau	X(A)	650	13 May 2005	X	X
Panama	X(A)	316	11 December 2001		
Paraguay	X	279	15 September 2004		
Peru		273	23 July 2001	X	X
Philippines		216	26 February 2010	X	
Poland[(1)]		193	01 March 2007	X	X
Portugal		193	30 April 2004	X	X

State	SQP	INFCIRC	Additional protocol (date of entry into force)	Broader conclusion drawn	Integrated safeguards implemented
Romania[(1)]		193	01 May 2010	X	X
Rwanda	X(A)	801	17 May 2010		
Saint Kitts and Nevis	X	514	19 May 2014		
Seychelles	X(A)	635	13 October 2004	X	X
Singapore	X(A)	259	31 March 2008	X	X
Slovakia[(1)]		193	01 December 2005	X	X
Slovenia[(1)]		193	01 September 2006	X	X
South Africa		394	13 September 2002	X	
Spain		193	30 April 2004	X	X
Swaziland	X(A)	227	08 September 2010		
Sweden		193	30 April 2004	X	X
Switzerland		264	01 February 2005		
Tajikistan		639	14 December 2004		
The former Yugoslav Republic of Macedonia	X(A)	610	11 May 2007	X	X
Togo	X	840	18 July 2012		
Turkey		295	17 July 2001	X	
Turkmenistan		673	03 January 2006		
Uganda	X(A)	674	14 February 2006		
Ukraine		550	24 January 2006	X	X
United Arab Emirates	X	622	20 December 2010		
United Republic of Tanzania	X(A)	643	07 February 2005		
Uruguay		157	30 April 2004	X	X
Uzbekistan		508	21 December 1998	X	X
Vanuatu	X(A)	852	21 May 2013		
Viet Nam		376	17 September 2012	X	

General Notes:

- In addition, safeguards, including the measures of the Model Additional Protocol, were applied for Taiwan, China. The broader conclusion was drawn for Taiwan, China, in 2006 and integrated safeguards were implemented from 1 January 2008.
- The safeguards agreement reproduced in INFCIRC/193 is that concluded between the non-nuclear-weapon States of the European Atomic Energy Community (EURATOM), EURATOM and the Agency.
- 'X' in the 'SQP' column indicates that the State has an operative SQP. 'X(A)' indicates that the SQP in force is based on the revised SQP standard text (see Section B, paragraph 6).
- 'X' in the 'broader conclusion drawn' column indicates that the broader conclusion has been drawn as described in Section B, paragraph 13.
- 'X" in the 'integrated safeguards implemented' column indicates that integrated safeguards were implemented for the whole of the year.

Footnotes:

(1) The date refers to accession to INFCIRC/193 and INFCIRC/193/Add.8.

(2) The application of safeguards in Denmark under the bilateral NPT safeguards agreement (INFCIRC/176), in force since 1 March 1972, was suspended on 21 February 1977, on which date the Safeguards Agreement between the non-nuclear-weapon States of EURATOM, EURATOM and the Agency (INFCIRC/193) entered into force for Denmark. Since 21 February 1977, INFCIRC/193 also applies to the Faroe Islands. Upon Greenland's secession from EURATOM as of 31 January 1985, the Agreement between the Agency and Denmark (INFCIRC/176) re-entered into force for Greenland. The additional protocol to this agreement entered into force on 22 March 2013 (INFCIRC/176/Add.1).

(3) The safeguards agreement reproduced in INFCIRC/229 with regard to the Caribbean part of the Netherlands (the islands of Bonaire, Sint Eustatius, and Saba), Aruba, Curacao and Sint Maarten is pursuant to the NPT and Additional Protocol I to the Treaty of Tlatelolco. There is a SQP to this agreement. No additional protocol is in force for that agreement.

(4) The safeguards agreement reproduced in INFCIRC/185 is applicable to the Cook Islands and Niue. The additional protocol reproduced in INFCIRC/185/Add. 1; however, is not applicable to the Cook Islands and Niue.

Table 2 – States with comprehensive safeguards agreements but no additional protocols in force

State	SQP	INFCIRC	Additional protocol
Algeria		531	Approved: 14 September 2004
Argentina		435	
Bahamas	X(A)	544	
Barbados	X	527	
Belarus		495	Signed: 15 November 2005
Belize	X	532	
Bhutan	X	371	
Bolivia	X	465	
Brazil		435	
Brunei Darussalam	X	365	
Cambodia	X(A)	586	Approved: 03 June 2014
Cameroon	X	641	Signed: 16 December 2004
Côte d'Ivoire		309	Signed: 22 October 2008
Democratic People's Republic of Korea[(1)]		403	
Dominica	X	513	
Egypt		302	
Ethiopia	X	261	
Grenada	X	525	
Guyana	X	543	
Honduras	X(A)	235	Signed: 07 July 2005
Iran, Islamic Republic of[(2)]		214	Signed: 18 December 2003
Kiribati	X	390	Signed: 09 November 2004
Lao People's Democratic Republic	X	599	Signed: 05 November 2014
Lebanon	X(A)	191	
Liechtenstein		275	Signed: 14 July 2006
Malaysia		182	Signed: 22 November 2005
Maldives	X	253	
Myanmar	X	477	Signed: 17 September 2013
Nauru	X	317	
Nepal	X	186	
Oman	X	691	
Papua New Guinea	X	312	
Qatar	X(A)	747	
Saint Lucia	X	379	
Saint Vincent and the Grenadines	X	400	
Samoa	X	268	
San Marino	X(A)	575	
Saudi Arabia	X	746	
Senegal	X(A)	276	Signed: 15 December 2006
Serbia		204	Signed: 03 July 2009
Sierra Leone	X	787	
Solomon Islands	X	420	
Sri Lanka		320	
Sudan	X	245	
Suriname	X	269	
Syrian Arab Republic		407	
Thailand		241	Signed: 22 September 2005
Tonga	X	426	
Trinidad and Tobago	X	414	
Tunisia		381	Signed: 24 May 2005
Tuvalu	X	391	
Venezuela, Bolivarian Republic of		300	

State	SQP	INFCIRC	Additional protocol
Yemen	X	614	
Zambia	X	456	Signed: 13 May 2009
Zimbabwe	X(A)	483	

General Notes:
- The safeguards agreement reproduced in INFCIRC/435 is that concluded between Argentina, Brazil, the Brazilian-Argentine Agency for Accounting and Control of Nuclear Material (ABACC) and the Agency.
- 'X' in the 'SQP' column indicates that the State has an operative SQP. 'X(A)' indicates that the SQP in force is based on the revised SQP standard text (see Section B, paragraph 6).

Footnotes:
(1) In a letter to the Director General dated 10 January 2003, the DPRK stated that the Government had "decided to lift the moratorium on the effectiveness of its withdrawal from the Treaty on the Non-Proliferation of Nuclear Weapons" and that "its decision to withdraw from the Treaty will come into effect from 11 January 2003 onwards."
(2) Iran provisionally implemented its additional protocol between December 2003 and February 2006.

Table 3 – States party to the NPT without comprehensive safeguards agreements in force

State	SQP	Safeguards agreement	Additional protocol
Benin	X(A)	Signed: 07 June 2005	Signed: 07 June 2005
Cabo Verde	X(A)	Signed: 28 June 2005	Signed: 28 June 2005
Djibouti	X(A)	Signed: 27 May 2010	Signed: 27 May 2010
Equatorial Guinea	X	Approved: 13 June 1986	
Eritrea			
Guinea	X(A)	Signed: 13 December 2011	Signed: 13 December 2011
Guinea-Bissau	X(A)	Signed: 21 June 2013	Signed: 21 June 2013
Liberia			
Micronesia, Federated States of			
São Tome and Principe			
Somalia			
Timor-Leste	X(A)	Signed: 06 October 2009	Signed: 06 October 2009

General Note:
- 'X' in the 'SQP' column indicates that the State has an SQP. 'X(A)' indicates that the SQP is based on the revised SQP standard text (see Section B, paragraph 6). In both cases the SQP will come into force at the same time as the safeguards agreement.

Table 4 – States with safeguards agreements based on INFCIRC/66/Rev.2 in force

State	INFCIRC	Additional protocol
India	211 260 360 374 433 754	In force: 25 July 2014
Israel	249/Add.1	
Pakistan	34 116 135 239 248 393 418 705 816	

Table 5 – States with voluntary offer agreements and additional protocols in force

State	INFCIRC	Additional protocol
China	369	In force: 28 March 2002
France[(1)]	290	In force: 30 April 2004
Russian Federation	327	In force: 16 October 2007
United Kingdom of Great Britain and Northern Ireland[(2), (3)]	263	In force: 30 April 2004
United States of America[(4)]	288	In force: 06 January 2009

Footnotes:

(1) The safeguards agreement reproduced in INFCIRC/718 between France, EURATOM and the Agency is pursuant to Additional Protocol I to the Treaty of Tlatelolco. There is an SQP to this agreement. No additional protocol to that agreement has been concluded.

(2) The safeguards agreement reproduced in INFCIRC/175, which remains in force, is an INFCIRC/66/Rev.2-type safeguards agreement, concluded between the United Kingdom and the Agency.

(3) The safeguards agreement between the United Kingdom, EURATOM and the Agency pursuant to Additional Protocol I to the Treaty of Tlatelolco was signed but has not entered into force. There is an SQP to this agreement. No additional protocol to that agreement has been concluded.

(4) The safeguards agreement reproduced in INFCIRC/366 between the United States of America and the Agency is pursuant to Additional Protocol I to the Treaty of Tlatelolco. There is an SQP to this agreement. No additional protocol to that agreement has been concluded.

C. Safeguards Implementation

54. This section presents the results[26] of safeguards implementation for 2014 for States[2] with safeguards agreements in force. The results are summarized for each group of States described in the Safeguards Statement. Further data regarding verification activities and results are presented in Appendices I and II.

55. An evaluation of the implementation of safeguards was performed for each State with a safeguards agreement in force:

- States with both comprehensive safeguards agreements and additional protocols in force:
  - States with the broader conclusion in which integrated safeguards were implemented for the whole year;
  - States with the broader conclusion in which integrated safeguards were not implemented during the year; and
  - States with both comprehensive safeguards agreements and additional protocols in force, with the broader conclusion not yet drawn;
- States with comprehensive safeguards agreements in force but without additional protocols in force;
- States with safeguards agreements based on INFCIRC/66/Rev.2 in force; and
- States with both voluntary offer agreements and additional protocols in force.

56. Analysis of these results leads to the identification of any implementation problems for individual States and the formulation of action plans to resolve them. Generic problems are addressed in Section D.

57. Key to the process by which safeguards conclusions are drawn is the State evaluation process. During the year, State evaluations for 180 (180) States[2] were completed and reviewed.[27]

C.1. States with both comprehensive safeguards agreements and additional protocols in force

58. Only for a State with both a comprehensive safeguards agreement and an additional protocol in force, when all the necessary evaluations have been completed, does the Agency draw the broader conclusion that all nuclear material in the State has remained in peaceful activities. After drawing the broader conclusion for a State, and when the necessary arrangements have been completed, the Agency implements integrated safeguards under which — due to increased assurance of the absence of undeclared nuclear material and activities for the State as a whole — the intensity of inspection activities at declared facilities and LOFs can be reduced.

---

[26] Results for the DPRK are not included as the Agency did not implement safeguards in the DPRK.

[27] Completion of the process of reviewing the State evaluation reports extends into the first three months of the following year. The number of States shows, therefore, the total for the twelve-month period running from April 2014 to March 2015.

59. Where integrated safeguards are implemented, the Agency establishes technical objectives for specific locations, or groups of locations, according to the nuclear material or activity involved. The technical objectives form the basis of the State-level safeguards approach. The verification measures and activities necessary to meet these objectives are also defined in the State-level safeguards approach and annual implementation plans. Where integrated safeguards are not implemented, the inspection activities to be performed in the field are based on the Agency's Safeguards Criteria.

60. As reported in paragraph 1 of the Safeguards Statement, 118 States had both comprehensive safeguards agreements and additional protocols in force. As reported in paragraph 1(a) of the Safeguards Statement, the Secretariat was able to draw the broader conclusion for 65[28] of the 118 States[2] that all nuclear material remained in peaceful activities. The results of safeguards implementation for these 65 States[2] are subdivided below into two categories: 53 States[2, 29], where integrated safeguards were implemented for the whole year; and 12 States[30] where integrated safeguards were not implemented in 2014.

C.1.1. States with the broader conclusion in which integrated safeguards were implemented throughout 2014

61. Integrated safeguards were implemented during the whole of 2014 for 53 States[2] with the broader conclusion (see Appendix II, Group 1). Safeguards implementation activities were carried out for these States in accordance with the State-level safeguards approach and annual implementation plan for each individual State.

62. The amounts of nuclear material under safeguards, the number of facilities and MBAs containing LOFs under safeguards, the safeguards activities undertaken during the year, the verification effort and data on the submission of accounting reports and additional protocol declarations are presented for each State in Appendix II, Tables II.1–3.

63. Having evaluated the results of safeguards activities and all other available safeguards relevant information for each of these States, the Secretariat found that there was no indication of diversion of declared nuclear material from peaceful nuclear activities and no indication of undeclared nuclear material and activities in these States[2]. On this basis, the Secretariat concluded that, for these States, all nuclear material remained in peaceful activities.

Fact box 3. States in which integrated safeguards were implemented throughout 2014

In this group of 53 States[2]:

- there were 514 (515) facilities and 469 (473) MBAs containing LOFs, which represent 73% (74%) of the facilities and 83% (84%) of the MBAs containing LOFs under Agency safeguards.

---

[28] In 2014, one planned in-field verification activity was not conducted at the IR-100 research reactor and subcritical uranium-water assembly located at the Sevastopol National University of Nuclear Energy and Industry of Ukraine, where declared nuclear material was located. Nevertheless, based on the evaluation of all safeguards relevant information for Ukraine in 2014, including safeguards relevant communications from Ukraine, the Agency did not find any indication that, in its judgment, gave rise to a proliferation concern. Consequently, the Secretariat was able to draw the broader conclusion for Ukraine that all nuclear material remained in peaceful activities.

[29] Integrated safeguards were implemented only in that part of Denmark which is covered by INFCIRC/193 and INFCIRC/193/Add. 8, i.e. Denmark and the Faroe Islands, which excludes Greenland.

[30] Albania, Andorra, Botswana, Jordan, Kazakhstan, Kuwait, Mauritius, New Zealand, Philippines, South Africa, Turkey and Viet Nam.

Fact box 3. States in which integrated safeguards were implemented throughout 2014

- the total amount of nuclear material under Agency safeguards was 148 122 (144 287) significant quantities, which represents 77% (77%) of nuclear material (by significant quantity) under Agency safeguards.
- a total of approximately 1 tonne of heavy water was under Agency safeguards.
- the Agency carried out 1305 (1294) inspections, 322 (346) design information verifications and 59 (48) complementary accesses utilizing 6963.5 (6883) calendar-days in the field for verification, which represents 56% (58%) of the Agency's verification effort in the field.
- the estimated cost[31] of safeguards for the group was €62 (€58.4) million, which represents 53% (55%) of the total cost of Agency safeguards allocated by State.
- implementation of integrated safeguards has resulted in total reductions of approximately 2000 (2000) person days of inspection per year.[32]

Japan

64. Notable progress was made during 2014 at the Fukushima Daiichi site with the opening of the core of Unit 5 for re-verification and the transfer of all fuel assemblies from the spent fuel pond of Unit 4 to other storage locations on the Fukushima Daiichi site where this nuclear material was successfully re-verified by the Agency. As of the end of 2014, the Agency has been able to re-verify approximately 80% of the nuclear material which was on site at the time of the accident, an increase of 10% over the previous year. Nuclear material inaccessible for verification remains only at three damaged reactors (Units 1–3). Removal and re-verification of fuel assemblies in the ponds of these units are expected to continue for several years with removal of core debris to follow. As clean-up and decommissioning activities on the site progress, safeguards measures are being applied to ensure that nuclear material cannot be removed from the site without the Agency's knowledge.

Uzbekistan

65. The majority of the issues reported in the Safeguards Implementation Report for 2013 regarding failure by Uzbekistan to report small amounts of nuclear material and some small-scale nuclear activities have been satisfactorily addressed by the State. The Agency continues to work with Uzbekistan to complete the remaining actions.

C.1.2. States with the broader conclusion in which integrated safeguards were not implemented during 2014

66. There are 12 (ten) States in this group. Safeguards activities at declared facilities and LOFs of the group were based on the Agency's Safeguards Criteria.

67. The amounts of nuclear material under safeguards, the number of facilities and MBAs containing LOFs under safeguards, the safeguards activities undertaken during the year, the verification effort and data on the submission of accounting reports and additional protocol declarations are presented for each State in Appendix II, Tables II.4–6.

---

[31] See Section F.1.3.

[32] The savings are estimated for each State as the difference in person-days of inspection between the year 2014 and the last year without integrated safeguards.

Fact box 4. States in which integrated safeguards were not implemented during 2014

In this group of 12 States:

- there were 38 (22) facilities and 13 (13) MBAs containing LOFs, which represent 5% of the facilities and 2% of the MBAs containing LOFs under Agency safeguards.
- the total amount of nuclear material under Agency safeguards was 2290 (1562) significant quantities, which represents 1% of nuclear material (by significant quantity) under Agency safeguards.
- the Agency carried out 107 (86) inspections, 32 (23) design information verifications and 11 complementary accesses utilizing 784.5 (443) calendar-days in the field for verification, which represents 6% of the Agency's verification effort in the field.
- the estimated cost of safeguards for the group was €7.1 (€4.8) million, which represents 6% of the total cost of Agency safeguards allocated by State.

68. Having evaluated the results of safeguards activities and all other available safeguards relevant information for each of these States, the Secretariat found that there was no indication of diversion of declared nuclear material from peaceful nuclear activities and no indication of undeclared nuclear material and activities in these States. On this basis, the Secretariat concluded that, for these States, all nuclear material remained in peaceful activities. For Kazakhstan and Viet Nam, this conclusion was drawn for the first time.

C.1.3. States without the broader conclusion

69. There were 53 (54) States with both comprehensive safeguards agreements and additional protocols in force for which the Secretariat had not yet drawn a broader conclusion.

70. The amounts of nuclear material under safeguards, the number of facilities and MBAs containing LOFs under safeguards, the safeguards activities undertaken during the year, the verification effort and data on the submission of accounting reports and additional protocol declarations are presented for each State in Appendix II, Tables II.7–9.

Fact box 5. States with both comprehensive safeguards agreements and additional protocols in force, with the broader conclusion not yet drawn

In this group of 53 States:

- there were 26 (39) facilities and 42 (42) MBAs containing LOFs, which represent 4% of the facilities and 7% of the MBAs containing LOFs under Agency safeguards.
- the total amount of nuclear material under Agency safeguards was 3748 (4317) significant quantities which represents 2% of nuclear material (by significant quantity) under Agency safeguards.
- the Agency carried out 69 (103) inspections, 25 (31) design information verifications and 8 (18) complementary accesses utilizing 287.5 (754) calendar-days in the field for verification, which represents 2% of the Agency's verification effort in the field.
- the estimated cost of safeguards for the group was €6.1 (€8.9) million, which represents 5% of the total cost of Agency safeguards allocated by State.

71. Attaining a broader conclusion involves activities by both the State and the Agency that may include legal and administrative aspects. The States should provide all the required nuclear material accounting and additional protocol information and respond to Agency requests seeking to resolve

questions or inconsistencies. The Agency continues to work with these States to obtain the necessary information, to resolve inconsistencies in the information, to resolve safeguards relevant questions regarding their nuclear activities and to complete the evaluations for each of the States.

72. Having evaluated the results of safeguards activities and all other available safeguards relevant information for each of these States, the Secretariat found that there was no indication of diversion of declared nuclear material from peaceful nuclear activities in these States. Evaluations regarding the absence of undeclared nuclear material and activities for each of these States remained ongoing. On this basis, the Secretariat concluded that, for these States, declared nuclear material remained in peaceful activities.

