



# EURATOM approach to Regional System of Accounting for and Control of Nuclear Material (RSAC)

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training meeting

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European Commission  
DG ENERGY– E5  
Cedric DE WALSCHE



**European Commission**  
**Directorate General of Energy**  
**Directorate E – Euratom safeguards**

## **Unit E5 - Nuclear accountancy and international obligations**

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## Outline

# EURATOM approach to Regional System of Accounting for and Control of Nuclear Material

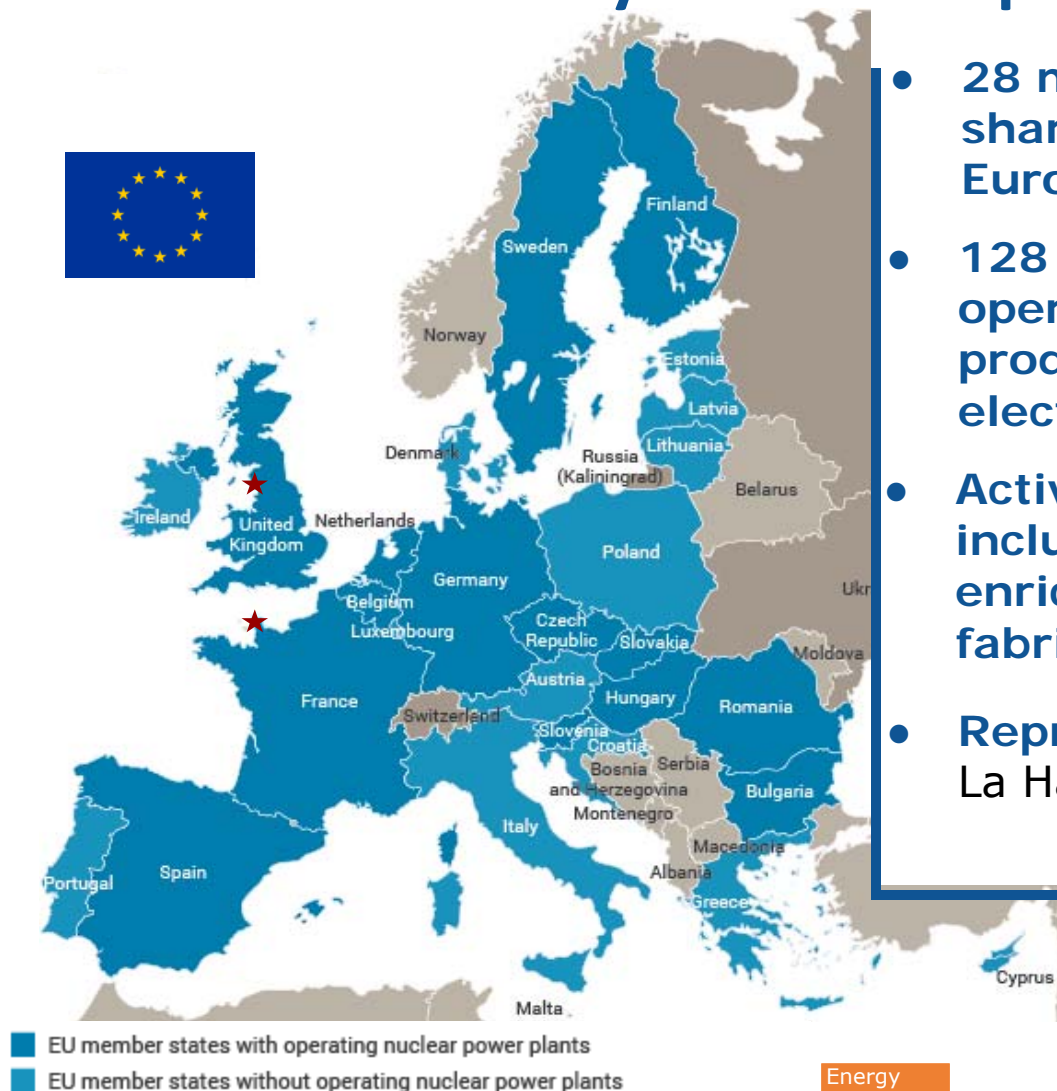
- ***Overview of Euratom safeguards*** : Context, legal framework, Euratom organisation and activities
- ***Safeguards reporting within the EU:***  
*Reporting requirements, data collection and processing*
- ***NMA reporting to the IAEA***
- ***Perspectives and challenges*** (in the field of safeguards reporting)



