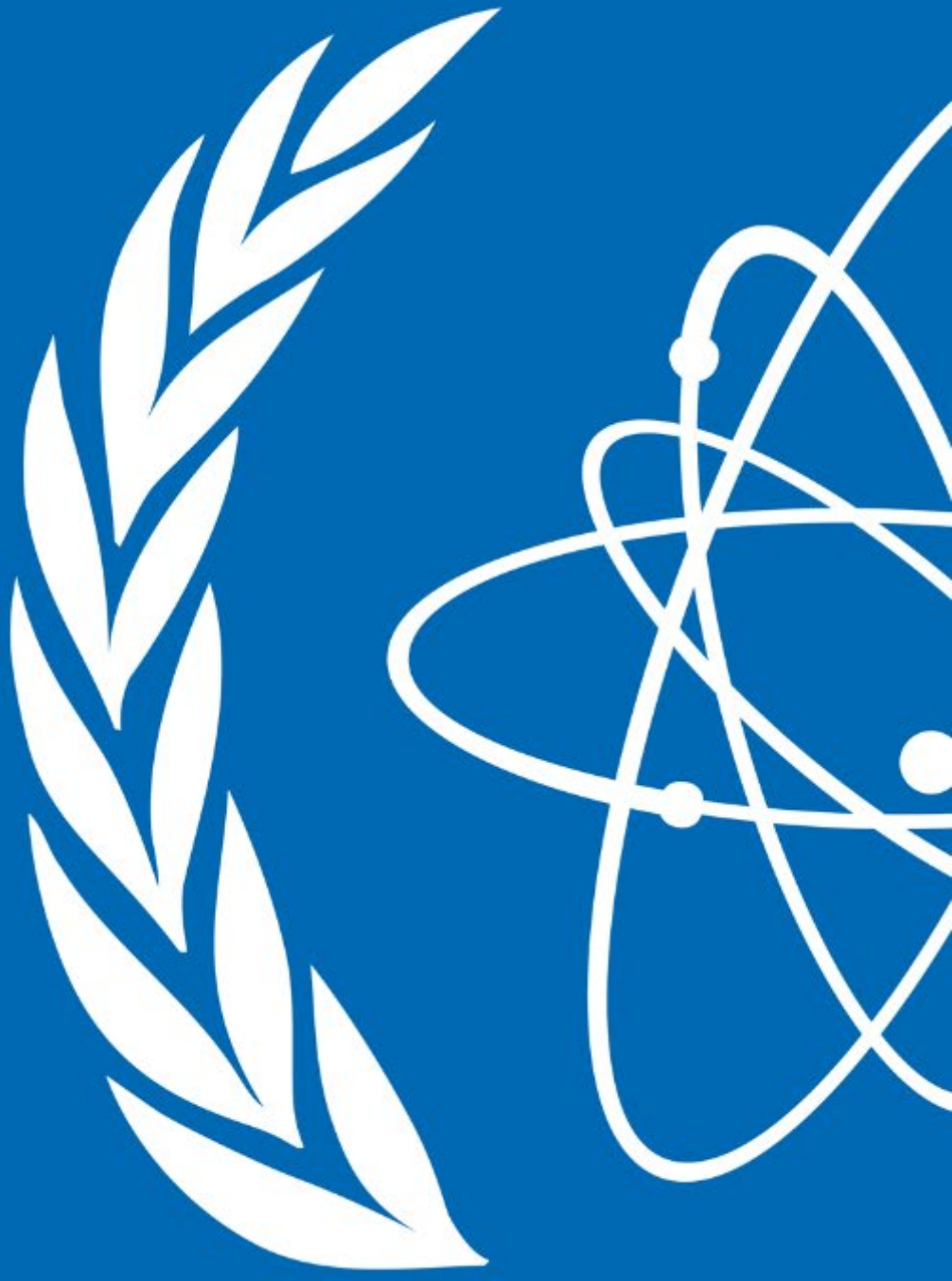
IAEA Safeguards and implementation in EU countries