C.2. States with comprehensive safeguards agreements in force but without additional protocols in force

73. As reported in paragraph 2 of the Safeguards Statement, safeguards were applied[1] for 54 (55) States with comprehensive safeguards agreements but without additional protocols in force.

74. The amounts of nuclear material under safeguards, the number of facilities and MBAs containing LOFs under safeguards, the safeguards activities undertaken during the year and the verification effort and data on the submission of accounting reports are presented for each State in Appendix II, Tables II.10–12.

75. Having evaluated the results of safeguards activities and all other available safeguards relevant information for each of these States, the Secretariat found that there was no indication of the diversion of declared nuclear material from peaceful nuclear activities in these States. On this basis, the Secretariat concluded that, for these States, declared nuclear material remained in peaceful activities.

Fact box 6. States with comprehensive safeguards agreements in force but without additional protocols in force

In this group of 54 States:

- there were 96 (94) facilities and 34 (33) MBAs containing LOFs, which represent 14% of the facilities and 6% of the MBAs containing LOFs under Agency safeguards.
- the total amount of nuclear material under Agency safeguards was 3594 (3416) significant quantities, which represents 2% of nuclear material (by significant quantity) under Agency safeguards.
- the Agency carried out 489 (334) inspections and 210 (144) design information verifications utilizing 3257.5 (2326) calendar-days in the field for verification, which represents 26% (20%) of the Agency's verification effort in the field.
- the estimated cost of safeguards for the group was €22.5 (€22.5) million, which represents 20% of the total cost of Agency safeguards allocated by State. The estimated cost of safeguards for Iran was €12.5 million, which represents 11% of the total cost of Agency safeguards allocated by State.

C.3. States with safeguards agreements based on INFCIRC/66/Rev.2 in force

76. As reported in paragraph 4 of the Safeguards Statement, India, Israel and Pakistan have safeguards agreements based on INFCIRC/66/Rev.2. India brought into force an additional protocol in July 2014.

77. The amounts of nuclear material and heavy water under safeguards, the number of facilities and MBAs containing LOFs under safeguards, the safeguards activities undertaken during the year, the verification effort and data on the submission of accounting reports are presented for each State in Appendix II, Tables II.13–15.

Fact box 7. States with safeguards agreements based on INFCIRC/66/Rev.2 in force

In this group of three States:

- there were 19 (18) facilities and one MBA containing LOFs under Agency safeguards.
- the total amount of nuclear material under Agency safeguards was 3037 (2917) significant quantities, which represents <2% of nuclear material (by significant quantity) under Agency safeguards.
- a total of 431 (430) tonnes of heavy water was under Agency safeguards.
- the Agency carried out 64 (64) inspections and 19 (18) design information verifications utilizing 663.5 (636) calendar-days in the field for verification, which represents 5% of the Agency's verification effort in the field.
- the estimated cost of safeguards for the group was €4.1 (€3.9) million, which represents 4% of the total cost of Agency safeguards allocated by State.

78. Having evaluated the results of safeguards activities and all other safeguards relevant information available to it for each of these States, the Secretariat found that there was no indication of diversion of nuclear material or of the misuse of the facilities or other items to which safeguards had been applied in these States. On this basis, the Secretariat concluded that, for these States, nuclear

material, nuclear facilities or other items to which safeguards had been applied remained in peaceful activities.

C.4. States with both voluntary offer agreements and additional protocols in force

79. As reported in paragraph 5 of the Safeguards Statement, there were five nuclear-weapon States with voluntary offer agreements and additional protocols in force.

80. The amounts of nuclear material under safeguards, the number of facilities under safeguards, the safeguards activities undertaken during the year, the verification effort and data on the submission of accounting reports and additional protocol declarations are presented for each State in Appendix II, Tables II.16–18.

81. Having evaluated the results of safeguards activities and all other safeguards relevant information available to it for each of these States, the Secretariat found that there was no indication of the diversion of nuclear material to which safeguards had been applied. On this basis, the Secretariat concluded that, for the five States, nuclear material to which safeguards had been applied in selected facilities, or parts thereof, remained in peaceful activities or was withdrawn from safeguards as provided for in the agreements. There were no such withdrawals from the selected facilities in France and the United Kingdom.

Fact box 8. States with both voluntary offer agreements and additional protocols in force

In this group of five States:

- the total number of facilities on the States' lists of eligible facilities was 424 (436); from these, 11 (11) facilities, or parts thereof, were selected for the application of Agency safeguards.
- the total amount of nuclear material under Agency safeguards was 32 676 (32 001) significant quantities, which represents 17% of nuclear material (by significant quantity) under Agency safeguards, including 10 343 (10 604) significant quantities of unirradiated plutonium.
- the Agency carried out 78 (85) inspections and 10 (10) design information verifications utilizing 775.5 (721) calendar-days in the field for verification, which represents 6% of the Agency's verification effort in the field.
- the estimated cost of safeguards for the group was €7.3 (€7.3) million[33], which represents 7% of the total cost of Agency safeguards allocated by State.

C.5. States with no safeguards agreements in force

82. As reported in paragraph 3 of the Safeguards Statement, the Secretariat could not draw any safeguards conclusions for the 12 non-nuclear-weapon States party to the NPT which, at the end of 2014, had yet to bring comprehensive safeguards agreements into force pursuant to the Treaty. Six (six) of these States have signed comprehensive safeguards agreements and additional protocols.

[33] Includes safeguards implementation costs covered by extrabudgetary contributions.

D. Areas of Difficulty in Safeguards Implementation

83. This section describes progress in addressing the problems in the implementation of safeguards during 2014.

D.1. Safeguards implementation in States with small quantities protocols

84. As called on by the Board of Governors in September 2005, States which have not amended or rescinded their SQPs should respond to the Agency's proposal and either amend or rescind, as appropriate, their SQPs as soon as possible. At the end of 2014, 42 (44) States had operative SQPs that had yet to be amended.

85. The actions undertaken by the Agency under the *Plan of Action to Promote the Conclusion of Safeguards Agreements and Additional Protocols*, are provided in Section E.1.

D.2. Effectiveness of systems of accounting for and control of nuclear material

86. The performance of State and regional authorities and the effectiveness of the respective systems of accounting for and control of nuclear material have a significant impact upon the effectiveness and efficiency of safeguards implementation. In 2014, in some States, national systems of accounting for and control of nuclear material or authorities responsible for safeguards had yet to be established. Moreover, not all State and regional authorities responsible for safeguards implementation have the necessary authority, independence from operators, resources or technical capabilities to implement the requirements of safeguards agreements and additional protocols. In particular, some State authorities do not provide sufficient oversight of nuclear material accounting and control systems at nuclear facilities and LOFs to ensure the required accuracy and precision of the data transmitted to the Agency.

87. Problems continued during 2014 with regard to a number of issues, including provision of visas, designation of inspectors, timeliness and accuracy of reporting, inclusion of specific nuclear material in inventory reports, provision of access, and agreement to apply required safeguards measures.

88. Complete, accurate and timely provision of safeguards relevant reports and other relevant information by States is also critical for effective and efficient safeguards implementation. Safeguards effectiveness was affected in several States that did not provide, for example, design information in accordance with modified Code 3.1 of their Subsidiary Arrangements General Part, or advance notification of nuclear material receipts and transfers.

89. For Agency inspectors to conduct their verification activities effectively, they must be able to access installations and perform the verification activities within agreed timeframes. Several States delayed access of Agency inspectors to a facility or a LOF for inspection activities; limited inspector activities; limited or did not permit environmental sampling; or did not provide the necessary access as requested by the Agency, including access for the Agency to verify design information in areas of facilities not containing nuclear material or to locations at which the Agency considered that access was required to ensure the absence of undeclared nuclear material or activities. In addition, some States delayed shipment of destructive analysis samples, thus preventing their timely analysis for drawing safeguards conclusions.

Fact box 9. Timeliness of reports and declarations

For 2014, for States with safeguards agreements in force:

- as of 1 March 2015, the following reports which were due with regard to 2014 had yet to be provided to the Agency:[34]
  - 13 (17) initial inventory reports from States with SQPs based on the revised standard text; and
  - 38 (88) physical inventory listings (PILs) and material balance reports (MBRs) from 11 (13) States.
- for 10 (11) States, more than 20% of PILs, MBRs or inventory change reports (ICRs) were dispatched with a delay greater than 40 days.
- 20 (22) States with additional protocols in force did not submit any additional protocol declarations, of which 17 (18) States have not yet submitted their initial declarations.
- for 22 (20) States, more than 20% of their additional protocol declarations were dispatched with a delay greater than 40 days.

90. Bulk material measurements by the nuclear facility operators generally met the international target values[35]; however, the measurements of nuclear material in some facilities showed evidence of bias and/or poor measurement quality and, as a consequence, the material balance evaluations at these facilities showed large and/or statistically significant values for material unaccounted for, difference statistic, and shipper-receiver differences and/or bias in the trends for these material balance statistics.

91. The Agency's ability to resolve questions, inconsistencies, discrepancies and anomalies depends on States' cooperation in responding to Agency requests for additional information or for access to resolve such issues. Delays in resolving issues can result in the Agency being unable to attain the safeguards technical objectives. The effort to resolve questions, inconsistencies, discrepancies, and anomalies results in greater use of Agency and State resources. Several States did not sufficiently facilitate the clarification or resolution of Agency questions, including questions concerning the correctness/completeness of their declarations.

92. The Agency is addressing the above issues with State or regional authorities, as appropriate. Also, the Agency is providing assistance to State and regional authorities as discussed in Section E.5.

D.3. Security concerns

93. The security level in various States was a concern to the Agency in view of the impact on the Agency's ability to perform planned in-field verification activities in those States. Therefore, the United Nations Department of Safety and Security's assessment of the prevailing security level in such States — considering the security of its staff — served as a guide for all official travel, including travel in connection with Agency in-field verification activities.

[34] The outstanding PILs and MBRs were typically for MBAs containing LOFs.

[35] http://www.iaea.org/safeguards/documents/International_Target_Values_2010.pdf

E. Strengthening the Effectiveness and Improving the Efficiency of Safeguards

E.1. Conclusion of safeguards agreements and additional protocols

94. The Agency continued to implement the *Plan of Action to Promote the Conclusion of Safeguards Agreements and Additional Protocols*[36], which was updated in September 2014. The Agency organized national events on safeguards for Brunei Darussalam in June 2014, and for Myanmar in December 2014, at which the Agency encouraged these States to conclude additional protocols and to amend their SQPs. In addition, consultations on the conclusion of safeguards agreements and additional protocols were held with representatives from various States throughout the year in Geneva, New York and Vienna, and also during training events organized in Vienna and elsewhere by the Agency. During the year, India and Saint Kitts and Nevis brought additional protocols into force. In addition, the Lao People's Democratic Republic signed an additional protocol, and an additional protocol for Cambodia was approved by the Board of Governors.

95. The Agency also continued to communicate with States in order to implement the Board's 2005 decisions regarding SQPs, with a view to amending or rescinding such protocols to reflect the revised standard text. During the year, operative SQPs were amended to reflect the revised standard text for Cambodia and New Zealand. Fifty-three (51) States have operative SQPs in force based on the revised standard text and four States have rescinded their SQPs.

96. The status of safeguards agreements, SQPs, and additional protocols as of 31 December 2014 is shown in the tables in Section B.7.

97. Figure 2 shows the status of additional protocols from 2010 to 2014 for States with safeguards agreements in force.

[36] http://www.iaea.org/OurWork/SV/Safeguards/documents/sg_actionplan.pdf

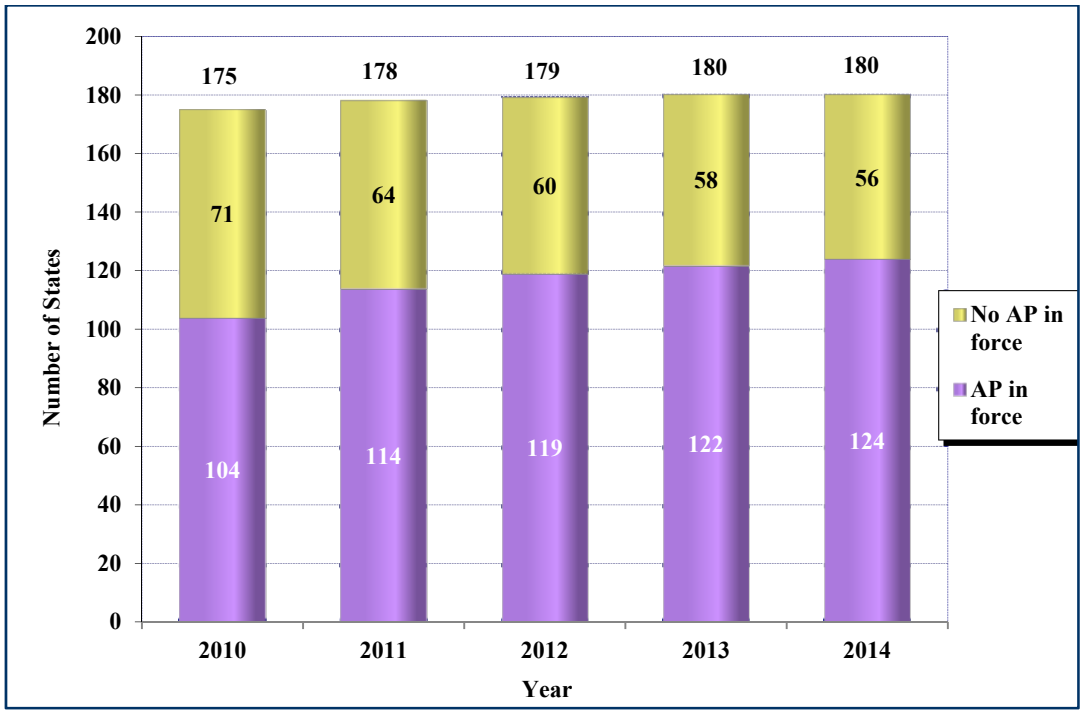

Figure 2. Status of additional protocols for States[2] with safeguards agreements in force, 2010–2014 (the Democratic People's Republic of Korea is not included)

E.2. Strategic planning

98. The Secretariat performs long-range planning to ensure that safeguards will continue to be both effective and efficient in the future. The long term strategic planning of the Department of Safeguards addresses the framework for safeguards implementation, legal authority, technical capabilities (expertise, equipment and infrastructure) and also human and financial resources necessary for Agency verification activities. It also considers communication, cooperation and partnerships with the Agency's stakeholders. In 2014, the Agency continued its implementation of the Agency's *Medium Term Strategy 2012–2017*.

99. Research and development are essential to meet the safeguards needs of the future. In 2014, the Agency continued to implement the *IAEA Department of Safeguards Long-Term Research and Development Plan, 2012–2023* with the assistance of MSSPs. This document outlines the capabilities that the Department needs to achieve its strategic objectives, for which Member State research and development support is needed. The plan covers a number of topics including: safeguards concepts and approaches, detection of undeclared nuclear material and activities, safeguards equipment and communication, information technology, analytical services and training. To remain informed of technological developments with potential safeguards applications, in January 2014, the Agency held a 'Technology Foresight Workshop' in Vienna, attended by participants from 18 States. Thirty-four presentations were delivered on a broad range of topics, including active neutron interrogation, X-ray fluorescence, statistical methods and robotics.

100. To address near-term development objectives and to support the implementation of its verification activities, the Agency continued to rely on MSSPs in implementing its Development and Implementation Support Programme for Nuclear Verification 2014–2015. During 2014, the Secretariat completed the *Biennial Report on the Development and Implementation Support Programme for Nuclear Verification 2012–2013*, which describes the progress that the Department of Safeguards and its 21 MSSPs have made in carrying out the plans enumerated in that programme. In February 2014, the Agency held its biennial MSSP Coordinators meeting. Thirty-nine participants representing all 21 MSSPs attended the meeting, where a number of presentations were given on current and future safeguards challenges.

E.3. Evolving safeguards implementation

101. In August 2014, the Director General submitted a report to the Board of Governors titled *Supplementary Document to the Report on The Conceptualization and Development of Safeguards Implementation at the State Level (GOV/2013/38)*. The supplementary document (GOV/2014/41 and Corr.1) was prepared in response to Member States' requests at the September 2013 meetings of the Board of Governors. It provides clarification and additional information to the 2013 report GOV/2013/38. In addition to providing more details on information presented in GOV/2013/38, the report also describes how the State-level concept is applicable to States with item-specific safeguards agreements and to States with voluntary offer agreements, as requested by Member States.

102. To prepare the supplementary document, the Secretariat held consultations with Member States: it invited[37] Member States to identify areas in writing on which they wished to have further clarification and additional information, and subsequently held six thematic technical meetings and other consultations in the period January to July 2014. The six technical meetings focused on the eight areas identified by the Secretariat in 2013/Note 70 and also on two other areas, namely information security and the drawing of safeguards conclusions, identified by Member States in their written responses and during the course of the meetings. An additional technical meeting was held in August on the supplementary document itself. A consolidated compilation of the Secretariat's presentations at those meetings is available on GovAtom. In addition to these consultations, SAGSI continued to provide the Director General with technical advice on the development and implementation of safeguards in the context of the State-level concept, as it routinely does also on other safeguards matters.

103. The supplementary document addresses questions and issues raised by Member States during the 2013 September meetings of the Board of Governors, the fifty-seventh (2013) session of the General Conference and the consultation process held in 2013–2014 in the following areas:

- State level concept and its application to States with different types of safeguards agreements;
- Legal framework;
- Scope of application of safeguards agreements and generic objectives;
- Technical objectives and acquisition/diversion path analyses;
- Verification effort;
- State-specific factors;
- Safeguards relevant information;
- Information security;
- Performance management;
- Drawing of safeguards conclusions;
- Consultations; and
- Impact on effectiveness and efficiency of safeguards.

[37] 2013/Note 70 of 8 November 2013.

104. The Board of Governors took note of the clarification and additional information provided in the supplementary document and of the Director General's intention to keep the Board of Governors informed on the matter. General conference resolution GC(58)/RES/14, *inter alia*, welcomed the clarifications and additional information provided in the supplementary document, following the intensive consultation process between the Secretariat and Member States. It also welcomed the important assurances contained in the supplementary document and its Corrigenda[38], and in the statements by the Director General and the Secretariat as noted by the Board of Governors in its September 2014 session.

105. During 2014, the Agency implemented State-level safeguards approaches for 53 States[2] under integrated safeguards. The Secretariat will continue to implement State-level approaches for these 53 States and is currently in the process of updating them. The Secretariat also plans for the progressive development of State-level approaches for other States in the future. In developing and implementing a State-level approach for a State, the Agency will consult with the State/regional authority, particularly on the implementation of in-field safeguards measures.

106. To continue ensuring consistency and non-discrimination in the implementation of safeguards, the Agency has continued to improve internal work practices, including the better integration of the results of safeguards activities conducted in the field with those carried out at Headquarters; advances in the handling of safeguards relevant information to facilitate evaluation; further development and testing of internal procedures and guidance, including conducting acquisition path analysis and developing State-level safeguards approaches for States with comprehensive safeguards agreements; and adjustments to the safeguards training programme. Of particular importance is the improvement of the key processes supporting safeguards implementation and the departmental oversight mechanisms relevant to the implementation of these processes.

E.4. Development of verification measures and technologies

E.4.1. Safeguards approaches

107. Site or facility specific safeguards approaches were developed or improved in 2014 for:

- four spent fuel ponds of a reprocessing facility in France;
- dual C/S and Designation of Difficult-to-Access Fuel Items at the Ascó Dry Storage facility in Spain;
- Agency/EURATOM partnership approaches under integrated safeguards for:
  - depleted, natural or low-enriched uranium (DNLEU) conversion and fuel fabrication plants;
  - a nuclear power plant in Romania; and
  - joint use arrangements for the next generation surveillance systems;
- a mock-up gaseous diffusion enrichment laboratory in Argentina;
- the use of remote monitoring at facilities in Switzerland; and
- a gas centrifuge enrichment laboratory in Brazil.