Marta Ferrari
Section Head, Division of Operations C
Department of Safeguards

3 September 2026



Overview

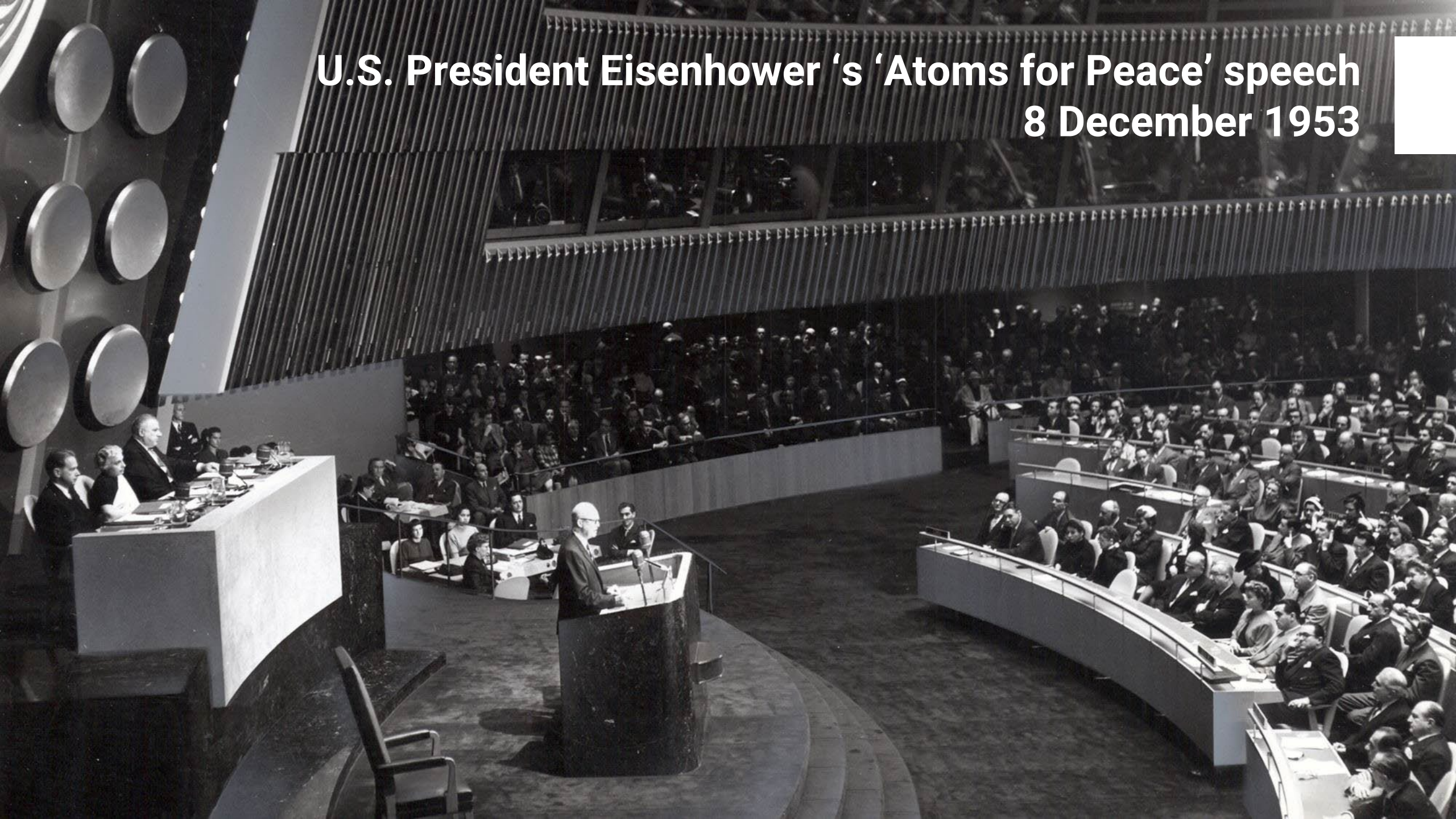
- What are IAEA Safeguards?
- History of safeguards
- Key elements of IAEA safeguards
- How the IAEA implements safeguards
- IAEA Safeguards in EU countries
- Safeguards by Design and SMRs

Safeguards - essential to international peace and security

- IAEA Safeguards are a set of **technical measures** applied on nuclear material and activities to independently verify it.
- The purpose of IAEA safeguards is to **deter the spread of nuclear weapons** by early detection of diversion from peaceful use.
- **Independent IAEA verification** provides assurance to the international community that States are fulfilling their commitments concerning the peaceful use of nuclear energy.