[38] GOV/2014/41/Corr.1

108. The Agency continued to develop and implement more efficient facility-level safeguards measures:

- for verifying spent fuel transfers;
- involving use of unattended monitoring and surveillance systems; and
- using short notice or unannounced routine inspections — including use of a 'mailbox system' — to verify States' declarations of facilities' operational plans and data.

109. The Agency continued to prepare for the future application of safeguards to new types of facility (e.g. geological repositories, spent fuel encapsulation plants, pyroprocessing facilities and laser enrichment facilities). These preparations included assessing the proliferation resistance of nuclear energy systems, evaluating safeguards concepts for specific facility types and identifying safeguards measures early in the design stages of a facility.

110. In 2014, an expert group on the application of safeguards to geological repositories continued to address issues related to the development of safeguards measures and technologies for encapsulation plants and geological repositories, in particular with regard to prospective safeguards technologies and equipment. Also in 2014, a working group on pyroprocessing continued determining the technical measures required to safeguard a pyroprocessing facility.

111. For the effective and efficient implementation of safeguards at new facilities, safeguards measures need to be considered from the initial design planning stages. A publication titled *International Safeguards in the Design of Nuclear Reactors (NP-T-2.9)* was issued in August 2014 in the Agency's Nuclear Energy series.

112. During 2014, the Agency contributed to assessments of proliferation resistant nuclear energy systems through participating in the Agency's International Project on Innovative Reactors and Fuel Cycle and the Generation IV International Forum. In addition, the Agency participated in the Safeguards and Security Working Group under the Republic of Korea and the United States Joint Fuel Cycle Study.

E.4.2. Major safeguards projects

E.4.2.1. Chernobyl

113. The objective of the Chernobyl Safeguards Project is to develop safeguards approaches and instrumentation for routine safeguards implementation at the Chernobyl facilities. The Agency continues to be involved in the early design stages in order to integrate appropriate safeguards measures in an effective and efficient manner. Ukraine informed the Agency that the construction of the 'interim storage facility for spent nuclear fuel, No. 2' and the 'new safe confinement' over the damaged Unit 4 reactor was expected to be completed in 2017.

E.4.2.2 EPGR

114. Finland and Sweden are each planning to construct an encapsulation plant and a geological repository (EPGR) to permanently store spent fuel. The operation of these storage facilities in Finland and Sweden is scheduled to commence in 2022 and 2027, respectively. The EPGR Project coordinates the development of specific safeguards approaches for the encapsulation plants and geological repositories, assesses verification methods and identifies the needs for new equipment and techniques necessary for safeguarding these facilities to optimize safeguards measures at the time these facilities become operational. An EPGR Liaison Group has been formed with representatives from the Agency, the European Commission, Finland and Sweden. The terms of reference for the EPGR Liaison Group were drafted and approved in 2014. The purpose of the group is to provide a forum for the exchange of

technical information during the design and implementation of the EPGR projects in Finland and Sweden, which will facilitate the coordination of the relevant activities within each organization represented. In 2014, technical requirements for installation of safeguards equipment at the encapsulation plant in Finland were identified by the Agency and submitted to Finland in connection with the construction licensing process of the plant. Baseline 3D laser scanning of the excavated area of the geological repository under construction in Finland was performed in 2014 as part of design information verification.

E.4.2.3. Japan Mixed-Oxide Fuel Fabrication Plant

115. Due to construction delays at the Japan Mixed-Oxide Fuel Fabrication Plant, development and implementation activities under this project were limited in 2014.

E.4.3. Information management and analysis

E.4.3.1. Safeguards information system

116. The implementation of Agency safeguards relies heavily on information technology (IT). In November, the Director General submitted a report to the Board of Governors titled *Modernization of Safeguards Information Technology* (GOV/INF/2014/24) which described the Agency's past and present actions to modernize safeguards information technology (IT) and its plans for their completion in the period 2015-2018. The report noted that the Agency's safeguards IT system has gradually become outdated; is increasingly difficult to maintain; is struggling to cope with the mounting volume and diverse formats of data and information; does not support all safeguards activities; and is becoming more vulnerable to cyber attacks. The report concluded that it is now essential that modernization of the system be completed.

117. To this end, and building on work carried out previously, the Agency in 2014 continued to make improvements to the overall structural re-engineering, performance and security of its safeguards information system. To prepare for the decommissioning of the mainframe computer, it worked to transfer data from the mainframe computer to a new, distributed platform, and to re-develop the associated software applications. By the end of the year, more than half of the major software applications had been accepted by the Department of Safeguards user community. The remaining applications were in late stage testing. In support of information analysis, several key elements were added to the information analysis capabilities, including enhancements and new features in the integrated analysis toolset. New mechanisms were developed to allow for data analysis within the secure internal network. Monitoring and alerting capabilities were expanded to help the Agency detect and respond to unauthorized access to, or disclosure of, information within the Agency's custody.

118. The final step in the modernization will be carried out under the Modernization of Safeguards Information Technology (MOSAIC) project. The MOSAIC project will focus on enhancing existing tools and applications, introducing new tools and applications, and on strengthening information security. In 2014, work on defining the full scope of MOSAIC was completed, with identification of projects, resource needs and timeline. Implementation is expected to start in 2015 after the transfer of data and software applications off the mainframe computer to the new platform. The Agency's objective is to have a modernized safeguards IT system in place in 2018 that allows the Agency to perform safeguards activities more effectively and efficiently.

E.4.3.2. Information analysis

119. 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 processes, evaluates and conducts consistency analysis of State declarations, the results of Agency verification activities and other safeguards relevant information available to the Agency. 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, destructive assay, environmental sample analyses and remotely monitored equipment. The Agency also draws on a diverse range of other safeguards relevant information sources, including commercial satellite imagery, open sources, and trade information. Throughout 2014, the Agency continued to investigate new tools and methodologies to streamline and prioritize workflows and processes.

120. To continuously improve the quality of the information on which it must rely, the Agency monitored the performance of laboratories and measurement systems and organized international technical meetings, training and workshops for various States on nuclear material accounting, including measurement data analysis, statistical methodologies and material balance evaluation concepts. The results of this monitoring were included in 89 performance evaluation reports issued in 2014.

121. 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, and upon request for other cases. The evaluations include the processing, reconciliation and statistical analysis of non-destructive assay and destructive analysis measurements and their comparison with State declarations. A total of 141 destructive analysis reports were produced, covering 433 uranium samples, 55 plutonium samples, nine heavy water samples and two input solution samples. Two hundred and five (212) reports evaluating the balances of all nuclear material types were prepared for 83 (84) MBAs in 55 (56) facilities in 2014.

122. In 2014, the Agency prepared 314 (243) environmental sampling reports and 38 (42) summaries covering 416 (423) samples taken by the Agency from 34 (36) States. These reports integrate and interpret the measurement results from the analytical methods that were used by the Network of Analytical Laboratories (NWAL). The measurement results are evaluated against States' declarations to identify the potential presence of undeclared nuclear material or activities. Included in the above number of reports are reports on enhanced destructive analysis measurements of uranium impurities, particularly impurities in uranium ore concentrates.

123. In 2014, the Agency acquired 407 (652) commercial satellite images in support of safeguards verification activities. The imagery was acquired with regard to 43 (54) States[2, 39] from 16 (20) different Earth observation satellites. Of these images, 189 (291) were new acquisitions, and the remaining 218 (183) were purchased or received from the public archives of the Agency's commercial satellite imagery providers. In 2014, the Agency produced 127 (118) imagery analysis reports, including several imagery-derived and geographical information system products, to support verification activities in the field and at Headquarters.

124. During 2014, the Agency collected approximately 23 150 safeguards relevant open source information items and prepared 820 summaries of safeguards relevant information for the evaluation of 180 States[2, 40]. The Agency is continuing to invest in new tools and methods to streamline and prioritize workflows and processes.

125. The analysis of nuclear-related open source and trade information can provide indications of possible covert procurement networks, indicators of potential undeclared nuclear activities, and specific information on a State's nuclear fuel cycle activities.

126. During 2014, open source and trade information were routinely used to support analysis of nuclear related trade. In 2014, Member States provided the Agency with information concerning 115

[39] Including the DPRK.

[40] See footnote 39.

(140) unfulfilled procurement enquiries for nuclear-related products. This information was used to assess the consistency of nuclear activities declared by States to the Agency. From this and other data, 50 trade analysis reports were produced for State evaluation purposes.

E.4.4. Sample processing and analysis

127. While facing an increased number of analyses of all types, in 2014 the Agency continued its efforts to reduce delays in the receipt, distribution, and analysis of environmental sampling results. In previous years, root causes of sample processing delays had been identified, and these were addressed through various measures intended to shorten the time for collection, distribution, analysis and evaluation. The time between screening of a sample and distribution of the sample to a network laboratory continued to shorten significantly from a median of 31 days in 2013 to 17 days in 2014. Special attention was devoted to maintain comparable analysis times despite the increased number of analyses.

128. The NWAL consists of the Agency's Safeguards Analytical Laboratories, at Seibersdorf, Austria, and 20 other qualified laboratories of the Member States and the European Commission. The Safeguards Analytical Laboratories are composed of the Environmental Sample Laboratory and the Nuclear Material Laboratory (NML), which includes Agency staff at the On-Site Laboratory in Rokkasho, Japan. The Agency provides logistical support for the sampling, transport and analysis of nuclear material and environmental samples, and coordination of all reference material samples used by the quality control process to monitor the measurement system.

129. Significant contributions were received from Member States, not only through analyses carried out by the NWAL but also through contributions of the MSSPs to the development and implementation support projects on destructive analysis of nuclear material, environmental sample analysis, and other analysis.

E.4.4.1. Nuclear material and heavy water sample analysis

130. In 2014, the Agency collected 488 (455) nuclear material samples and nine (seven) heavy water samples. All accountancy samples except the heavy water samples were analysed by the Agency's NML. The heavy water analysis was performed by the Hungarian Academy of Sciences, Centre for Energy Research. In addition, 77 (79) samples were analysed by the Agency at the Rokkasho On-Site Laboratory.

E.4.4.2. Environmental and other sample analysis

131. In 2014, the Agency collected 416 (423) environmental samples, including 308 (371) swipe samples and 108 (52) samples for other sample analysis. This resulted in the analysis of 910 (791) subsamples by network laboratories for bulk and particle analysis of uranium and plutonium, concentration and/or isotopic composition, and other analyses. Of these subsamples, 187 (153) were analysed at the Safeguards Analytical Laboratories — 100 (104) at the Environmental Sample Laboratory and 87 (49) at the NML.

E.4.4.3. Enhancing the capability of the Safeguards Analytical Services (ECAS)

132. Transition activities needed to move into the newly completed NML continued throughout 2014, including the procurement and receipt of equipment required for both the chemical and

instrumentation laboratories. At the end of 2014, approval to undertake active testing in the new facility was being sought from the Agency's internal regulator and from the Austrian Government.[41]

133. Overall, the ECAS project activities had reached 84% completion as of 31 December 2014. The project remains on schedule and within the approved budget.

134. During the course of the year procurement was undertaken for the construction of the new Main Gate Facility, including vehicle parking, pedestrian and vehicular gate facilities, a goods receiving area and a dedicated environmental samples screening room. Construction of the new facility began in the third quarter of 2014 and is proceeding on schedule for completion in the second quarter of 2015. In addition, the ECAS team completed the new active waste water line from the new NML to the off-site treatment facility in the adjacent Austrian Institute of Technology site, and also completed the new electrical power system upgrade providing a more reliable power distribution system through the Agency's Seibersdorf site. Activities remaining for completion prior to the end of 2015 include completion of the new main gate facility, construction of added training and administration space in the NML office wing and completion of the transition from the existing to the new NML.

E.4.4.4. Expansion of the Network of Analytical Laboratories

135. Work continues to expand the use of the NWAL for both nuclear material analysis and environmental sample analysis. In order to ensure adequate backup for the analysis of nuclear material samples, during 2014 the Agency qualified and contracted the French Alternative Energies and Atomic Energy Commission's (CEA's) Laboratory for the Development of Nuclear, Isotopic and Elemental Analysis (LANIE). CEA/LANIE joined the NWAL in August 2014.

136. Laboratories for environmental or nuclear material sample analysis are in the process of qualification in several States. Laboratories in China, the Czech Republic, Hungary, and the Republic of Korea were undergoing qualification for environmental sample analysis in 2014. In addition, laboratories in Belgium, Canada, Germany, the Netherlands, and the United States of America are undergoing qualification for nuclear material analysis. A laboratory in Argentina is also undergoing qualification for heavy water analysis.

E.4.5. Safeguards equipment development and implementation

137. Throughout 2014, the Agency provided equipment and technical support for verification activities in the field, ensuring that instrumentation and monitoring equipment vital to the implementation of effective safeguards worldwide continued to function as required. More than 8000 (7000) pieces of verification equipment were dispatched to support verification activities in the field.

138. Significant financial and human resources were dedicated to preventive maintenance and performance monitoring to ensure the reliability of the Agency's standard equipment systems. The reliability of digital surveillance systems, unattended monitoring systems and electronic seals exceeded the target reliability goal of 150 months for mean time between failures. This reliability at the system level was achieved through redundancy to mitigate potential single component failures.

E.4.5.1. Non-destructive assay systems

139. During 2014, 2082 (1974) separate pieces of equipment were prepared and assembled into 969 (891) portable and resident non-destructive assay systems of 140 (140) different types. Four

[41] As of March 2015, the Agency's internal regulator has given approval, and active testing of the laboratory can begin once the Austrian authorities confirm their approval.

hundred and thirty-six (288) calendar-days of in-field technical support were provided to perform equipment maintenance, directly contributing to inspection efforts and providing training in the field.

140. The following enhancements to the Agency's non-destructive assay capabilities for the detection of undeclared activities were accomplished during the year:

- Combination of radiation measurement with Monte Carlo simulations was used to verify core emptiness at on load reactors.

141. The following improvements to the Agency's non-destructive assay capabilities to verify declared nuclear material and activities were achieved during the year:

- Two new neutron coincidence electronic units were authorized for inspection use to replace obsolete shift registers;
- Advanced neutron noise analysis was introduced to verify nuclear material involved in subcritical assemblies;
- The CANDU bundle verifier for baskets has been modernized and is ready for deployment at CANDU reactors;
- Development and evaluation of alternatives to the helium-3 neutron detector continued with the testing of liquid scintillator based and hybrid boron-helium based coincidence counters.

E.4.5.2. Surveillance systems

142. By the end of 2014, the Agency had 1354 (1322) cameras connected to 785 (612) systems operating at 263 (251) facilities in 35 (34) States[2].

143. The Agency continued with the next generation surveillance system (NGSS) replacement campaign, replacing a large number of old and obsolete DCM-14 cameras (Figure 3). Resources needed for this replacement campaign are currently partially funded through a dedicated item in the Agency's Major Capital Investment Fund.

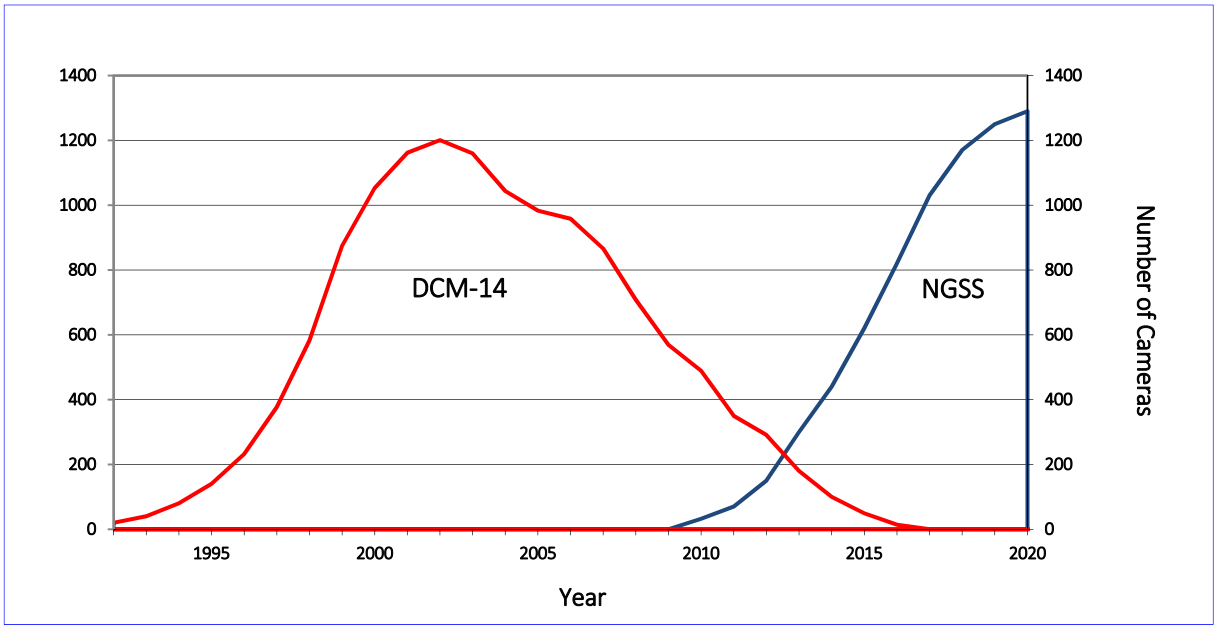

Figure 3. Replacement campaign of DCM-14 based cameras with NGSS technology

144. During 2014, the efforts for installing, replacing or maintaining surveillance cameras required 35 (47) missions comprising 361 (425) calendar days of in-field technical support activity. The

Agency also maintains approximately 200 cameras owned by State or regional authorities and used jointly with the Agency.

145. The following enhancements to surveillance systems were accomplished during the year:

- More than 200 old DCM-14 based cameras and systems were replaced by NGSS technology. These systems were deployed in Argentina, Brazil, Finland, Germany, India, Iran, Japan, the Republic of Korea, Spain and Sweden.
- Multi-camera NGSS server systems were deployed in various nuclear facilities in India, Japan, Pakistan and the Republic of Korea.
- Three-dimensional laser scanners were successfully used in mapping the underground tunnel system of the Finnish geological repository in Onkalo.
- The NGSS underwater camera development was finalized and several units were procured for field implementation in 2015.

146. In 2014, cooperative efforts continued with the European Commission and ABACC for the procurement, acceptance testing, training, installation, and maintenance of jointly used surveillance systems. Arrangements related to the joint use of the next generation surveillance system were finalized and joint field implementation of equipment owned by the European Commission and ABACC has started. Both regional safeguards systems have procured substantial numbers of equipment items in the process.

E.4.5.3. Containment systems and instrumentation security

147. Maintaining continuity of knowledge through sealing containers of nuclear material and critical equipment components remains one of the most important elements of the Agency's verification activities. In 2014, the Agency verified approximately 23 200 (25 400) seals that had been installed on nuclear material or Agency safeguards equipment at nuclear facilities.

148. Within the framework of the sealing and containment modernization programme, the Agency is continuously working on the implementation of new and alternative verification technologies and also improving the overall security of instruments. In 2014, the following enhancements of sealing systems were accomplished:

- The remotely monitored sealing array was authorized for Safeguards use/application. This radiofrequency seal has the ability to improve sealing security and significantly reduce verification efforts on nuclear material stored in large arrays.
- The glass seal prototype — a potential replacement for the metal seal — successfully passed a third-party independent vulnerability assessment.
- The ultrasonic optical sealing bolt, a new high security sealing system for dry storage containers, was authorized for Safeguards use in 2014. This system significantly improves sealing security while reducing inspection efforts at nuclear material storage facilities.

E.4.5.4. Unattended monitoring systems

149. At the end of 2014, 153 (155) unattended monitoring systems had been installed in 22 (22) States. Of these, 128 (132) measure radiation, ten (eight) are thermohydraulic monitors and 15 (15) are solution volume measurement systems. In 2014, 12 (12) major system upgrades were completed, and 22 (31) maintenance visits were conducted, requiring 473 (491) calendar days of technical support in the field.

150. In 2014, the following enhancements to unattended monitoring systems were made:

- Quality control procedures for unattended monitoring systems, including an acceptance testing station for critical devices and a system issue tracking tool, were fully implemented in order to further improve the systematic approach for reliability and quality assessment;
- All unattended monitoring systems at the Rokkasho reprocessing plant (Japan) and the Bruce nuclear power plant (Canada) were successfully upgraded;
- Deployment continued of the next generation of Agency data acquisition module (ADM2), which is the new standard data acquisition module for unattended monitoring systems dedicated to CANDU-type reactors;
- A new mobile unit for neutron detection with extended battery lifetime was developed and is now available for field use;
- The unattended fork detector monitor (UFDM) that comes with data acquisition electronics in a small case for easy transportation (see Figure 4) is now available for field testing;
- The on-line enrichment monitor (OLEM) was successfully tested and will be ready for field deployment in 2015 (see Figure 5);
- Development continued on unattended gamma emission tomography and the unattended cylinder verification system through MSSP projects and on the implementation of unattended monitoring systems at the ISF2 storage facility (Chernobyl/Ukraine); and
- New detectors were introduced to facilitate collimator alignments in multi-silo spent fuel dry storage facilities and to cope with flooding.

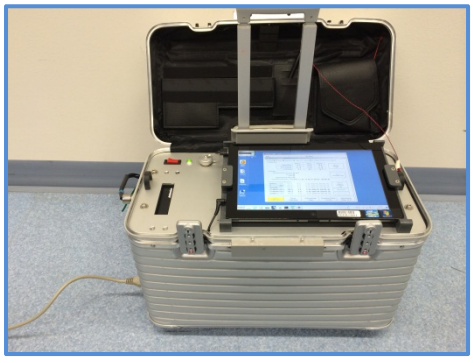

Figure 4. UFDM electronics in small portable case

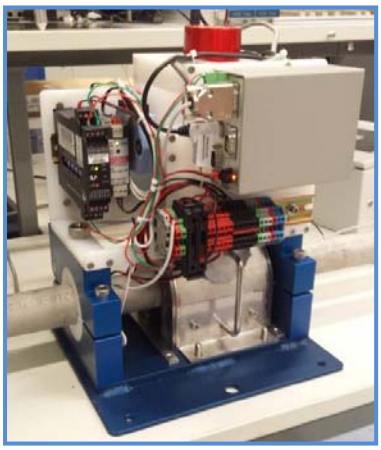

Figure 5. OLEM system

E.4.5.5. Remote monitoring

151. The use of remote monitoring systems increases the effectiveness and efficiency of Agency safeguards activities by reducing the number of times inspectors must travel to a facility or by permitting inspectors to focus on other verification measures, thus reducing the length of inspections. Discussions on implementing remote monitoring systems at facilities continue with several States.

152. At the end of 2014, 285 (279) safeguards systems were operating in remote monitoring mode at 127 (123) facilities in 23 (23) States[2]. In addition, 207 (206) electronic-optical sealing systems (EOSS) were being read remotely.

153. The following enhancements to remote monitoring were accomplished during the year:

- A real-time and integrated stream-oriented remote monitoring interface (RAINSTORM) was implemented in several sets of safeguards equipment.
- Integrated review and analysis package (iRAP) development, phase I, data review, has been completed and successfully tested. Contractual arrangements (phase II; non-destructive assay analysis) have been initiated.
- The first remote monitoring installation in Finland became operational.
- The remote monitoring infrastructure in Canada was upgraded.
- A workshop on software sustainability was held in Vienna, Austria.

E.4.5.6. Instrumentation technology foresight

154. The instrumentation technology foresight activities aim at identifying and evaluating emerging instrumentation technologies from which the Agency could benefit. Two workshops focusing on evaluation of emerging technologies were held in 2014, one on indoor positioning and the second on portable instrumentation for identification of non-radioactive material in support of complementary access and design information verification missions. A total of 21 technology stakeholders and suppliers from 10 States were involved. Initial field testing of an indoor positioning data collection system proved the viability and usefulness of the concept towards efficient geo-referencing of data collected in the field. Other technologies currently under evaluation include advanced 3D scanning, optical character recognition, electronic pens and advanced cameras.

E.5. Cooperation with State and regional authorities

155. The effectiveness and efficiency of Agency safeguards depend, to a large extent, on the effectiveness of State and regional systems of accounting for and control of nuclear material and on the level of cooperation between State/regional authorities and the Agency.

E.5.1. Assistance by State and regional authorities

156. Actions were undertaken by a number of States that enhanced the effectiveness and efficiency of Agency safeguards implementation.

157. In 2014, the Agency held discussions with ABACC, the European Commission and the Republic of Korea aimed at increasing 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. Other actions are shown in Fact box 10.

Fact box 10. State or regional authority actions enhancing effectiveness and efficiency of safeguards implementation

Representative examples during 2014 include:

- hosting regional workshops to raise the awareness of Agency safeguards;
- leading efforts to strengthen safeguards implementation in a region;
- providing use of facilities in the State to train Agency safeguards inspectors, thus supporting their development and qualification;
- performing national inspections at facilities and LOFs; validating operator data; ensuring the quality of records, reports and declarations prior to submitting information to the Agency; and voluntarily sharing the results of national inspections with the Agency;
- providing the Agency with early design concepts to assist in developing safeguards measures for emerging new nuclear fuel cycle technologies;
- consulting the Agency and providing early information to allow for the integration of safeguards features into the design of new facilities, thus allowing the Agency adequate time to plan safeguards activities, test new instruments and safeguards approaches and verify the design of such facilities as they are built;
- communicating extensively with the Agency to coordinate the logistics of verification activities, including shipping equipment to facilities and providing equipment, if needed; and
- transporting Agency equipment and staff to facilities to enable timely and effective completion of tasks.

E.5.2. Assistance to State and regional authorities

158. To assist States with SQPs in building capacity for implementing their safeguards obligations, the Agency published the *Safeguards Implementation Guide for States with Small Quantities Protocols (IAEA Services Series 22)* in English in 2013. In 2014, the SQP Guide was published in French and Spanish, and the publication was transmitted to all States with SQPs. In December 2014, an updated version of the *Guidance for States Implementing Comprehensive Safeguards Agreements and Additional Protocols* (IAEA Services Series 21) was published. In addition, the first of four guides on safeguards implementation practices was published in December 2014 titled, *Safeguards Implementation Practices Guide on Facilitating IAEA Verification Activities* (IAEA Services Series 30). At that time, three other such guides were in various stages of development and publication, addressing (i) establishing and maintaining State safeguards infrastructure, (ii) providing information to the Agency; and (iii) collaborative approaches to safeguards implementation. The guides and other safeguards guidance are available for States at the Resources and Assistance for States webpage at www.iaea.org/safeguards.

159. The IAEA State System of Accounting for and Control of Nuclear Material Advisory Service (ISSAS) provides States, at their request, with advice and recommendations on the establishment and strengthening of such State systems. The Agency conducted three ISSAS missions in 2014 — in Kyrgyzstan, the United Arab Emirates and Uzbekistan. It also held seven international, regional and national training courses for personnel responsible for overseeing and implementing the systems of accounting for and control of nuclear material, and participated in several other training activities organized by Member States.

160. Also, in 2014, the Agency developed the first e-learning programme on safeguards, in the framework of the interactive e-learning series explaining the Agency's milestones approach to introducing a nuclear power programme.

161. In September 2014, the Agency participated as an observer in the Asia Pacific Safeguards Network plenary meeting in Nay Pyi Taw, Myanmar, delivering lectures on safeguards implementation in States with SQPs and on implementation of an additional protocol.

162. To familiarize new members of Permanent Missions with Agency safeguards, the Agency held a one-day seminar on IAEA safeguards in January 2014. Seventy-eight participants from 47 Member States and delegations of the European Union and of the League of Arab States attended the event, which featured presentations by the Secretariat, a tour of the safeguards technology laboratories and a demonstration of satellite imagery analysis.

Fact box 11. Agency training activities

In 2014, the Agency provided training to personnel of State and regional authorities and facility operators in the form of:

- an international training course on State systems of accounting for and control of nuclear material, held in Japan;
- an international training course on SQPs, held in the United States of America;
- an inter-regional training course on safeguards and security aspects of nuclear material accounting and control at facilities, held in Indonesia;
- an inter-regional training course on regulator-operator interfaces, held in Finland;
- a regional training course on State systems of accounting for and control of nuclear material and non-destructive assay, held in Algeria;
- a pilot regional training course on State systems of accounting for and control of nuclear material for newcomers, held in the Republic of Korea; and
- a national workshop on the technical and administrative aspects of the accounting for and the control of nuclear material and nuclear security, held in Oman (in cooperation with the Agency's Office of Nuclear Security).

E.6. Quality management

163. The quality management system within the Department of Safeguards provides regular and routine oversight of the key safeguards processes and their results to ensure impartiality, effectiveness and efficiency of safeguards implementation. The performance of quality control reviews has been strengthened to assess the effectiveness of the various aspects of safeguards implementation. In 2014, the Department initiated activities to identify, select, and determine how to use performance indicators more effectively to assess Departmental activities and results.

164. The accomplishments of the quality management activities with regard to the Department of Safeguards follow:

- In 2014, the Department of Safeguards issued internal quality audit reports on:
  - activities of the section for effectiveness evaluation;
  - industrial safety;
  - preparation for ISO/IEC 17025:2005 accreditation for selected methods in the Office of Safeguards Analytical Services;
  - internal validation of ISO 9001:2008 in the Office of Safeguards Analytical Services;
- Sixty condition reports identifying non-conforming/potentially non-conforming conditions and radiological and industrial safety events were initiated. This number includes condition reports initiated as a result of internal quality audit findings. Root cause analyses were performed and actions to prevent recurrence were initiated. Thirty-six of these reports were

closed in 2014. The condition report work flow and tracking system was released for Department-wide use.

- Quality control reviews were performed on the results of approximately 230 safeguards verification activities. For more than 90% of the activities reviewed, no significant concerns were identified. Where the quality control reviews observed potential deficiencies, the finding was further assessed and, if significant, a condition report (see above) was initiated to ensure that follow-up actions were taken.

- In 2014, staff training was conducted to raise awareness of the quality management system, including managing and controlling safeguards documents, the use of the condition report system, and the principles of continual process improvement.

- The Department's cost calculation methodology, which is used to estimate the cost of safeguards implementation by State and to compare costs and effort of options in safeguards approaches, was updated and refined to reflect experience gained in its implementation. This included revisiting and updating the process maps and estimates for State evaluation, developing State-level approaches and performing design information verification.

- Knowledge management efforts were enhanced to support supervisors in identifying the retention of critical job-related knowledge from 29 staff members retiring or separating from the Department of Safeguards.

- Safeguards documentation necessary to perform in-field verification activities and the drawing of safeguards conclusions was further reviewed to ensure that activities were consistent with internal safeguards policies and procedures. These documents were also cross-referenced with main safeguards processes. Special attention was paid to forms and working papers to ensure their completeness and correctness. Compatibility of the data collected through this documentation with other safeguards databases was ensured.

- Additional improvements to the safeguards core document management system were made to ensure its availability in a secure environment and to be in line with the MOSAIC project.

E.7. Information Protection

165. In the light of today's constantly changing information security environment and technology advances, and also the additional threats and risks to safeguards information, the Agency continues to review its policies, procedures, and practices related to information security, with an initial focus on the classification, handling and protection of safeguards information. The aim of the review is to balance information security with making safeguards information available to staff members who need it in order to carry out their responsibilities. Additional training in classification and handling of classified information is being conducted throughout the Department, mandatory for all staff dealing with safeguards information.

166. Security awareness continues to be a major priority, and awareness campaigns and enhancements to the information security e-learning programme continue to be implemented. Specialized briefings for inspectors and other safeguards staff continue, with information security, including classification and handling of classified information, now being taught as a module in the Introductory Course on Agency Safeguards.

167. The physical security of offices is maintained through a security management and access control system. All Agency servers, a mainframe computer, disk storage and network equipment are stored in a highly secure data centre. Information security is being improved through, for example, the systematic application of security patches and upgrades to servers, switches and laptop and desktop

computers; better encryption; internal and external vulnerability reviews; the development of in-house capabilities to combat information technology threats; and the enhancement of the disaster recovery and business continuity capability.

E.8. Safeguards Symposium

168. In October, the Agency held its twelfth Symposium on International Safeguards in Vienna, titled Linking Strategy, Implementation and People. Six-hundred-and-fifteen registered participants from 54 States and 11 international organizations attended the event. Since the 2010 Safeguards Symposium, the Secretariat had published *IAEA Department of Safeguards Long-Term R&D Plan, 2012–2023* (Safeguards Technical Report No. STR-375). The objective of the 2014 Symposium was to foster dialogue, exchange information and promote cooperation between the Secretariat, Member States, the nuclear industry and members of the broader safeguards and nuclear non-proliferation community in the context of this plan. During the Symposium, the Secretariat and other participants presented 312 papers highlighting the breadth of activities required to achieve the Department's objectives. The Agency's priorities were examined with key session themes addressing the forthcoming challenges in the areas of advancing cooperation between the Agency and States; strengthening the Agency's technical capabilities (safeguards approaches, technologies and infrastructure); bolstering its State evaluation capabilities (e.g. information collection and evaluation); and managing the safeguards workforce and knowledge. The Symposium was supported by an extensive exhibition with 35 exhibitors demonstrating a broad range of achievements and new technologies.

F. Safeguards Expenditures and Resources

169. This section provides information on the level and use of financial and human resources for safeguards implementation during 2014. The activities of Major Programme 4 — Nuclear Verification — were funded from various sources, primarily through the Regular Budget and extrabudgetary contributions. The Regular Budget appropriation for 2014 was adjusted to €126.4 (€124.1) million at the average United Nations exchange rate. In 2014, the extrabudgetary allotments were €31.8 million.

170. Total expenditure for Major Programme 4 from the 2014 Regular Budget was €124.4 million. In addition, €21.9 million was spent from extrabudgetary contribution allotments.

171. The total combined safeguards expenditures from the Regular Budget and extrabudgetary contributions were distributed among expenditure categories as follows: staff costs — 65%; equipment — 11%; non-staff costs — 11%; contracts — 7%; travel — 6% and reimbursement of work for others — (-1%).

172. During 2014, major investments were made for purchasing new or replacement equipment for the next generation surveillance system, the infrastructure and security necessary for sustainable laboratory operations, and modernizing safeguards information technology.

F.1. Financial resources

F.1.1. Regular Budget expenditures

173. The Regular Budget utilization rate for Major Programme 4 was 98.4%, whereby €2.0 million remained unspent from the 2014 Regular Budget at the end of the year.

174. Major Programme 4 encompasses four main programmes: Overall Management, Coordination and Common Activities; Safeguards Implementation; Other Verification Activities; and Development. Major Programme 4 also includes a dedicated programmatic element on Corporate Shared Services.

- The Overall Management, Coordination and Common Activities programme includes the resources necessary to provide a central management and coordination function, programme and resource management, security, and quality management.
- The Safeguards Implementation programme includes projects such as verification activities, information analysis, effectiveness evaluation, concepts and planning, provision of safeguards instrumentation and safeguards analytical services.
- The Other Verification Activities programme includes the activities needed to maintain operational readiness to resume safeguards implementation for the DPRK.
- The Development programme includes developing safeguards concepts, approaches, instrumentation and technologies. This programme also includes increased costs related to the transfer of mainframe applications and data to a new information technology environment.
- All corporate services attributed to the safeguards implementation which were formerly distributed under different programmes were consolidated under one umbrella programme, Corporate Shared Services.

175. The breakdown of the Regular Budget expenditures by programme is shown in Figure 6.

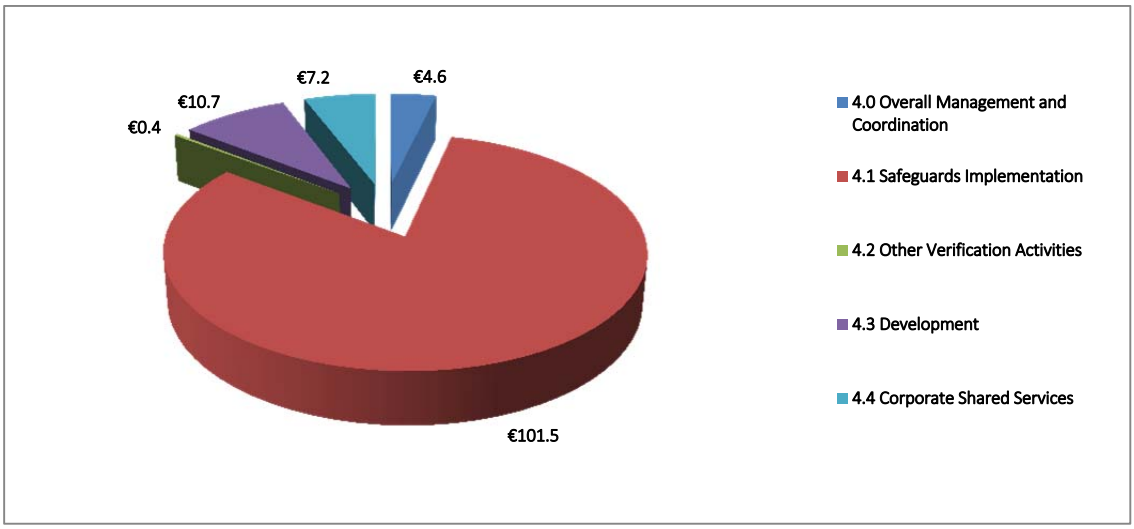

Figure 6. Major Programme 4 structure 2014 (in € millions)

176. The breakdown of the Regular Budget expenditure by item of expenditure for 2014 is presented in Figure 7.

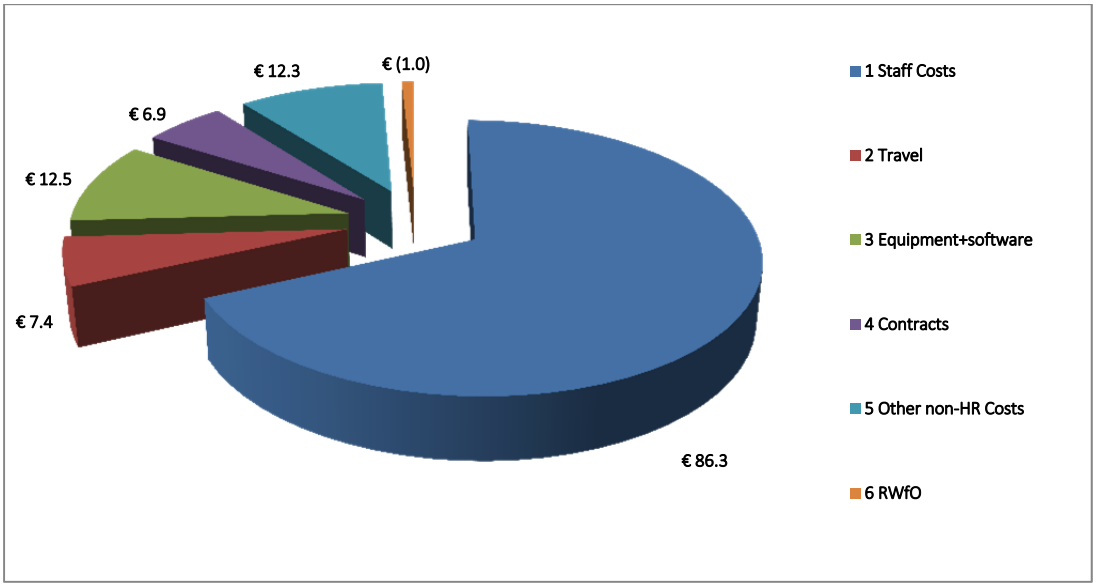

Figure 7. 2014 Regular Budget expenditure by item of expenditure (in € millions)

F.1.2. Extrabudgetary contributions and expenditures

177. During 2014, €31.8 million was allotted from Member States' contributions and from the interest earned from the contributions. The allotments were designated to specific safeguards activities to be implemented over each project's life span. The related extrabudgetary allotments by donor are shown in Table 6. During the year, a total of €21.9 million from the extrabudgetary contributions was

spent. Mainly, the following activities were funded from extrabudgetary contributions: €7.6m was used to finalize construction and installation contracts within the ECAS project, €6.4m was spent on implementation of monitoring and verification activities in Iran in relation to the Joint Plan of Action, €1.3m was spent on upgrading safeguards analytical capabilities and €6.6 million was spent on various other operational activities of the Department of Safeguards.