History of safeguards

U.S. President Eisenhower ‘s ‘Atoms for Peace’ speech
8 December 1953



History of safeguards

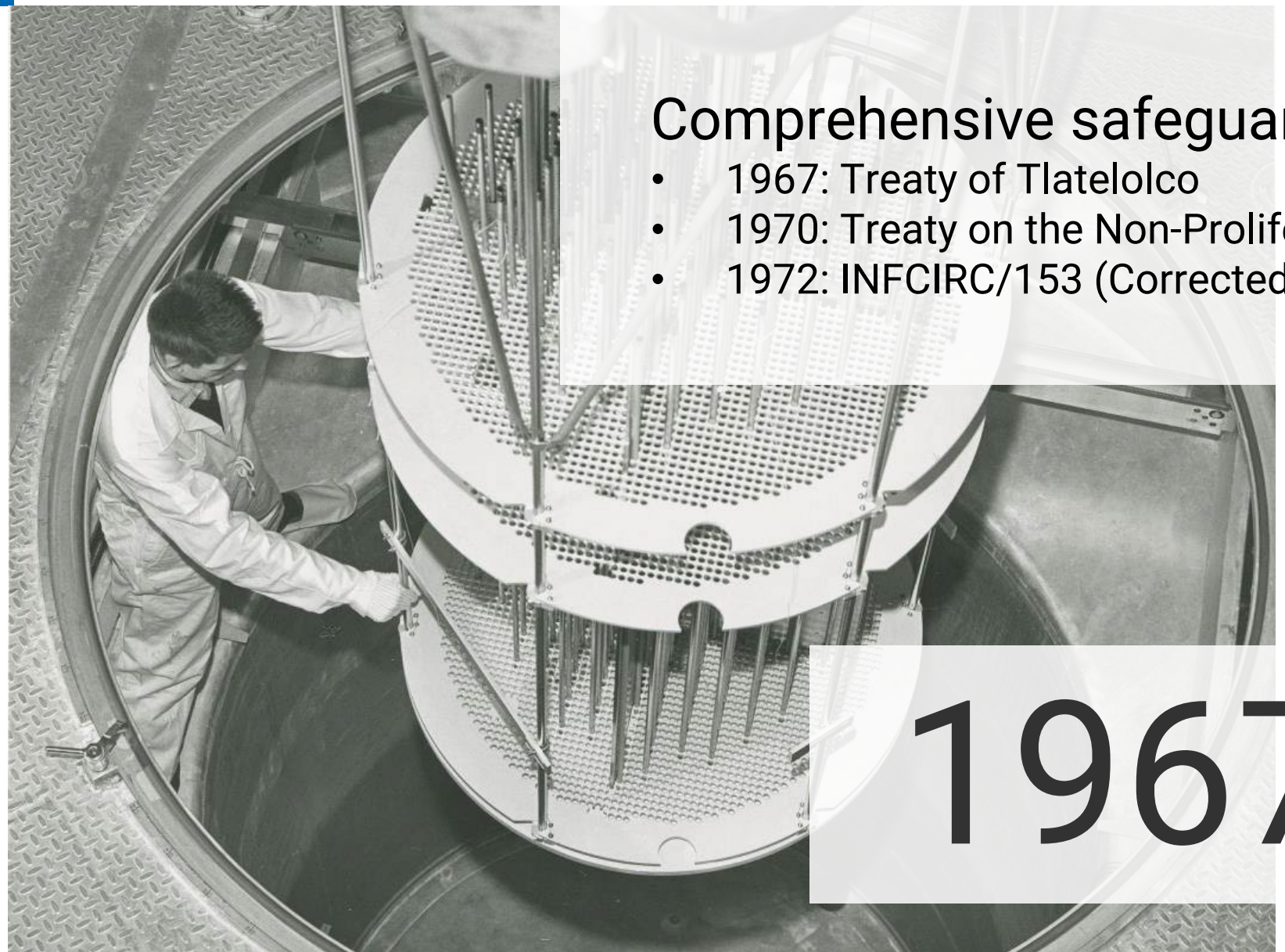
IAEA Statute enters into force

Establishes the IAEA as an autonomous international organization, authorized

“to establish and administer safeguards”

1957

History of safeguards



Comprehensive safeguards agreements:

- 1967: Treaty of Tlatelolco
- 1970: Treaty on the Non-Proliferation of Nuclear Weapons (NPT)
- 1972: INFCIRC/153 (Corrected)

1967-1972

History of safeguards

The IAEA embarks on a programme to strengthen safeguards and improve the Agency's capability to detect undeclared nuclear material and activities

1993-1995

History of safeguards

The Board of Governors approves the Model **Additional Protocol**, providing **broader access to information and locations** for verification