Table 6 – Extrabudgetary allotments by donor during 2014 (in € millions)

Donor	Current Budget Allotment (€)	%
Australia	0.12	0.4%
Belgium	0.15	0.5%
Canada	1.74	5.4%
China	0.17	0.5%
Denmark	0.27	0.8%
Estonia	0.02	0.1%
Finland	0.30	0.9%
France	0.61	1.9%
Germany	1.75	5.5%
Italy	0.06	0.2%
Japan	0.89	2.8%
Kazakhstan	0.02	0.1%
Korea	0.72	2.3%
Kuwait	0.25	0.8%
Latvia	0.01	0.0%
Netherlands	0.38	1.2%
New Zealand	0.06	0.2%
Norway	0.68	2.1%
Other Sources	0.02	0.1%
Pakistan	0.02	0.1%
Russian Federation	0.45	1.4%
Saudi Arabia	0.50	1.6%
Sweden	0.11	0.3%
Switzerland	0.10	0.3%
Turkey	0.05	0.2%
United Kingdom of Great Britain and Northern Ireland	1.04	3.3%
United States of America	21.26	67.0%
Grand Total	**31.75**	**100.0%**

178. The breakdown of the expenditures from extrabudgetary contributions of €21.9 million by expenditure category is shown in Figure 8. In 2014, the largest share was related to staff costs. Other significant expenditures were related to equipment, contracts and numerous training events and workshops organized to enhance competencies in safeguards implementation.

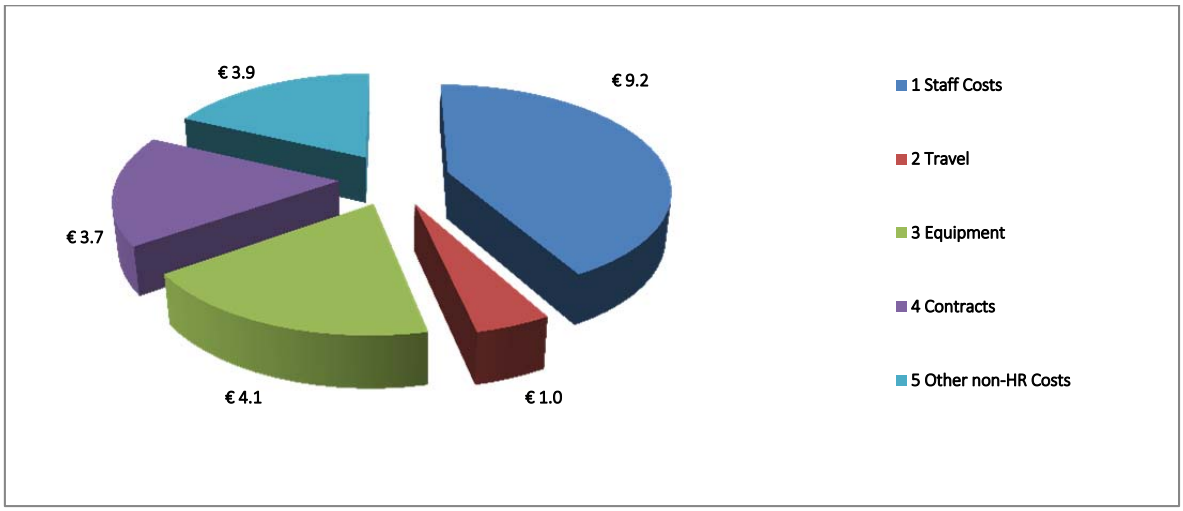

Figure 8. 2014 Extrabudgetary contribution expenditures per category (in € millions)

F.1.3. Estimation of safeguards costs by State

179. The Agency has implemented a methodology that allows safeguards implementation costs to be calculated on a State-by-State basis in a consistent manner. The basis for this cost calculation methodology is a product cost model that estimates the resources required to implement the core processes of Major Programme 4. By accumulating and allocating appropriate shared costs for each product or category of product, the model calculates the full cost of a product or product category of these core processes.

180. Although the model is based on average costs, State-specific adjustments were applied to determine the estimated cost of safeguards implementation by State. These adjustments were made with regard to calendar days in the field for verification, sampling and material balance evaluation. Adjustments were also made for certain States to reflect the extra effort spent at Headquarters which falls outside the products currently identified for the core processes.

181. Table 7 shows the estimated safeguards expenditures in 2014 that can be attributed to specific States. The estimated efforts for in-field verification and for information analysis and evaluation are components of these estimated costs. Special (in-kind) contributions received from Member States on the basis of a 'cost sharing principle' associated with, for example, training and the joint use of equipment are excluded from these figures. In this assessment, 87% (87%) of the money spent from the Regular Budget can be attributed to specific States. The remainder includes costs for certain other specific products and activities, and Agency expenditures that are not accounted for by the cost calculation model at this time.

182. For 2014, the cost calculation model has continued to evolve and be revised in order to more fully capture the costs of the Agency and assign those costs to specific products and States. Improvements in 2014 included clarifying the definition and sources of data to be used for calculating and reporting costs. Therefore, changes in estimated costs from prior years may be the result of refinements in the calculation methodology and not necessarily changes in the activities performed for the State. These changes are reflected in the costs by State shown in Table 7.

Table 7 – Estimated cost of safeguards by State in 2014

State	Estimated regular budget cost (€)
Afghanistan	€35 000
Albania	€79 000
Algeria	€382 000
Andorra	€21 000
Angola	€30 000
Antigua and Barbuda	€16 000
Argentina	€2 931 000
Armenia	€344 000
Australia	€417 000
Austria	€87 000
Azerbaijan	€330 000
Bahamas	€30 000
Bahrain	€30 000
Bangladesh	€104 000
Barbados	€30 000
Belarus	€619 000
Belgium	€3 788 000
Belize	€30 000
Bhutan	€30 000
Bolivia	€30 000
Bosnia and Herzegovina	€94 000
Botswana	€67 000
Brazil	€3 174 000
Brunei Darussalam	€16 000
Bulgaria	€588 000
Burkina Faso	€34 000
Burundi	€30 000
Cambodia	€30 000
Cameroon	€30 000
Canada	€5 412 000
Central African Republic	€39 000
Chad	€35 000
Chile	€260 000
China	€1 709 000
Colombia	€174 000
Comoros	€16 000
Congo,	€30 000
Costa Rica	€30 000
Côte D'Ivoire	€30 000
Croatia	€40 000
Cuba	€102 000
Cyprus	€44 000
Czech Republic	€1 092 000

State	Estimated regular budget cost (€)
Democratic People's Republic of Korea	€957 000
Democratic Republic of the Congo	€115 000
Denmark	€75 000
Dominica	€16 000
Dominican Republic	€19 000
Ecuador	€34 000
Egypt	€833 000
El Salvador	€35 000
Estonia	€103 000
Ethiopia	€30 000
Fiji	€16 000
Finland	€882 000
France	€2 638 000
Gabon	€35 000
Gambia	€16 000
Georgia	€339 000
Germany	€6 712 000
Ghana	€99 000
Greece	€56 000
Grenada	€16 000
Guatemala	€30 000
Guyana	€16 000
Haiti	€16 000
Holy See	€21 000
Honduras	€30 000
Hungary	€837 000
Iceland	€34 000
India	€2 691 000
Indonesia	€727 000
Iran, Islamic Republic of	€12 478 000
Iraq	€67 000
Ireland	€101 000
Israel	€157 000
Italy	€777 000
Jamaica	€79 000
Japan	€18 350 000
Jordan	€74 000
Kazakhstan	€2 800 000
Kenya	€34 000
Kiribati	€16 000
Korea, Republic of	€4 198 000
Kuwait	€35 000
Kyrgyzstan	€72 000
Lao People's Democratic Republic	€16 000

State	Estimated regular budget cost (€)
Latvia	€73 000
Lebanon	€30 000
Lesotho	€20 000
Libya	€361 000
Liechtenstein	€30 000
Lithuania	€489 000
Luxembourg	€37 000
Madagascar	€34 000
Malawi	€34 000
Malaysia	€237 000
Maldives	€16 000
Mali	€35 000
Malta	€69 000
Marshall Islands	€16 000
Mauritania	€16 000
Mauritius	€36 000
Mexico	€560 000
Monaco	€34 000
Mongolia	€35 000
Montenegro	€35 000
Morocco	€76 000
Mozambique	€41 000
Myanmar	€254 000
Namibia	€139 000
Nauru	€16 000
Nepal	€16 000
Netherlands	€3 193 000
New Zealand	€37 000
Nicaragua	€39 000
Niger	€303 000
Nigeria	€151 000
Norway	€452 000
Oman	€30 000
Pakistan	€1 213 000
Palau	€16 000
Panama	€30 000
Papua New Guinea	€16 000
Paraguay	€34 000
Peru	€128 000
Philippines	€170 000
Poland	€208 000
Portugal	€273 000
Qatar	€30 000
Republic of Moldova	€77 000

State	Estimated regular budget cost (€)
Romania	€1 164 000
Russia	€0[(1)]
Rwanda	€16 000
Saint Kitts and Nevis	€16 000
Saint Lucia	€16 000
Saint Vincent and the Grenadines	€16 000
Samoa	€16 000
San Marino	€16 000
Saudi Arabia	€45 000
Senegal	€30 000
Serbia	€131 000
Seychelles	€21 000
Sierra Leone	€16 000
Singapore	€74 000
Slovakia	€674 000
Slovenia	€147 000
Solomon Islands	€16 000
South Africa	€3 246 000
Spain	€1 823 000
Sri Lanka	€30 000
Sudan	€30 000
Suriname	€16 000
Swaziland	€16 000
Sweden	€1 967 000
Switzerland	€2 031 000
Syrian Arab Republic	€188 000
Tajikistan	€209 000
Thailand	€147 000
The Former Yugoslav Republic of Macedonia	€39 000
Togo	€16 000
Tonga	€16 000
Trinidad and Tobago	€16 000
Tunisia	€34 000
Turkey	€357 000
Turkmenistan	€166 000
Tuvalu	€16 000
Uganda	€36 000
Ukraine	€3 303 000
United Arab Emirates	€154 000
United Kingdom of Great Britain and Northern Ireland	€2 340 000
United Republic of Tanzania	€34 000
United States of America	€0[(1)]
Uruguay	€35 000

State	Estimated regular budget cost (€)
Uzbekistan	€831 000
Vanuatu	€24 000
Venezuela, Bolivarian Republic of	€90 000
Viet Nam	€192 000
Yemen	€30 000
Zambia	€30 000
Zimbabwe	€30 000
Total estimation of safeguard cost by States	108 166 000
Costs not allocated to individual States	€16 197 000
Total costs	€124 363 000[2]

(1) Safeguards implementation costs for the Russian Federation and the United States of America were covered by extrabudgetary contribution.
(2) For Taiwan, China costs for safeguards measures applied were reimbursed by contribution to the regular budget.

F.2. Human resources

F.2.1. Staff resources

183. As of 31 December 2014, the total number of regular staff members in the Department of Safeguards was 685 (669): 445 (434) in the Professional category and 240 (235) in the General Service category. In addition, as of 31 December 2014, four (six) consultants, 58 (54) staff members with temporary assistance contracts — 32(27) Professional and 26 (27) General Service — 14 (22) cost-free experts and 25 (21) junior professional officers and other extrabudgetary staff were working in the Department.

184. As of 31 December 2014, the total number of inspectors in the Divisions of Operations was 227 (223). A further 145 (156) Professional staff members in other Divisions were available for inspection purposes.

185. There were 223 (213) inspector-years available in 2014. These data represent the time that inspectors were expected to be available for inspection work. They also take into account the limited availability for inspection of Section Heads and Directors of Operations Divisions, due to their management responsibilities, and of newly recruited inspectors.

F.2.2. Staff training

186. As the knowledge and skills required of its workforce evolve, so does the Agency's training curriculum.

187. In 2014, a total of 6028 person-days of training were provided to Agency staff and personnel from State and regional authorities, of which 4727 (4093) person-days or 78% (80%) were for Agency staff (Table 8). 88 different courses were held, some offered several times during the year, which amounted to a total of 153 (124) training courses, of which 31 (35) were held outside Agency Headquarters.

Table 8 – Training, 2014

Course Categories	Number	Total Trainees (person-days)	Total Agency Instructors (person-days)
Safeguards training	36 (32)	3158 (2725)	380 (369)
Specialized safeguards training	31 (20)	1375 (1221)	232 (272)
Refresher	3 (3)	99 (120)	16 (14)
Others	11 (12)	145 (171)	9 (7)
Individual containment and surveillance training	n/a	70 (61)	50 (48)
Individual non-destructive assay training	n/a	60 (53)	45 (40)
Member States	7 (3)	1121 (779)	152 (92)
Total	**88 (70)**	**6028 (5130)**	**884 (842)**

188. In addition to the training received, in 2014, experienced Agency staff expended 884 (842) person-days delivering training as instructors. Member States (the majority under MSSPs) also provided instructors and access to different types of nuclear facility, as required for various courses. The Introductory Course on Agency Safeguards (ICAS), including two comprehensive inspection exercises at a light water reactor to evaluate the trainees, was held for 18 (18) inspectors. In 2014, the Agency continued updating the ICAS to take the evolution of safeguards implementation in the Department into account. New training material was developed and emphasis was put on enhancing teaching methods by delivering training in a more interactive manner. During the year, the Agency conducted over 140 safeguards training courses to provide safeguards staff with the necessary technical and behavioural competencies, including specialized training as needed. Some of these training courses were held at nuclear facilities to enhance safeguards inspectors' and analysts' practical knowledge on collecting and processing safeguards relevant information, in the field and in HQ, in a consistent and integrated manner. In addition, the Agency developed several new training courses in line with the evolution of safeguards implementation and the development of new types of facility. For example, with the help of MSSPs, the Agency engaged in the development of virtual reality based tools for immersive training. Also, the Safeguards Traineeship Programme was successfully conducted for six trainees from Cambodia, Ghana, Myanmar, Nepal, Tajikistan and Tunisia.

F.3. Support by Member States and outside expert groups

189. MSSPs continued to make substantial contributions (in cash and in kind) to Agency safeguards in 2014. As of 31 December 2014, 20 States[42] and the European Commission had formal support programmes.

190. SAGSI held two series of meetings in 2014, which included consideration of dialogue with States on the State-level concept; internal guidance on preparing State-level safeguards approaches for States with comprehensive safeguards agreements, performing acquisition path analysis, and preparing annual implementation plans; the Safeguards Implementation Report; and a new Departmental initiative on performance indicators.

[42] MSSPs are provided by Argentina, Australia, Belgium, Brazil, Canada, China, Czech Republic, Finland, France, Germany, Hungary, Japan, Netherlands, Republic of Korea, Russian Federation, South Africa, Spain, Sweden, United Kingdom and United States of America.

G. Further Activities Supporting the Nuclear Non-Proliferation Regime

191. Two additional important areas of Agency work, which are not covered by the implementation of safeguards agreements and additional protocols, are relevant to its verification tasks: the voluntary reporting scheme and neptunium and americium monitoring.

G.1. Voluntary reporting scheme

192. As of the end of 2014, 37 States[43] and the European Commission had committed to participating in the voluntary reporting scheme on nuclear material, specified equipment and non-nuclear material. The list of the specified equipment and non-nuclear material to be used for the voluntary reporting scheme is incorporated in the *Model Additional Protocol* (INFCIRC/540 (Corrected), Annex II). Australia, China, and the European Commission reported under the voluntary reporting scheme on the export, import and production of nuclear material and six States[44] reported on the export and import of non-nuclear material and equipment.

G.2. Monitoring neptunium and americium

193. In 1999, the Board of Governors endorsed the implementation of a scheme to monitor separated neptunium and decided that the Director General should report to the Board, when appropriate, on information from States regarding separated americium.[45] Following the Board's decisions, letters were sent to 39 States[46] seeking relevant information about inventories, exports and separation of neptunium and americium, and a commitment to provide annual updates. In the intervening years, the Agency's State evaluation process has evolved to consider all safeguards relevant information available about States, including information on separated neptunium and americium. This information complements the initial reports and the annual reports received from States under the neptunium and americium monitoring scheme.

194. During 2014, the Agency received the requested information from eight States[2, 47] and the European Commission. Evaluation of the information provided by States under the monitoring scheme, in conjunction with information obtained from open and other sources in the course of the State evaluation process, indicates that the quantities of separated neptunium and americium in the non-nuclear-weapon States that are party to the NPT remain small, the elements are being separated in only very small quantities, and only small quantities of the elements are being exported to these States. This evaluation, therefore, does not indicate that a specific proliferation risk currently exists.

---

[43] Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, China, Croatia, Democratic Republic of the Congo, Denmark, Finland, France, Germany, Greece, Hungary, Indonesia, Ireland, Italy, Liechtenstein, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Peru, Poland, Portugal, Republic of Korea, Romania, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States of America.

[44] Reports were received from Denmark, Germany, Liechtenstein, Sweden, United Kingdom and United States of America.

[45] GOV/1999/19/Rev.2.

[46] Letters were sent to Argentina, Armenia, Australia, Azerbaijan, Belarus, Belgium, Brazil, Canada, China, Czech Republic, Estonia, France, Georgia, Germany, India, Indonesia, Israel, Italy, Japan, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Norway, Pakistan, Poland, Russian Federation, Republic of Korea, Republic of Moldova, Spain, Sweden, Switzerland, Tajikistan, Turkmenistan, United Kingdom, United States of America, Ukraine, Uzbekistan and Venezuela. Letters were also sent to the European Commission and Taiwan, China. All States responded except Armenia, Georgia, Kyrgyzstan, Republic of Moldova, Turkmenistan and Venezuela.

[47] Czech Republic, France, Japan, Republic of Korea, Norway, Pakistan, United Kingdom and United States of America.

195. In 2014, flow sheet verification for neptunium was carried out at the European Commission's Institute for Transuranium Elements in Karlsruhe, Germany.

196. The flow sheet verification activities at the Rokkasho and Tokai reprocessing plants in Japan were put on hold due to the shutdown status of these facilities during 2014.

Abbreviations

ABACC	Brazilian-Argentine Agency for the Accounting and Control of Nuclear Material
CANDU	Canadian deuterium uranium [reactor]
DPRK	Democratic People's Republic of Korea
ECAS	Enhancing the capability of the Safeguards Analytical Services
EURATOM	European Atomic Energy Community
IAEA	International Atomic Energy Agency
ICR	inventory change report
INFCIRC	Information Circular
LOF	location outside facilities where nuclear material is customarily used
MBA	material balance area
MBR	material balance report
MOSAIC	Modernization of Safeguards Information Technology
MSSP	Member State Support Programme
NML	Nuclear Material Laboratory (Seibersdorf)
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NWAL	Network of Analytical Laboratories
PIL	physical inventory listing
SAGSI	Standing Advisory Group on Safeguards Implementation
SQP	small quantities protocol

Appendix I. Data on Safeguards Activities — Aggregated for All States

1. Data regarding safeguards activities in 2014 set out below are aggregated for all States.[1, 2]

I.1. Facilities, LOFs and material under Agency safeguards

2. At the end of 2014, 193 467 (188 500) significant quantities of declared nuclear material were under safeguards in 1267 (1264) facilities and MBAs containing LOFs. Of these 1267 facilities and MBAs containing LOFs, 578 (583) — containing more than 98.8% (99.5%) of the total material — were inspected in 2014.