1997

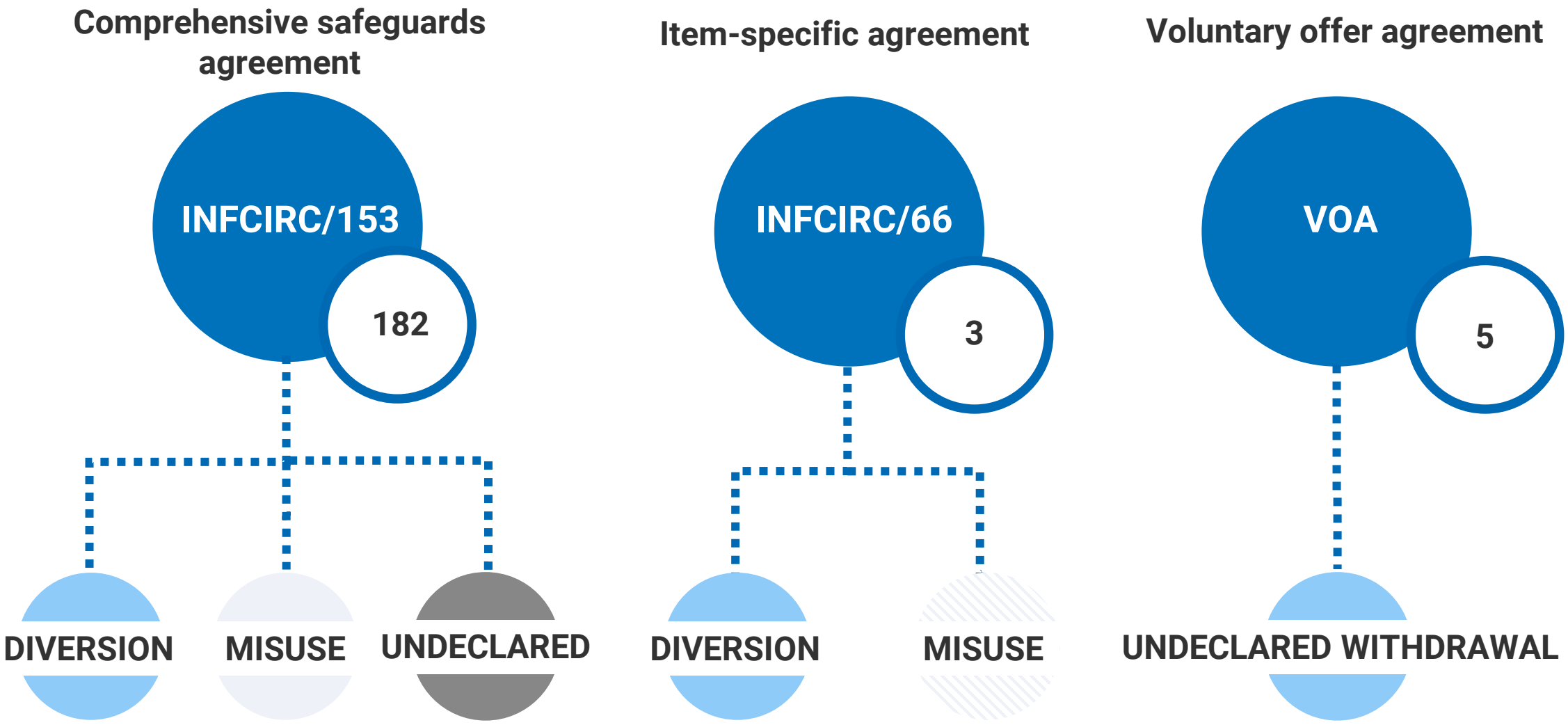
History of safeguards

State-level safeguards implementation: implementing safeguards in a manner that considers a **State's nuclear and nuclear-related activities and capabilities as a whole**, within the scope of the safeguards agreement

1997-today

Key elements of IAEA safeguards

Safeguards agreements: objectives



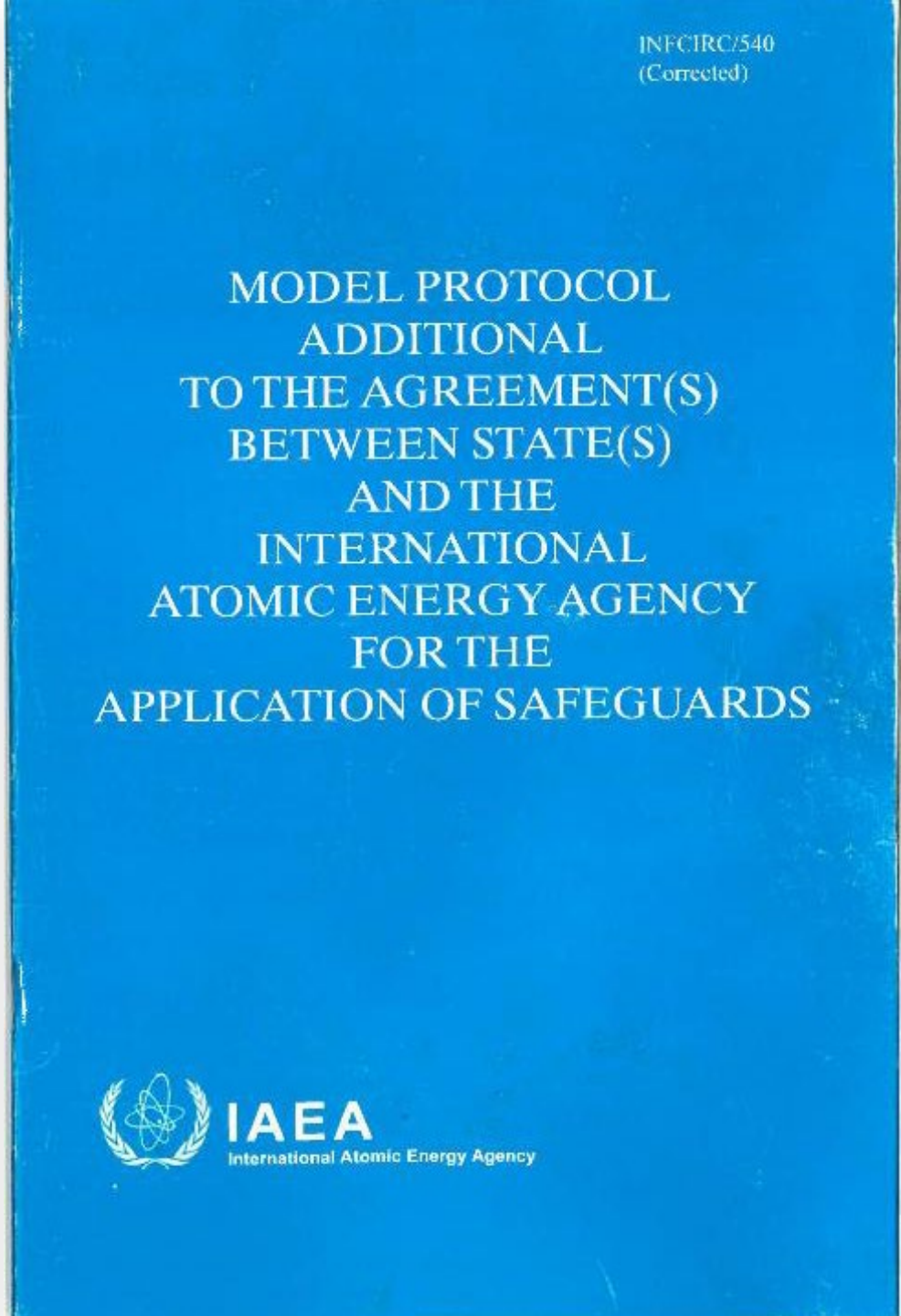
Additional Protocol (AP)