3. As of 31 December 2014, the 1267 (1264) facilities and MBAs containing LOFs under Agency safeguards were:

- 250 (252) power reactors — 214 (213) light water reactors, 31 (28) on-load refuelled reactors and 5 (11) other type reactors;
- 154 (151) facilities with research reactors and critical assemblies;
- 93 (96) bulk handling facilities: 18 (18) conversion plants, 20 (19) enrichment plants, 45 (46) fuel fabrication plants, ten (13) reprocessing plants;
- 131 (126) separate storage facilities
- 76 (74) other-type facilities (including 12 associated with enrichment or reprocessing technology); and
- 563 (565) MBAs containing LOFs with small amounts of nuclear material (including 11 associated with enrichment or reprocessing technology).

4. Figure I.1 shows that the number of facilities and MBAs containing LOFs under Agency safeguards rose by 8% to 1267 in 2014, compared to 2010. This increase was predominantly caused by an increase in the number of MBAs containing LOFs[48].

5. At the end of 2014, on the basis of States' nuclear material accounting reports, 193 467 (188 500) significant quantities of nuclear material were declared to the Agency, an increase of 12% compared to 2010. Of this total, 157 754 (153 582) significant quantities were in States[2] with comprehensive safeguards agreements, 3037 (2917) significant quantities in States with INFCIRC/66/Rev.2-type agreements and 32 676 (32 001) significant quantities in facilities selected in States with voluntary offer agreements.

6. Data are presented below according to material type under safeguards:

- 12 329 (12 316) significant quantities of unirradiated plutonium, including fresh mixed oxide fuel, outside reactor cores;
- 149 284 (145 411) significant quantities of plutonium contained in irradiated fuel and in fuel elements in reactor cores; [49]

---

[48] A number of MBAs containing LOFs were created in 2012 and then closed during 2013 as a result of the exemption of small amounts of nuclear material in non-nuclear activities at LOFs in one State. These LOFs were included in the 2012 totals but are not included in the 2013 totals.

[49] This amount includes an estimated 11 110 (10 772) significant quantities of plutonium contained in irradiated fuel assemblies in reactor cores which, under the agreed reporting procedures, had not yet been separately reported to the Agency.

- 193 (191) significant quantities of high enriched uranium and 18 (18) significant quantities of uranium-233;
- 18 605 (18 029) significant quantities of low enriched uranium; and
- 13 038 (12 535) significant quantities of thorium and depleted and natural uranium.

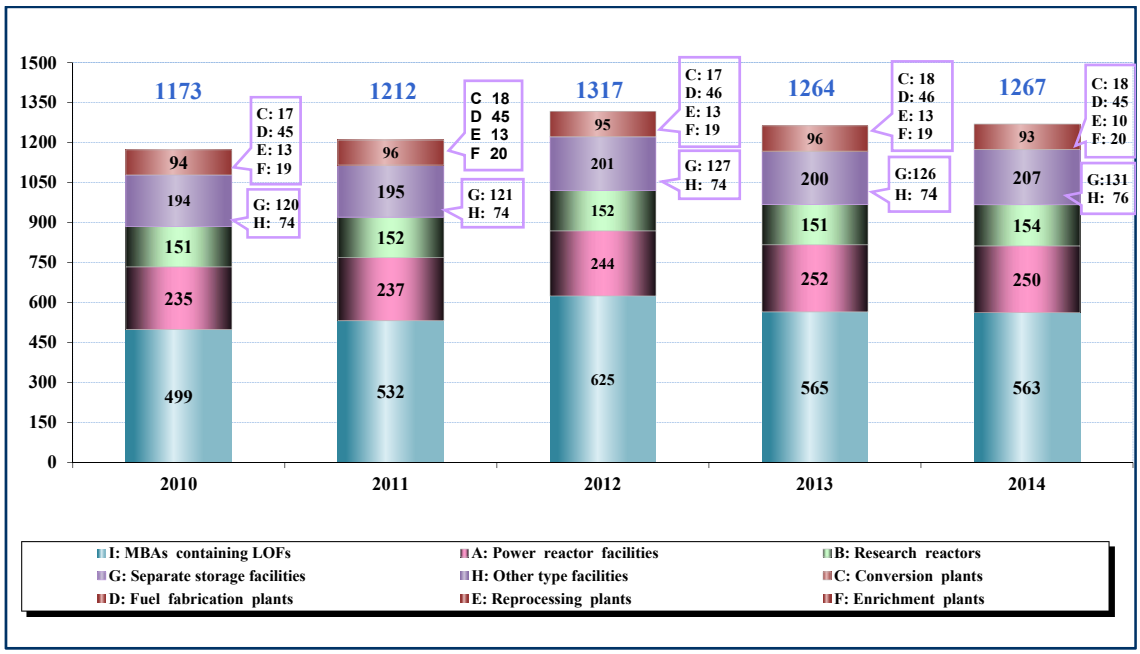

Figure I.1. Facilities[50] and MBAs containing LOFs under Agency safeguards, 2010–2014

7. Figure I.2 shows that the number of significant quantities of nuclear material increased by 12% in 2014 compared to 2010. Safeguards were also applied to 432 (431) tonnes of heavy water.

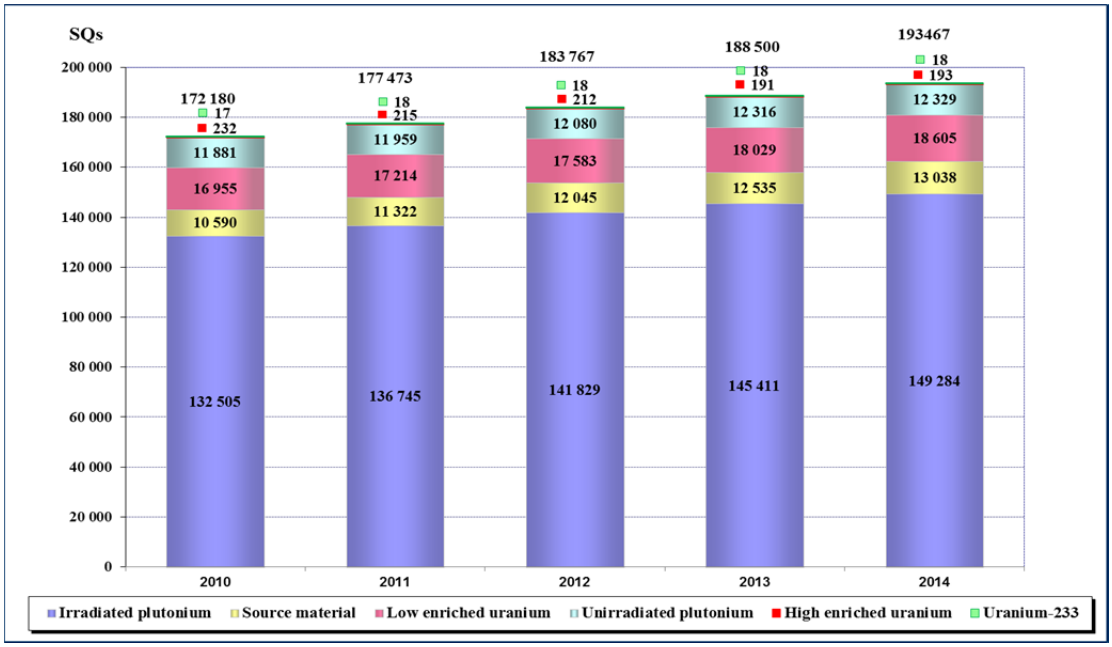

Figure I.2. Significant quantities of nuclear material under Agency safeguards, 2010–2014

[50] The facilities in Figure I.1. are categorized as per GOV/INF/361.

I.2. Safeguards agreement reporting and verification activities

8. The following accounting reports were received by the Agency in 2014:

- 961 496 (696 740) inventory change reports.
- 1254 (1157) physical inventory listings.
- 1230 (1186) material balance reports.

9. Data regarding verification activities carried out in 2014 are as follows:

- 2114 (1969) inspections and 618 (573) design information verifications were performed at 578 (583) facilities and LOFs representing 12 590.5 (11 653) calendar days in the field for verification.
- 1478 (1685) surveillance recording media items were reviewed.
- Agency seals:
  - 13 081 (13 520) metal seals applied to nuclear material or Agency safeguards equipment were detached and subsequently verified at Headquarters; and
  - 5207 (5859) seals of other types, including 1836 (1531) COBRA seals, 414 (664) VACOSS seals, 926 (960) EOSS seals and 2031 (2704) other electronic seals.
- IAEA-EURATOM common seals:
  - 3028 (3819) IAEA-EURATOM common metal seals applied to nuclear material or Agency safeguards equipment were detached and subsequently verified at Luxembourg; and
  - 800 (915) IAEA-EURATOM common COBRA seals, 525 (840) IAEA-EURATOM common VACOSS electronic seals and 526 (377) IAEA-EURATOM common EOSS seals.
- 254 (335) environmental swipe samples and 85 (48) samples for other analysis were collected in 2014.
- The Agency dispatched:
  - 1458 (1470) statements on the results of inspections and remote monitoring activities (90(a) statements);
  - 522 (504) statements on conclusions (90(b) statements);
  - 69 (65) safeguards transfer agreement letters (to States with INFCIRC/66/Rev.2-type agreements);
  - 551 (557) design information verification acknowledgement letters;
  - 106 (108) book inventories of nuclear material; and
  - 192 (196) transit matching reports.

I.3. Additional protocol reporting and verification activities

10. Since 2010, the number of States with additional protocols in force has increased by 25% and the number of additional protocol declarations evaluated by the Agency has increased by 11%. During 2014, 2141 (2124) declarations were received from 104 (99) States[2] and the European Commission.

11. Since 2010, the number of complementary accesses has fluctuated according to the Agency's need to clarify its knowledge on States. Data regarding the implementation of additional protocol activities in 2014 are as follows:

- 78 (71) complementary accesses were conducted in 23 (24) States[2] representing 143.5 (124) calendar-days in the field for verification.
- 54 (36) environmental swipe samples and 23 (four) samples for other analysis were taken during complementary access in 13 (14) States and four (two) States, respectively.
- The Agency dispatched:
  - 68 (58) statements on the activities carried out under the additional protocol (10.a. statements);
  - four (six) statements on the results of activities in respect of questions or inconsistencies that the Agency brought to the attention of a State (10.b. statements); and
  - 17 (16) statements on conclusions drawn from additional protocol activities (10.c. statements).

Appendix II. Data on Safeguards Activities — by Group and by State

Group 1: States with both comprehensive safeguards agreements and additional protocols in force, with the broader conclusion and integrated safeguards implemented throughout 2014

Table II.1 – Amount of nuclear material, in significant quantities, under Agency safeguards at the end of 2014

Unirradiated plutonium	Unirradiated high enriched uranium	Unirradiated uranium-233	Irradiated plutonium	Irradiated high enriched uranium	Irradiated uranium-233	Low enriched uranium	Natural uranium	Depleted uranium	Thorium	Total significant quantities
1978	**36**	**1**	**120 451**	**98**	**17**	**16 071**	**3382**	**6086**	**2**	**148 122**

Note: Heavy water under safeguards: <1 tonne. Significant quantity figures rounded to the nearest integer.

Table II.2 – Summary of facility based verification activities by installation category in 2014

	Power reactors	Research reactors	Conversion plants	Fuel fabrication plants	Reprocessing plants	Enrichment plants	Separate storage facilities	Other facilities	Material balance areas containing LOFs	Total
Number of facilities and MBAs containing LOFs under safeguards	211	102	7	28	9	6	99	52	469	**983**
Number of facilities and LOFs inspected	172	48	7	21	7	5	66	30	45	**401**
Number of inspections	563	153	31	113	41	70	214	71	49	**1305**
Number of design information verification visits	132	50	8	19	7	5	66	30	5	**322**
Number of person-days of inspection	1217	295	192	696	471	298	453	161	86	**3869**

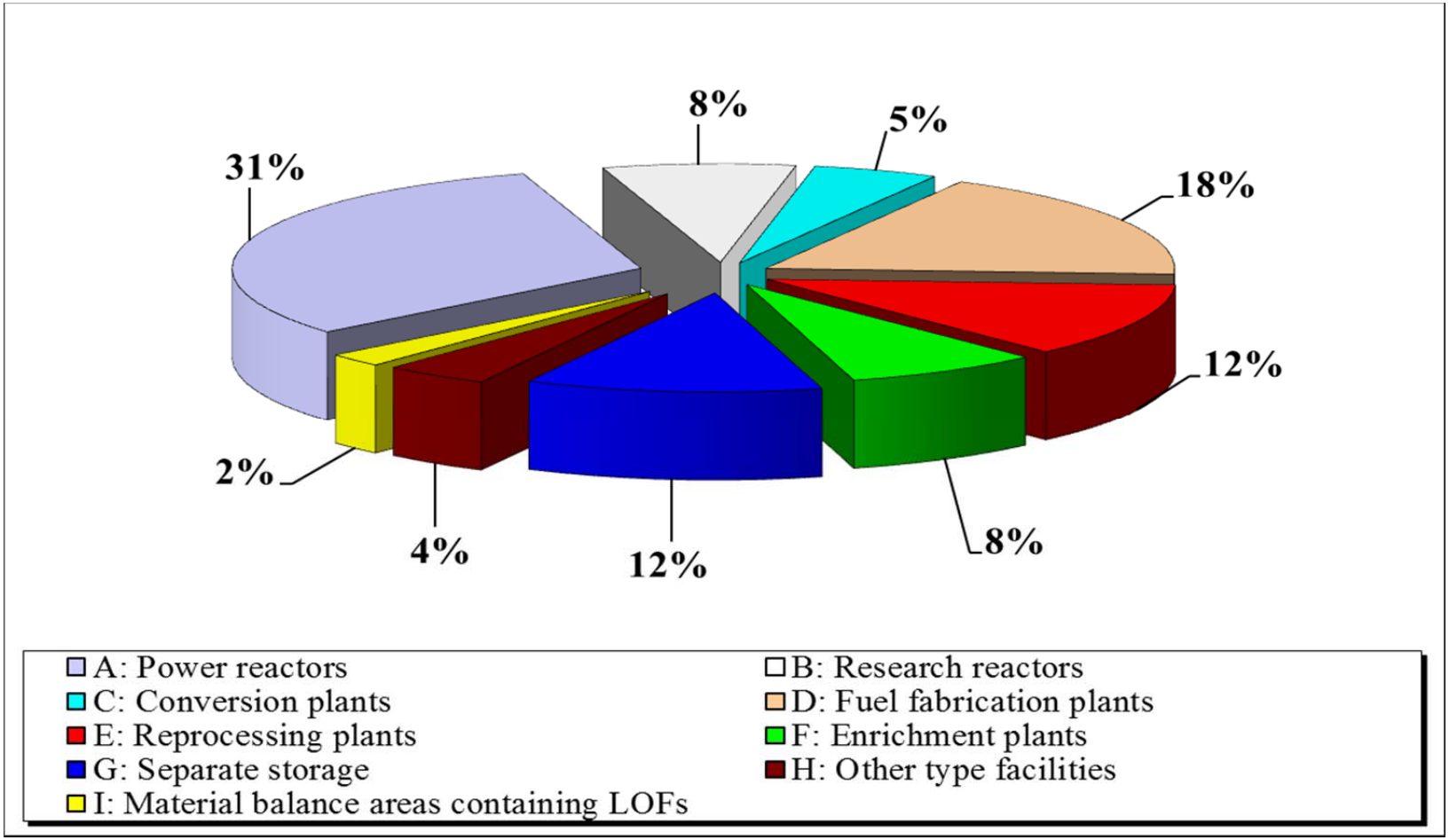

Figure II.1. Distribution of inspection effort (person-days of inspection) by facility category for States with comprehensive safeguards agreement, broader conclusion, additional protocol and integrated safeguards the whole year

Table II.3 – Verification activities in 2014

States	Facilities under safeguards	Material balance areas containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Number of complementary accesses	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received	Number of additional protocol declarations received in 2014
Armenia	3	1	2	5	2	0	12	23	204	3	3	15
Australia	7	1	3	5	2	1	11	34	961	5	6	53
Austria	1	6	1	1	0	0	1	1	151	7	6	26
Bangladesh	1	1	0	0	0	0	0	0	0	1	1	14
Belgium	23	8	22	133	23	0	186	244.5	26 196	29	29	22
Bulgaria	6	3	5	15	6	0	23	47	1646	9	9	16
Burkina Faso	0	1(1)	0	0	0	0	0	0	0	0	0	13
Canada	34	8	28	161	22	6	458	818	7528	49	49	40
Chile	4	1	5	5	5	0	10	18	25	6	7	13
Croatia	0	1(1)	0	0	0	0	0	0	0	0	0	30
Cuba	0	2	0	0	0	0	0	0	0	0	0	16
Czech Republic	12	2	9	34	11	2	49	80.5	4322	15	15	23
Denmark(2)	4	5	0	0	0	0	0	0	80	6	6	38
Ecuador	0	1(1)	0	0	0	0	0	0	0	0	0	12
Estonia	1	1	0	0	0	0	0	0	10	2	2	14
Finland	10	3	5	17	6	0	29	62	2165	7	7	26
Germany	70	81	47	185	42	8	338	671.5	39 271	127	124	77
Ghana	1	0	0	0	0	0	0	0	0	1	1	13
Greece	1	5	0	0	0	0	0	0	9	4	4	18
Holy See	0	1(1)	0	0	0	0	0	0	0	0	0	15
Hungary	6	2	5	19	4	0	35	64	3348	11	11	23

States	Facilities under safeguards	Material balance areas containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Number of complementary accesses	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received	Number of additional protocol declarations received in 2014
Iceland	0	1[(1)]	0	0	0	0	0	0	0	0	0	13
Indonesia	7	1	4	5	4	2	14	37.5	174	8	8	17
Ireland	0	2	0	0	0	0	0	0	0	1	1	15
Italy	24	25	13	18	10	0	19	46.5	800	38	37	29
Jamaica	1	1	1	1	1	0	2	12	1	2	2	15
Japan	125	202	102	315	62	19	1467	2745	27 527	333	333	222
Korea, Republic of	44	2	32	60	19	4	439	642.5	7841	39	39	24
Latvia	1	2	1	1	0	0	1	3	1	1	1	17
Libya	2	1	2	2	2	1	4	8	0	4	4	23
Lithuania	4	19	6	10	3	0	25	41	38	15	14	22
Luxembourg	0	2	0	0	0	0	0	0	0	0	0	13
Madagascar	0	1[(1)]	0	0	0	0	0	0	0	0	0	13
Mali	0	1[(1)]	0	0	0	0	0	0	0	0	0	14
Malta	0	1	1	1	0	0	1	3	0	0	0	13
Monaco	0	1[(1)]	0	0	0	0	0	0	0	0	0	13
Netherlands	9	9	7	48	8	1	130	222.5	25 413	22	21	23
Norway	3	1	3	5	3	1	14	28	166	5	5	13
Palau	0	1[(1)]	0	0	0	0	0	0	0	0	0	0
Peru	2	0	2	2	2	0	4	8	0	2	2	14
Poland	3	4	3	6	1	1	11	25	1240	6	6	17
Portugal	2	1	2	2	2	0	2	4	3	3	3	14
Romania	9	1	8	32	7	1	83	137.5	81 412	8	8	16
Seychelles	0	1[(1)]	0	0	0	0	0	0	0	0	0	14
Singapore	0	1[(1)]	0	0	0	0	0	0	0	0	0	14

States	Facilities under safeguards	Material balance areas containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Number of complementary accesses	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received	Number of additional protocol declarations received in 2014
Slovakia	7	1	5	15	7	0	19	31.5	2163	8	8	17
Slovenia	2	13	1	2	1	0	2	6	150	7	6	14
Spain	15	13	16	55	14	1	100	191.5	5928	25	23	27
Sweden	17	10	15	47	16	1	100	190	24 153	26	25	24
The Former Yugoslav Republic of Macedonia	0	1[(1)]	0	0	0	0	0	0	6	1	0	26
Ukraine	34	8	27	67	24	0	210	303.5	3933	38	38	22
Uruguay	0	1	0	0	0	0	0	0	0	0	0	14
Uzbekistan	2	6	6	8	2	9	25	102	100	1	1	13
Total for 53 States	**497**	**468**	**389**	**1282**	**311**	**58**	**3824**	**6851.5**	**266 965**	**875**	**865**	**1262**
Taiwan, China	17	1	12	23	11	1	45	112	3024	14	14	19
TOTAL for States and Taiwan, China	**514**	**469**	**401**	**1305**	**322**	**59**	**3869**	**6963.5**	**269 989**	**889**	**879**	**1281**
TOTAL for EURATOM States[(3)]	**227**	**219**	**172**	**641**	**161**	**15**	**1154**	**2072**	**218 499**	**377**	**366**	**544**

[(1)] Material balance areas in States with SQPs based on the revised standard model.
[(2)] Includes additional protocol declarations submitted by Denmark with regard to Greenland.
[(3)] In addition to 544 additional protocol declarations for Euratom States, there are 17 additional protocol declarations for locations of the European Commission.