144

Additional verification measures

- Broader access to **information**
- Broader access to **locations**
- Improved **administrative arrangements**

For States with a comprehensive safeguards agreement and an AP, the Agency can provide increased **assurance** regarding the absence of undeclared nuclear material and activities in the State



Nuclear fuel cycle

Manufacturers

Without NM

With NM

Mines

UOC

Conversion

Enrichment

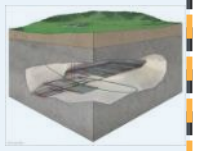
Fuel

Reactors

Wet

Storage

Reprocessing



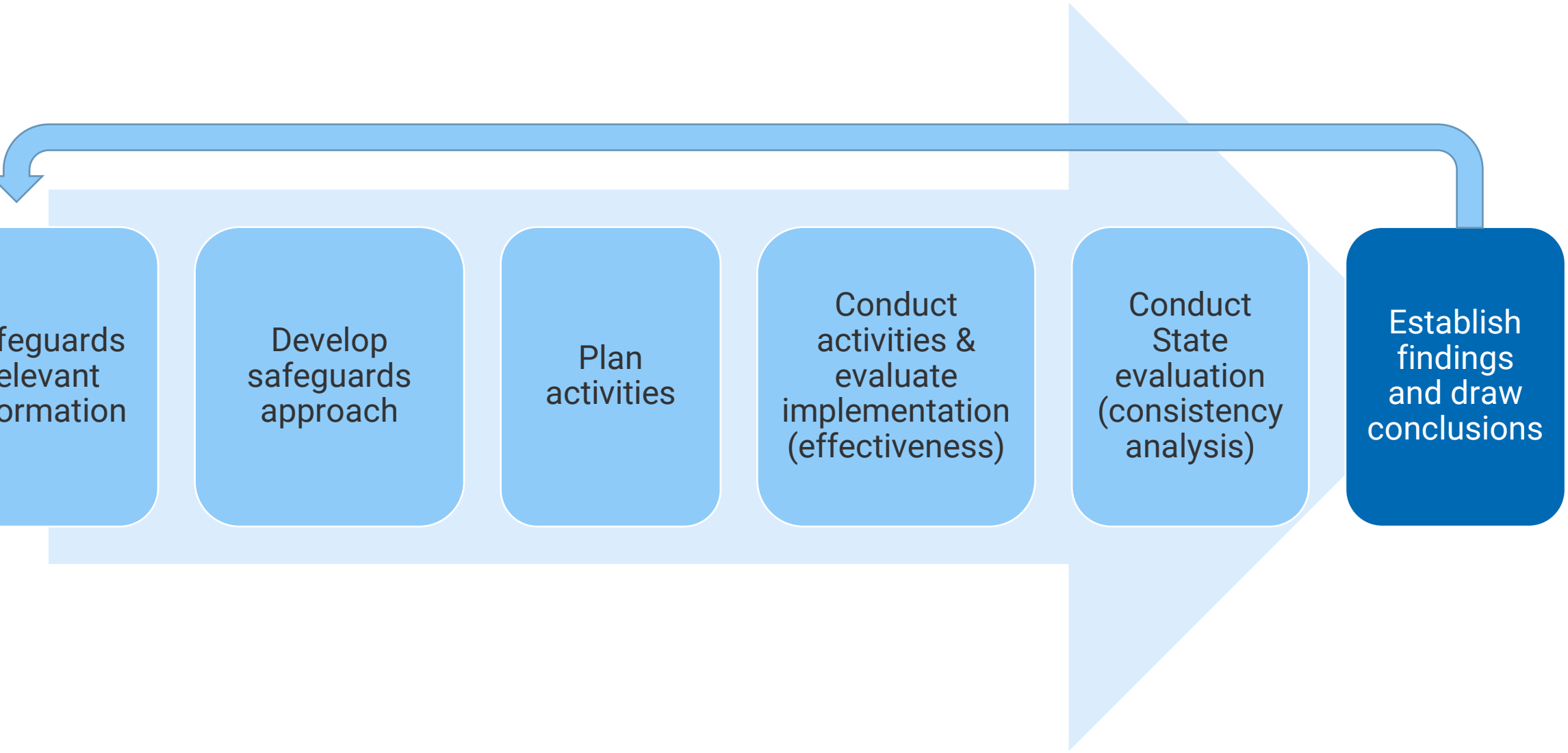
Geological disposal

Comprehensive Safeguards Agreement

Additional Protocol

How the IAEA implements safeguards

Annual safeguards implementation cycle



afeguards relevant nformation | Develop safeguards approach | Plan activities | Conduct activities & evaluate implementation | Conduct State evaluation | Findings and conclusions

State-declared information

Information from Agency verification activities

Other safeguards relevant information

Processing and validation

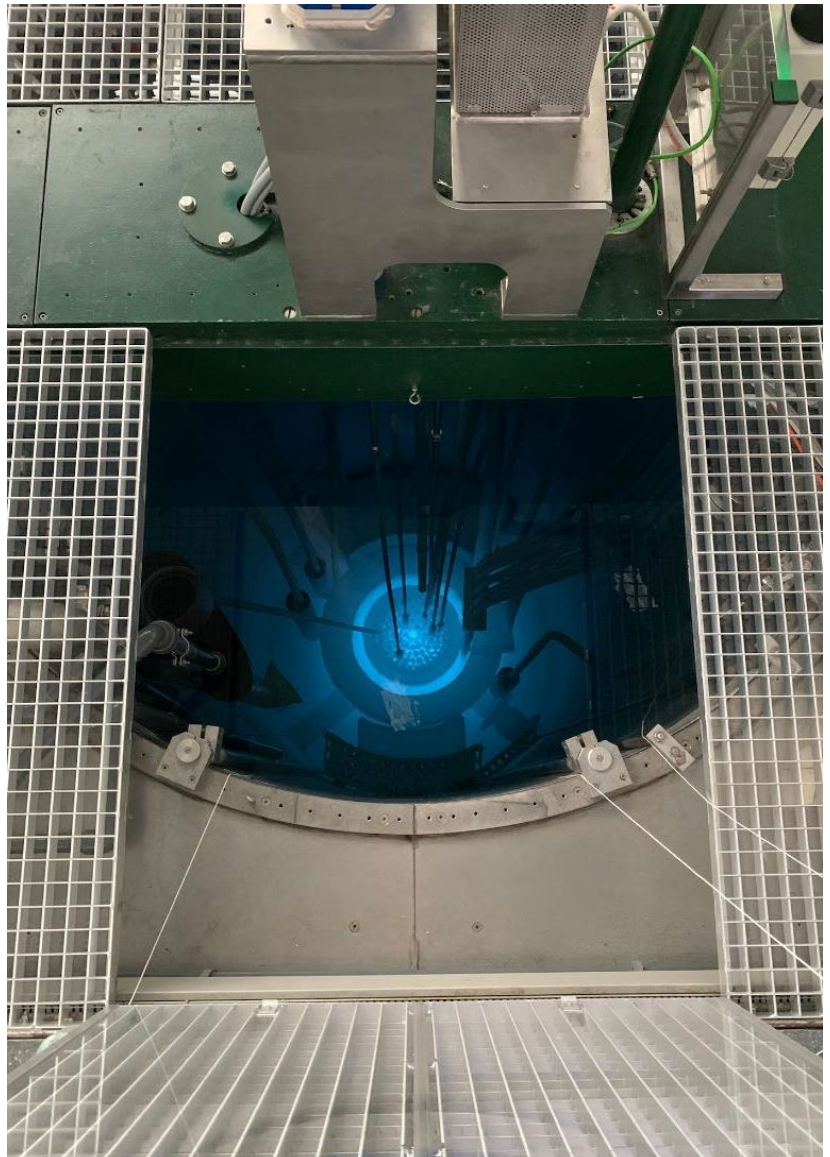
- **Customised approach to implementing safeguards for a State** within the scope of the State's safeguards agreement
- Consists of safeguards' **technical objectives** and applicable **measures** to be implemented in the field and at headquarters

- **Safeguards activities** conducted in the field and at headquarters are planned to address the established technical objectives.
- **Intensity and frequency** of activities are determined by the Agency, in accordance with State-specific factors

Where do inspectors travel to?

nspectors travel across the world to places such as:

- Power reactors
- Storage facilities
- Research reactors and critical assemblies
- Conversion plants
- Enrichment plants
- Fuel fabrication plants
- Reprocessing plants



Equipment for inspections

Equipping inspectors and facilities with the appropriate tools is key to effective safeguards implementation. IAEA inspectors use several types of equipment to verify nuclear material.