Group 2: States with both comprehensive safeguards agreements and additional protocols in force, with the broader conclusion, where integrated safeguards were not implemented during 2014

Table II.4 – Amount of nuclear material, in significant quantities, under Agency safeguards at the end of 2014

Unirradiated plutonium	Unirradiated high enriched uranium	Unirradiated uranium-233	Irradiated plutonium	Irradiated high enriched uranium	Irradiated uranium-233	Low enriched uranium	Natural uranium	Depleted uranium	Thorium	Total significant quantities
0	**6**	**0**	**1735**	**44**	**0**	**430**	**37**	**27**	**10**	**2290**

Note: Significant quantity figures rounded to the nearest integer.

Table II.5 – Summary of facility based verification activities by installation category in 2014

	Power reactors	Research reactors	Conversion plants	Fuel fabrication plants	Reprocessing plants	Enrichment plants	Separate storage facilities	Other facilities	Material balance areas containing LOFs	Total
Number of facilities and MBAs containing LOFs under safeguards	8	9	2	4	0	0	12	3	13	**51**
Number of facilities and LOFs inspected	3	9	2	4	0	0	9	3	6	**36**
Number of inspections	8	20	13	17	0	0	35	6	8	**107**
Number of design information verifications	5	7	2	4	0	0	10	3	1	**32**
Number of person-days of inspection	38	98	38	116	0	0	90	17	22	**419**

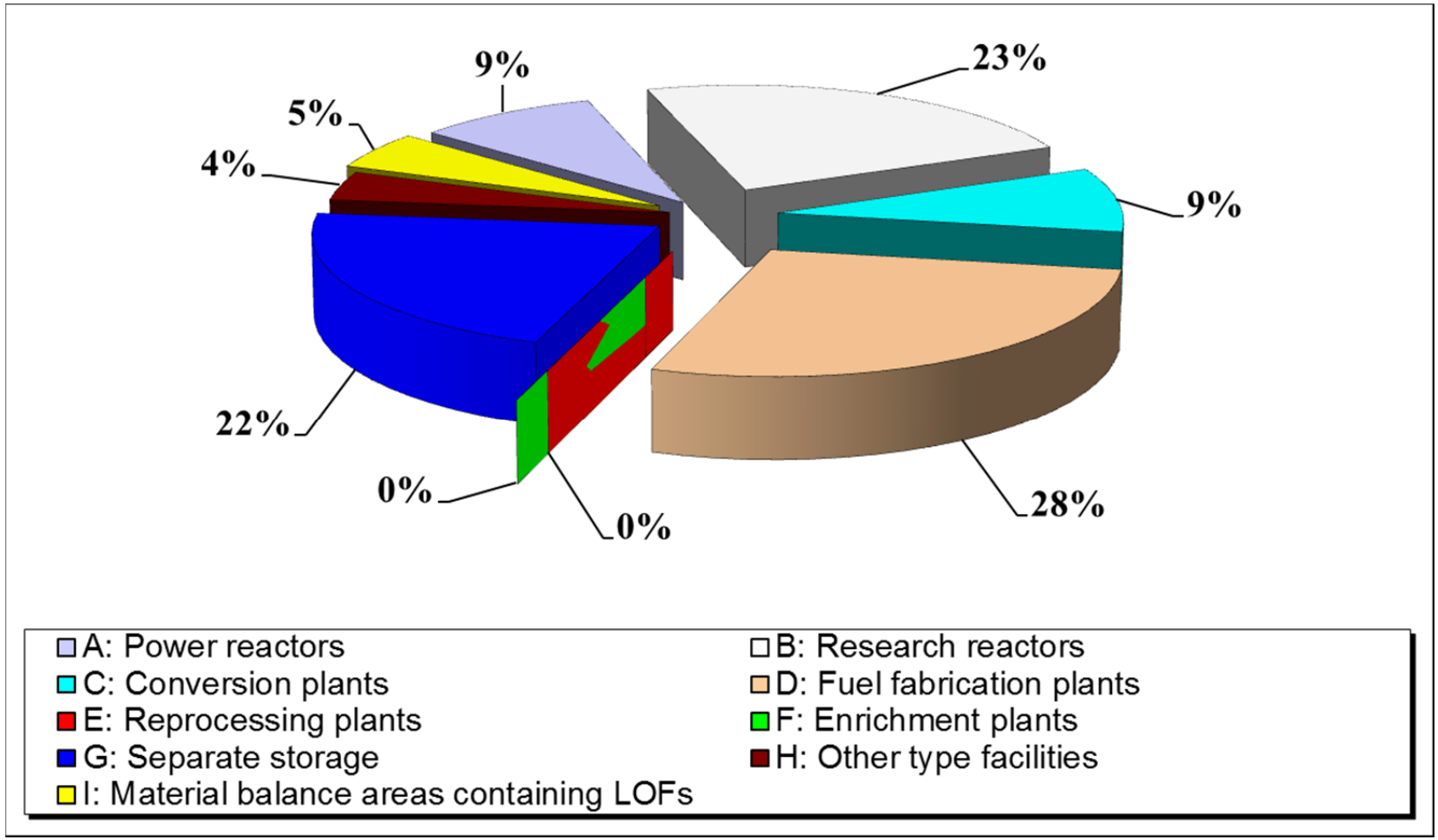

Figure II.2. Distribution of inspection effort (person-days of inspection) by facility category for States with comprehensive safeguards agreement, additional protocol with broader conclusion, and no integrated safeguards

Table II.6 – Verification activities in 2014

States	Facilities under safeguards	Material balance areas containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Number of complementary accesses	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received	Number of additional protocol declarations received in 2014
Albania	0	1	1	1	0	0	2	6	0	1	1	14
Andorra	0	1[(1)]	0	0	0	0	0	0	0	0	0	14
Botswana	0	1	0	0	0	0	0	0	0	1	1	12
Jordan	0	0	0	0	0	0	0	0	0	0	0	15
Kazakhstan	10	1	9	23	7	6	187	367.5	2158	14	14	23
Kuwait	0	1[(1)]	0	0	0	0	0	0	0	0	0	14
Mauritius	0	1[(1)]	0	0	0	0	0	0	0	0	0	14
New Zealand	0	1[(1)]	0	0	0	0	0	0	30	1	0	21
Philippines	2	1	2	2	2	0	8	15	40	4	4	13
South Africa	18	3	19	75	19	0	211	362	1291	20	20	19
Turkey	3	1	4	5	3	2	10	13	36	4	4	24
Viet Nam	5	1	1	1	1	3	1	21	29	2	2	17
Total for 12 States	**38**	**13**	**36**	**107**	**32**	**11**	**419**	**784.5**	**3584**	**47**	**46**	**200**

[(1)] Material balance areas in States with SQPs based on the revised standard model.

Group 3: States with both comprehensive safeguards agreements and additional protocols in force, without the broader conclusion

Table II.7 – Amount of nuclear material, in significant quantities, under Agency safeguards at the end of 2014

Unirradiated plutonium	Unirradiated high enriched uranium	Unirradiated uranium-233	Irradiated plutonium	Irradiated high enriched uranium	Irradiated uranium-233	Low enriched uranium	Natural uranium	Depleted uranium	Thorium	Total significant quantities
4	**0**	**0**	**3254**	**0**	**0**	**394**	**21**	**75**	**0**	**3748**

Note: Significant quantity figures rounded to the nearest integer.

Table II.8 – Summary of facility based verification activities by installation category in 2014

	Power reactors	Research reactors	Conversion plants	Fuel fabrication plants	Reprocessing plants	Enrichment plants	Separate storage facilities	Other facilities	Material balance areas containing LOFs	Total
Number of facilities and MBAs containing LOFs under safeguards	7	10	1	0	0	0	4	4	42	**68**
Number of facilities and LOFs inspected	7	8	1	0	0	0	3	3	10	**32**
Number of inspections	31	8	1	0	0	0	15	4	10	**69**
Number of design information verifications	7	9	1	0	0	0	3	3	2	**25**
Number of person-days of inspection	53	16	2	0	0	0	22	9	34	**136**

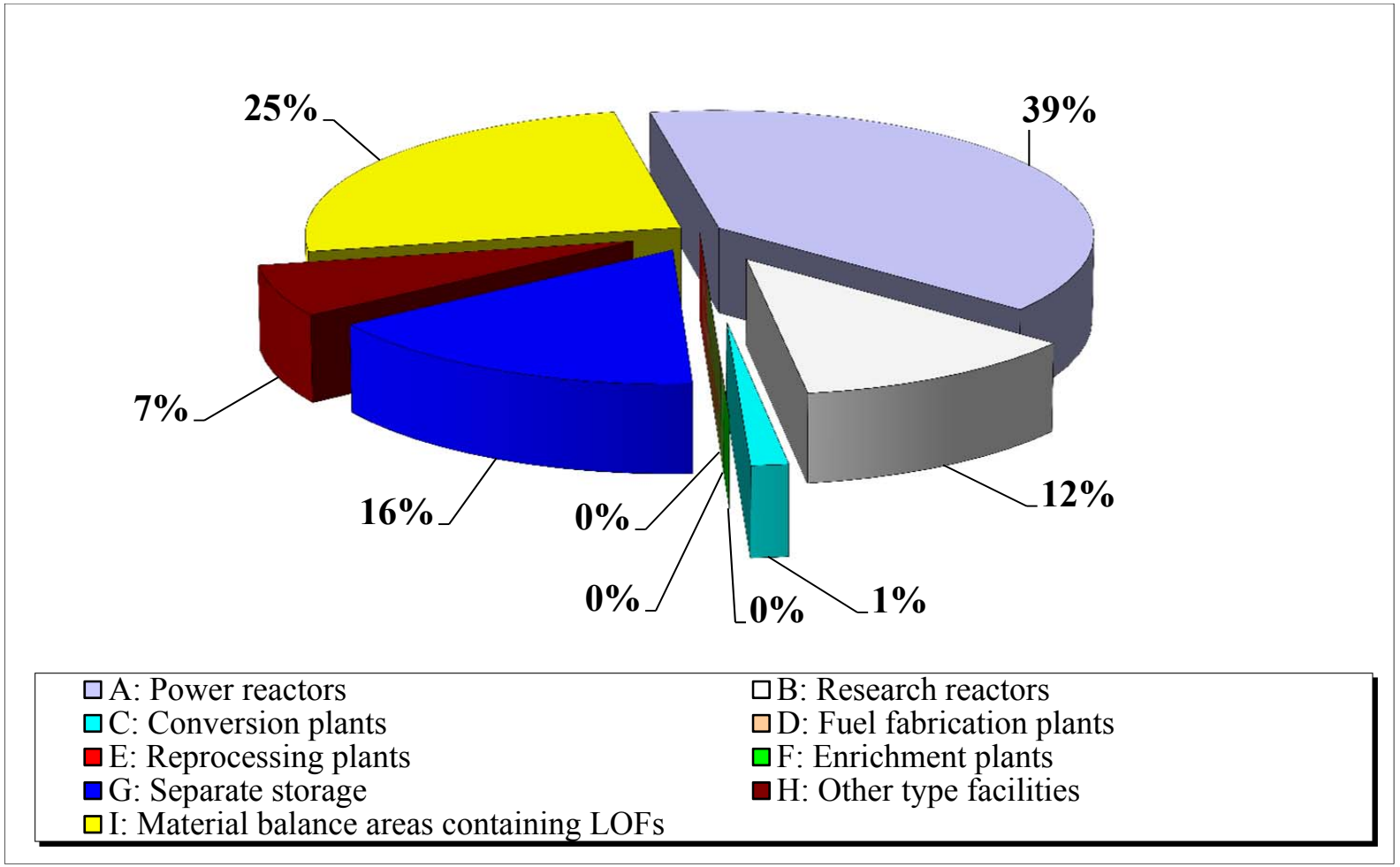

Figure II.3. Distribution of inspection effort (person-days of inspection) by facility category for States with comprehensive safeguards agreement and additional protocol, without broader conclusion

Table II.9 – Verification activities in 2014

States	Facilities under safeguards	Material balance areas containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Number of complementary accesses	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received	Number of additional protocol declarations received in 2014
Afghanistan	0	0	0	0	0	0	0	0	0	0	0	16
Angola	0	1(1)	0	0	0	0	0	0	0	0	0	0
Antigua and Barbuda	0	1(1)	0	0	0	0	0	0	0	0	0	0
Azerbaijan	0	1(1)	0	0	0	0	0	0	0	0	0	34
Bahrain	0	1 (1)	0	0	0	0	0	0	0	0	0	0
Bosnia and Herzegovina	0	1	1	1	0	0	1	2.5	3	3	2	34
Burundi	0	1(1)	0	0	0	0	0	0	0	0	0	0
Central African Republic	0	1(1)	0	0	0	0	0	0	0	0	0	26
Chad	0	1(1)	0	0	0	0	0	0	0	0	0	14
Colombia	1	1	2	2	2	0	4	6	0	0	0	15
Comoros	0	1(1)	0	0	0	0	0	0	0	0	0	0
Congo	0	1(1)	0	0	0	0	0	0	0	0	0	0
Costa Rica	0	1(1)	0	0	0	0	0	0	0	0	0	0
Cyprus	0	1	1	1	0	0	1	3	8	2	2	26
Democratic Republic of the Congo	1	0	1	1	1	0	2	12	11	1	1	27
Dominican Republic	0	1(1)	0	0	0	0	0	0	0	0	0	8
El Salvador	0	1(1)	0	0	0	0	0	0	0	1	0	15
Fiji	0	0	0	0	0	0	0	0	0	0	0	0

States	Facilities under safeguards	Material balance areas containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Number of complementary accesses	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received	Number of additional protocol declarations received in 2014
Gabon	0	1[(1)]	0	0	0	0	0	0	0	0	0	16
Gambia	0	1[(1)]	0	0	0	0	0	0	0	0	0	0
Georgia	3	1	3	3	2	0	6	12	25	4	4	16
Guatemala	0	1[(1)]	0	0	0	0	0	0	0	0	0	0
Haiti	0	0	0	0	0	0	0	0	0	0	0	0
Iraq	1	1	0	0	0	0	0	0	30	2	2	16
Kenya	0	1[(1)]	0	0	0	0	0	0	0	2	0	13
Kyrgyzstan	0	0	0	0	0	2	0	14.5	0	0	0	1
Lesotho	0	1[(1)]	0	0	0	0	0	0	0	0	0	12
Malawi	0	1[(1)]	0	0	0	0	0	0	0	0	0	11
Marshall Islands	0	0	0	0	0	0	0	0	0	0	0	0
Mauritania	0	1[(1)]	0	0	0	0	0	0	0	0	0	0
Mexico	4	2	5	9	5	1	20	32	652	5	5	17
Mongolia	0	0	0	0	0	0	0	0	0	0	0	14
Montenegro	0	1[(1)]	0	0	0	0	0	0	0	0	0	16
Morocco	1	1	2	2	1	0	4	2	1	2	2	12
Mozambique	0	1[(1)]	0	0	0	0	0	0	0	0	0	0
Namibia	0	0	0	0	0	2	0	8	0	0	0	8
Nicaragua	0	1[(1)]	0	0	0	0	0	0	0	0	0	28
Niger	0	1	1	1	0	2	2	13	1	1	1	13
Nigeria	1	1	1	1	1	0	2	5	0	1	1	13
Panama	0	1[(1)]	0	0	0	0	0	0	0	0	0	0
Paraguay	0	0	0	0	0	0	0	0	0	0	0	13

States	Facilities under safeguards	Material balance areas containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Number of complementary accesses	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received	Number of additional protocol declarations received in 2014
Republic of Moldova	0	1[(1)]	1	1	0	0	4	7	0	0	0	14
Rwanda	0	1[(1)]	0	0	0	0	0	0	0	0	0	0
Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0
Swaziland	0	1[(1)]	0	0	0	0	0	0	0	0	0	0
Switzerland	13	1	12	45	12	0	72	123.5	1251	14	14	24
Tajikistan	1	1	1	1	1	1	6	24	1	1	1	13
Togo	0	0	0	0	0	0	0	0	0	0	0	0
Turkmenistan	0	1	1	1	0	0	12	23	0	1	0	16
Uganda	0	1[(1)]	0	0	0	0	0	0	0	0	0	15
United Arab Emirates.	0	0	0	0	0	0	0	0	0	0	0	17
United Republic of Tanzania	0	1[(1)]	0	0	0	0	0	0	0	0	0	13
Vanuatu	0	1[(1)]	0	0	0	0	0	0	0	1	0	23
Total for 53 States	**26**	**42**	**32**	**69**	**25**	**8**	**136**	**287.5**	**1983**	**41**	**35**	**569**

[(1)] MBAs in States with SQPs based on the revised standard text.

Group 4: States with comprehensive safeguards agreements in force but without additional protocols in force

Table II.10 – Amount of nuclear material, in significant quantities, under Agency safeguards at the end of 2014

Unirradiated plutonium	Unirradiated high enriched uranium	Unirradiated uranium-233	Irradiated plutonium	Irradiated high enriched uranium	Irradiated uranium-233	Low enriched uranium	Natural uranium	Depleted uranium	Thorium	Total significant quantities
0	**5**	**0**	**3022**	**2**	**0**	**220**	**102**	**243**	**0**	**3594**

Note: Significant quantity figures rounded to the nearest integer.