Surveillance cameras

Seals

Digital cameras or a laser-based system

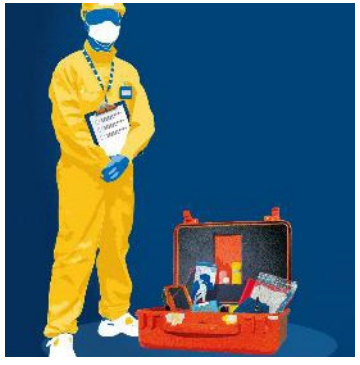
Environmental swipe sample kits

Destructive analysis vials

Portable surface radiation monitors

Next generation Cerenkov viewing device

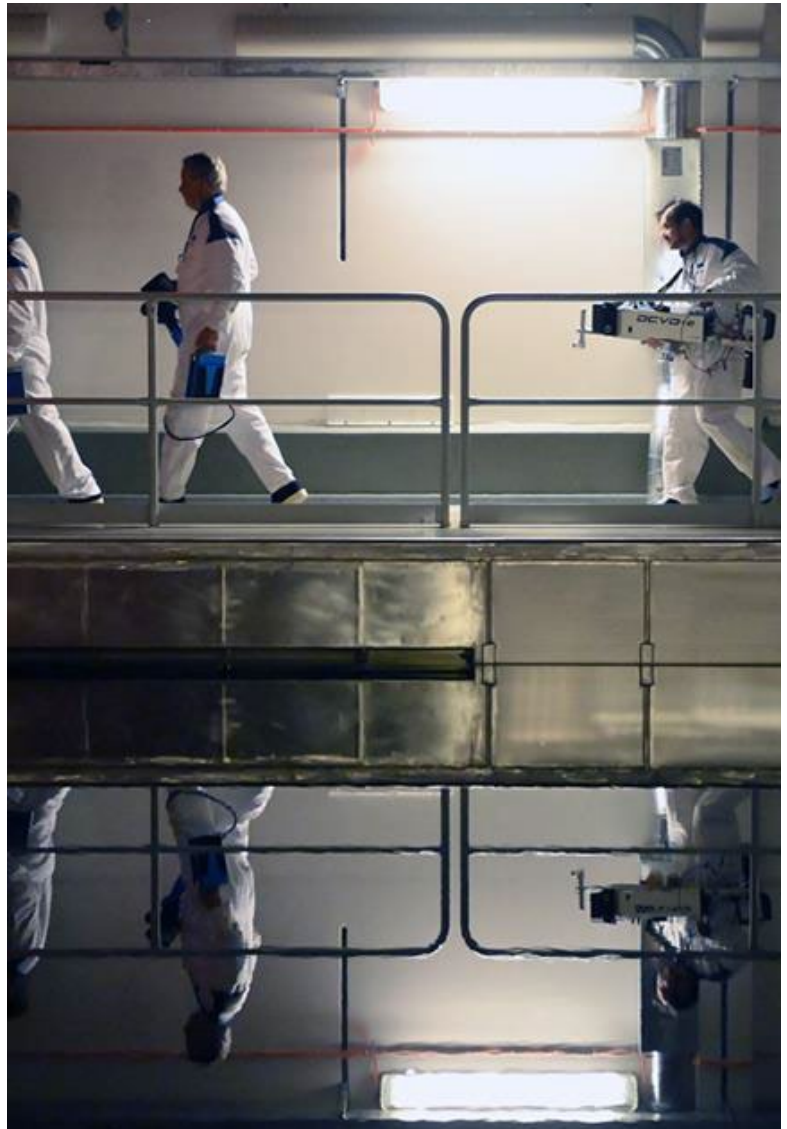
Spectrometric gamma hand-held monitor



Personal protective equipment

afeguards relevant formation | Develop safeguards approach | Plan and conduct all activities | Evaluate implementation | Conduct State evaluation | Findings and conclusions

- All planned activities conducted in relevant timeframe?
- Verification objectives met?