Table II.11 – Summary of facility based verification activities by installation category in 2014

	Power reactors	Research reactors	Conversion plants	Fuel fabrication plants	Reprocessing plants	Enrichment plants	Separate storage facilities	Other facilities	Material balance areas containing LOFs	Total
Number of facilities and MBAs containing LOFs under safeguards	11	29	8	10	0	11	10	17	34	**130**
Number of facilities and LOFs inspected	6	17	7	10	0	11	6	16	6	**79**
Number of inspections	29	52	48	58	0	244	8	44	6	**489**
Number of design information verifications	13	43	24	34	0	47	6	41	2	**210**
Number of person-days of inspection	262	100	100	184	0	1490	15	40	16	**2207**

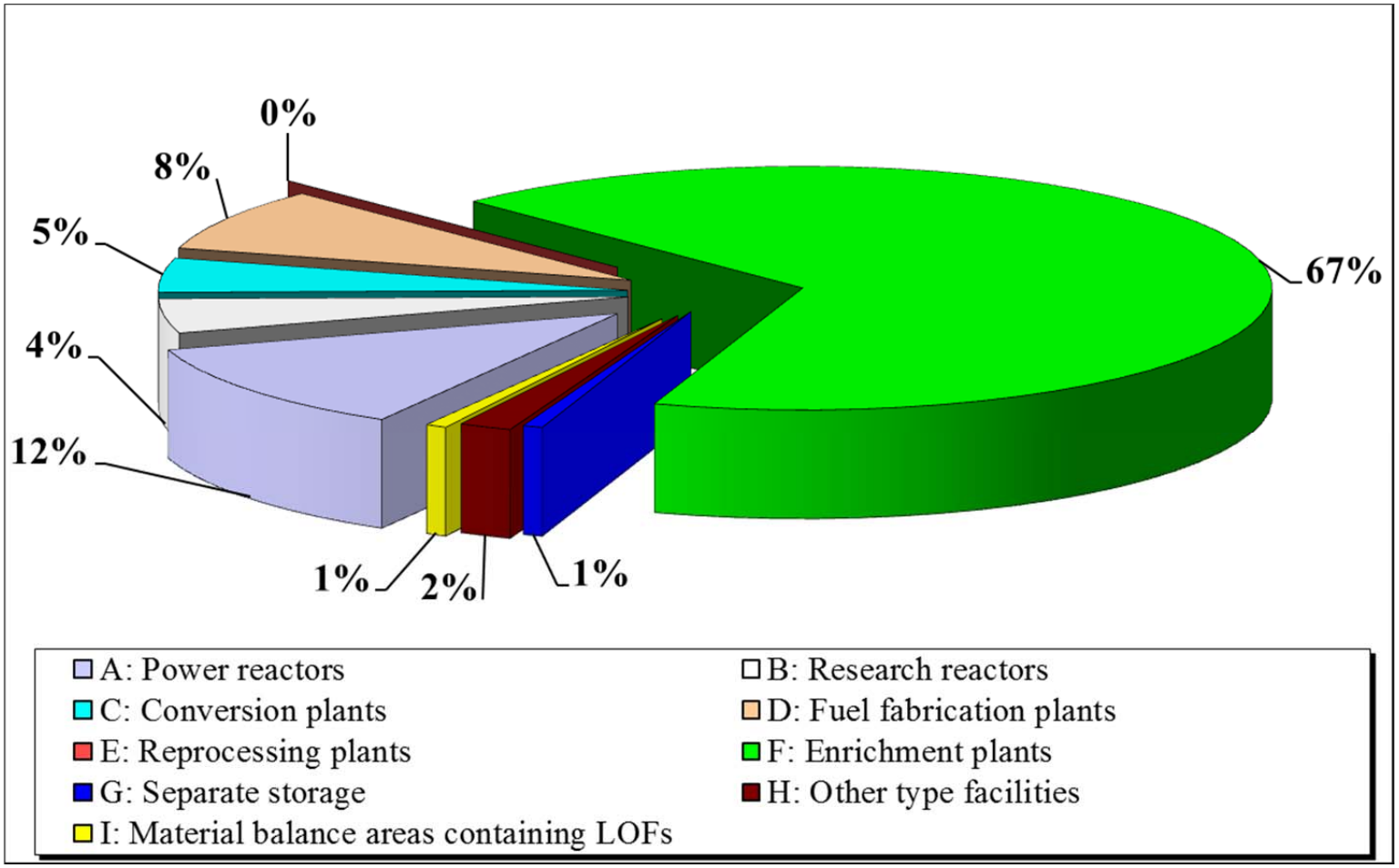

Figure II.4. Distribution of inspection effort (person-days of inspection) by facility category for States with comprehensive safeguards agreement without additional protocol

Table II.12 – Verification activities in 2014

States	Facilities under safeguards	MBAs containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received
Algeria	5	1	6	8	5	22	24	1031	8	8
Argentina	34	13	27	43	33	247	486.5	1309	46	45
Bahamas	0	1(1)	0	0	0	0	0	0	0	0
Barbados	0	0	0	0	0	0	0	0	0	0
Belarus	4	2	2	14	4	41	79	189	3	3
Belize	0	0	0	0	0	0	0	0	0	0
Bhutan	0	0	0	0	0	0	0	0	0	0
Bolivia	0	0	0	0	0	0	0	0	0	0
Brazil	22	4	16	43	19	167	366.5	1318	34	33
Brunei Darussalam	0	0	0	0	0	0	0	0	0	0
Cambodia	0	1(1)	0	0	0	0	0	0	1	0
Cameroon	0	0	0	0	0	0	0	0	0	0
Côte D'Ivoire	0	0	0	0	0	0	0	0	0	0
Dominica	0	0	0	0	0	0	0	0	0	0
Egypt	7	1	7	15	12	28	42	51	10	10
Ethiopia	0	0	0	0	0	0	0	0	0	0
Grenada	0	0	0	0	0	0	0	0	0	0
Guyana	0	0	0	0	0	0	0	0	0	0
Honduras	0	1(1)	0	0	0	0	0	0	1	0
Iran, Islamic Republic of	18	1	16	361	133	1692	2229.5	5791	20	20
Kiribati	0	0	0	0	0	0	0	0	0	0
Lao People's Democratic Republic	0	0	0	0	0	0	0	0	0	0

States	Facilities under safeguards	MBAs containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received
Lebanon	0	1[(1)]	0	0	0	0	0	0	0	0
Liechtenstein	0	0	0	0	0	0	0	0	0	0
Malaysia	1	0	1	1	1	2	11	0	1	1
Maldives	0	0	0	0	0	0	0	0	0	0
Myanmar	0	0	0	0	0	0	0	0	0	0
Nauru	0	0	0	0	0	0	0	0	0	0
Nepal	0	0	0	0	0	0	0	0	0	0
Oman	0	0	0	0	0	0	0	0	0	0
Papua New Guinea	0	0	0	0	0	0	0	0	0	0
Qatar	0	1[(1)]	0	0	0	0	0	0	0	0
Saint Lucia	0	0	0	0	0	0	0	0	0	0
Saint Vincent and the Grenadines	0	0	0	0	0	0	0	0	0	0
Samoa	0	0	0	0	0	0	0	0	0	0
San Marino	0	1[(1)]	0	0	0	0	0	0	0	0
Saudi Arabia	0	0	0	0	0	0	0	0	0	0
Senegal	0	1[(1)]	0	0	0	0	0	0	1	0
Serbia	1	2	2	2	1	4	6	3	4	4
Sierra Leone	0	0	0	0	0	0	0	0	0	0
Solomon Islands	0	0	0	0	0	0	0	0	0	0
Sri Lanka	0	0	0	0	0	0	0	0	0	0
Sudan	0	0	0	0	0	0	0	0	0	0
Suriname	0	0	0	0	0	0	0	0	0	0
Syrian Arab Republic	1	1	0	0	0	0	0	0	1	1

States	Facilities under safeguards	MBAs containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received
Thailand	2	1	1	1	1	2	9	26	2	2
Tonga	0	0	0	0	0	0	0	0	0	0
Trinidad and Tobago	0	0	0	0	0	0	0	0	0	0
Tunisia	0	0	0	0	0	0	0	0	0	0
Tuvalu	0	0	0	0	0	0	0	0	0	0
Venezuela, Bolivarian Republic of	1	0	1	1	1	2	4	0	0	0
Yemen	0	0	0	0	0	0	0	0	0	0
Zambia	0	0	0	0	0	0	0	0	0	0
Zimbabwe	0	1[(1)]	0	0	0	0	0	0	0	0
Total for 54 States	**96**	**34**	**79**	**489**	**210**	**2207**	**3257.5**	**9718**	**132**	**127**
Total for ABACC States	**56**	**17**	**43**	**86**	**52**	**414**	**853**	**2627**	**80**	**78**

[(1)] MBAs in States with SQPs based on the revised standard model.

Group 5: States with safeguards agreements based on INFCIRC/66/Rev.2 in force

Table II.13 – Amount of nuclear material, in significant quantities, under Agency safeguards at the end of 2014

Unirradiated plutonium	Unirradiated high enriched uranium	Unirradiated uranium-233	Irradiated plutonium	Irradiated high enriched uranium	Irradiated uranium-233	Low enriched uranium	Natural uranium	Depleted uranium	Thorium	Total significant quantities
5	**1**	**0**	**2223**	**1**	**0**	**198**	**589**	**21**	**0**	**3037**

Note: Heavy water under safeguards: 431 tonnes. Significant quantity figures rounded to the nearest integer.

Table II.14 – Summary of facility based verification activities by installation category in 2014

	Power reactors	Research reactors	Conversion plants	Fuel fabrication plants	Reprocessing plants	Enrichment plants	Separate storage facilities	Other facilities	MBAs containing LOFs	Total
Number of facilities and MBAs containing LOFs under safeguards	12	3	0	2	0	0	2	0	1	**20**
Number of facilities and LOFs inspected	10	3	0	2	0	0	2	0	1	**18**
Number of inspections	39	3	0	5	0	0	16	0	1	**64**
Number of design information verifications	11	3	0	2	0	0	2	0	1	**19**
Number of person-days of inspection	279	6	0	24	0	0	60	0	2	**371**

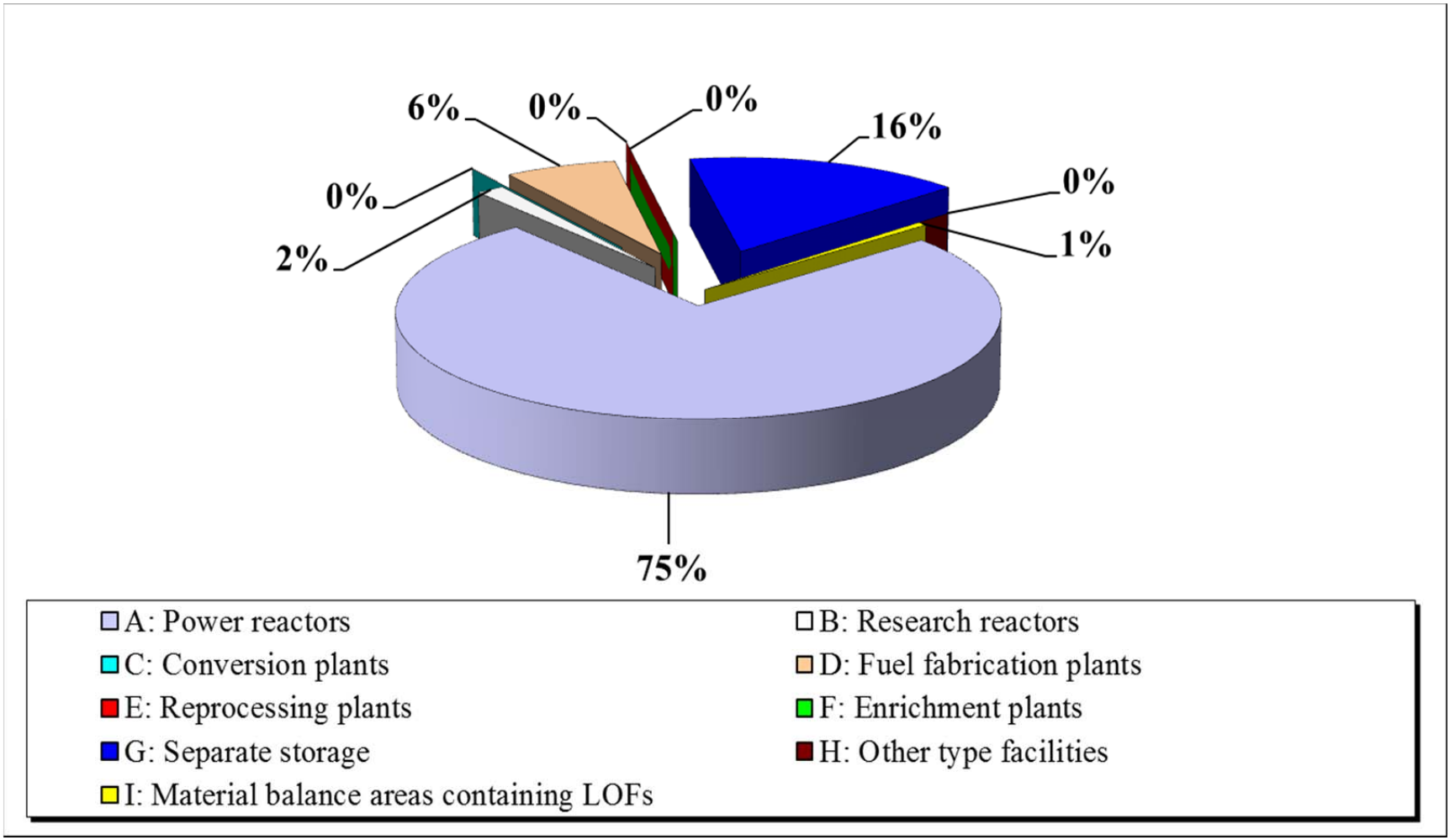

Figure II.5. Distribution of inspection effort (person-days of inspection) by facility category for States with safeguards agreements based on INFCIRC/66/Rev.2.

Table II.15 – Verification activities in 2014

States	Facilities under safeguards	MBAs containing LOFs under safeguards	Number of facilities and LOFs inspected	Total number of inspections	Number of design information verifications	Person-days of inspection	Calendar-days in the field for verification	Number of accounting reports received in 2014	Number of additional protocol declarations received in 2014
India	11	0	11	47	12	259	447	157	1
Israel	1	1	2	2	2	4	8	4	
Pakistan	7	0	5	15	5	108	208.5	39	
Total for 3 States	**19**	**1**	**18**	**64**	**19**	**371**	**663.5**	**200**	**1**

Group 6: States with both voluntary offer agreements and additional protocols in force

Table II.16 – Amount of nuclear material, in significant quantities, under Agency safeguards at the end of 2014

Unirradiated plutonium	Unirradiated high enriched uranium	Unirradiated uranium-233	Irradiated plutonium	Irradiated high enriched uranium	Irradiated uranium-233	Low enriched uranium	Natural uranium	Depleted uranium	Thorium	Total significant quantities
10 343	**0**	**0**	**18 598**	**0**	**0**	**1291**	**816**	**1628**	**0**	**32 676**

Note: Significant quantity figures rounded to the nearest integer.

Table II.17 – Summary of facility based verification activities by installation category in 2014

	Power reactors	Research reactors	Conversion plants	Fuel fabrication plants	Reprocessing plants	Enrichment plants	Separate storage facilities	Other facilities	MBAs containing LOFs	Total
Number of facilities and MBAs containing LOFs under safeguards	1	1	0	1	1	3	4	0	0	**11**
Number of facilities and LOFs inspected	1	1	0	0	1	3	4	0	0	**10**
Number of inspections	6	1	0	0	1	46	24	0	0	**78**
Number of design information verifications	1	1	0	0	1	3	4	0	0	**10**
Number of person-days of inspection	7	1	0	0	8	289	87	0	0	**392**

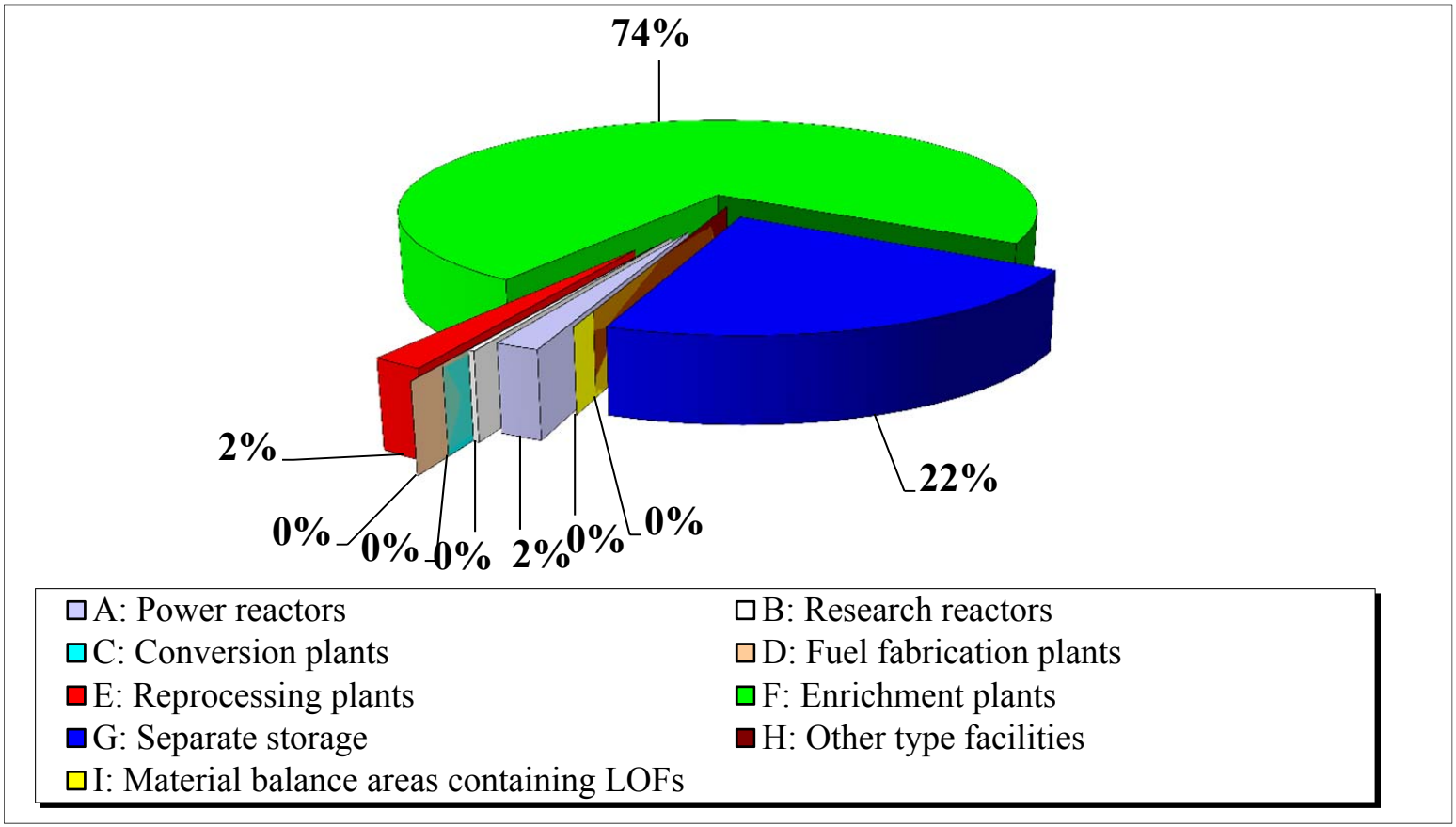

Figure II.6. Distribution of inspection effort (person-days of inspection) by facility category for States with voluntary offer agreements and additional protocols in force

Table II.18 – Verification activities in 2014

States	Number of eligible facilities	Number of facilities or parts thereof selected for inspection	Number of facilities inspected	Total number of inspections	Number of design information verifications	Number of complementary accesses	Person-days of inspection	Calendar-days in the field for verification	Numbers of ICR reporting units received	Numbers of PIL reporting units received	Numbers of MBR reporting units received	Number of additional protocol declarations received in 2014
China	17	3	3	13	3	0	74	205.5	1448	4	4	9
France	17	3	2	19	2	0	111	191.5	79 715	38	38	16
Russian Federation	27	1	1	1	1	0	4	12	10	2	2	10
United Kingdom of Great Britain and Northern Ireland	74	3	3	40	3	0	177	300	566 987	92	93	14
United States of America	289	1	1	5	1	0	26	66.5	27 455	8	5	24
Total for 5 States	**424**	**11**	**10**	**78**	**10**	**0**	**392**	**775.5**	**675 615**	**144**	**142**	**73**