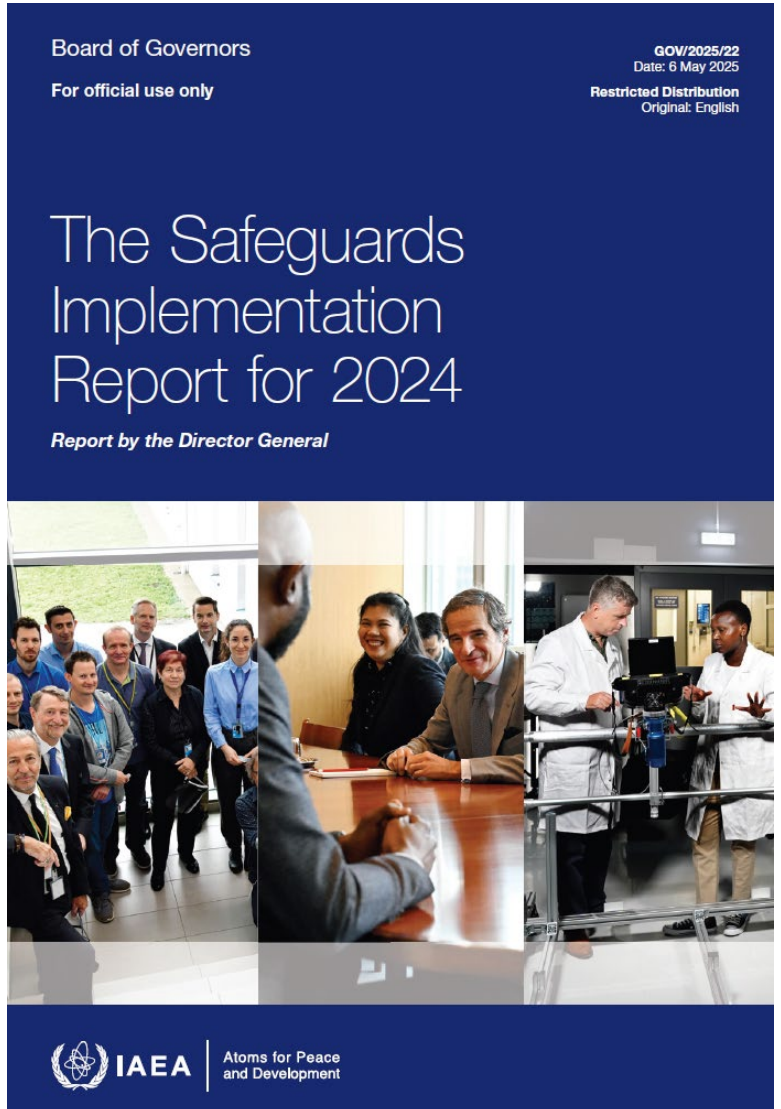
- Consistency of safeguards relevant information
- Identifying follow-up activities
- Clarifying and resolving issues

Satellite imagery analysis

afeguards relevant formation | Develop safeguards approach | Plan activities | Conduct activities & evaluate implementation | Conduct State evaluation | Findings and conclusions

Safeguards findings and conclusions are presented in the annual **Safeguards Implementation Report**

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



2025

safeguards implemented in **190 States** of which **144 States** had additional protocols in force

1,406

nuclear facilities & locations outside facilities under safeguards

Offices

HQ Vienna, laboratories in Seibersdorf, regional offices in Canada & Japan

246,805

significant quantities of nuclear material under safeguards

791

staff from 96 countries

2025

1,141
non-destructive assay systems assembled

169
facilities with remote monitoring systems

933
nuclear material & environmental samples collected

24,800
seals verified

2,899
in-field verifications involving
14,132 days

1,387
Agency surveillance cameras at nuclear facilities

IAEA Safeguards implementation in EU countries

Euratom is a community established under the Euratom Treaty (1958).

Multilateral safeguards agreement INFCIRC/193 between Euratom, the IAEA and 26 non-nuclear weapon Member States (1978)

The IAEA and EURATOM implements Safeguards through a partnership approach that provides for joint inspections with the objective to minimize duplication of activities.

IAEA Safeguards by Design (SBD)

D is the **early consideration** of safeguards
hnical measures in the **design process** of
clear facilities

llaborative risk management between the
ate, the IAEA, and the reactor vendor

st practice, initiated by the technology
der/State

Safeguards by Design: *collaborative risk management*

Desired Outcomes of SBD

- Reduced risk to scope, schedule, budget, and licensing
- Reduced operator burden
- Reduced need for retrofitting
- Facilitation of joint or duplicate use equipment

AEA and technology holder engagement

- Most engagements take place through the framework of Member State Support Programmes (MSSP)
- Current MSSP tasks: Russia, RoK, US, Canada, Finland, France, China, UK, Belgium, Sweden
- Technologies include Floating Nuclear Power Plants, Transportable Nuclear Power Plants, integral PWR, Molten Salt Reactors, Pebble Bed-High Temperature Reactors, microreactors

SBD Challenges and related actions

- In order for SBD to be implemented, vendors and technology holders must have the information and incentive to consider safeguards in their engineering design process
- Existing SBD guidance is only partially applicable to most advanced reactor designs
- The IAEA is developing new model safeguards approaches and new SBD guidance to address advanced reactor designs such as molten salt, pebble bed, and fast breeder reactors

Thank you

www.iaea.org