## Overview of Euratom safeguards



## Nuclear industry in the European Union (EU)



- 28 member states (2 NWS: UK, FR) sharing European institutions and European policies
- 128 nuclear power reactors in operation in 14 states. 857 TWh produced in 2015 (26,5% of EU electricity).
- Activities cover all the fuel cycle, including mining, conversion, enrichment (4 facilities), fuel fabrication (LEU, HEU, MOX) and...
- **Reprocessing:** 2 sites (Sellafield –UK, La Hague –France)

## Institutional framework of EURATOM safeguards

- **Euratom treaty / Chapter 7 (Safeguards)**

- Treaty signed in March 1957.  
Creates a European Atomic Energy Community (Euratom).  
Euratom community includes all member states of the European Union (EU) and shares institutions with the EU.
- Safeguards apply to **uranium, plutonium, thorium**.
- **Art 77** : the **European Commission (EC)** to ascertain that, in the territories of Member States:

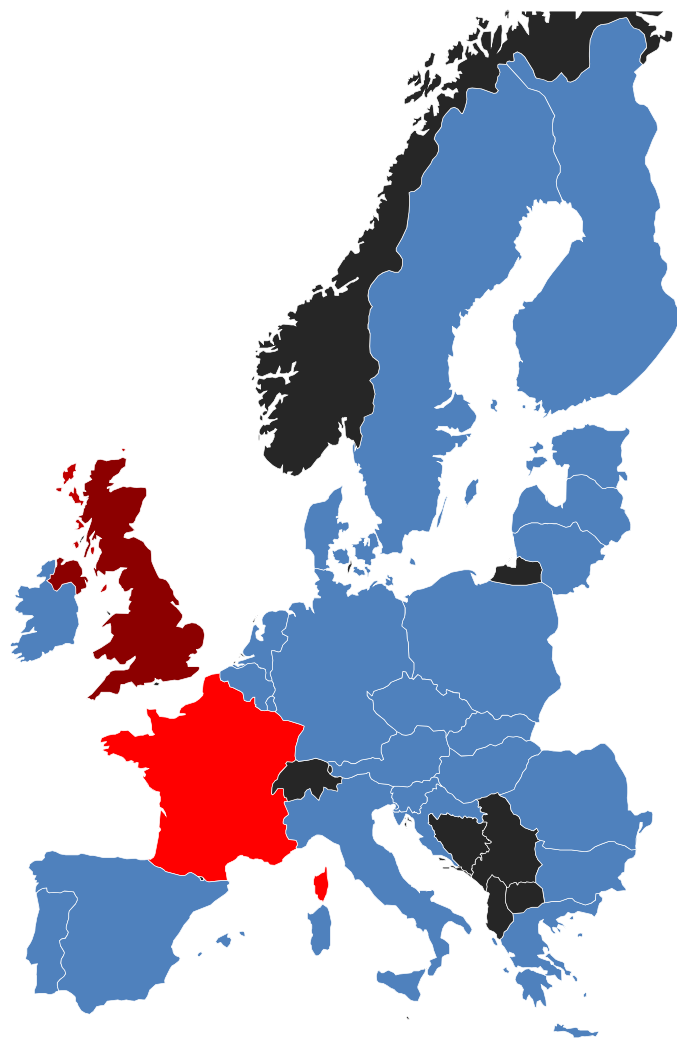


a) **Nuclear materials are not diverted from their declared use**

b) **Safeguarding obligations assumed by the Community under an (international) agreement are complied with**



## Scope of international safeguards in the EU



- Art 77 of the Euratom treaty. Euratom regulation n° 302/2005.
- 3 multilateral safeguards agreements with IAEA



**INFCIRC 193 :**

26 European NNWS, Euratom, IAEA



**INFCIRC 263 :** UK, Euratom, IAEA



**INFCIRC 290:** France, Euratom, IAEA

- **Bilateral agreements in force between Euratom and:** USA, Canada, Australia, Japan, Kazakhstan, Uzbekistan, Ukraine



## Euratom safeguards in practice

- **Safeguards activities assigned to the European Commission based on Chapter 7 of the Euratom treaty are implemented in Euratom Safeguards Directorate of Directorate General for Energy**
  - 21 nuclear accountants (verification of accountancy reports).
  - 130 inspectors involved in physical verifications on site in year 2016. 27 technicians providing support in using safeguards equipment.
  - **Independent safeguards conclusions (yearly for each MBA). Integrated Management System (IMS)**
- **Partnership approach with the IAEA**
  - Coordination, Liaison Committees (HLLC, LLLC), Working Groups
  - 1 person–1 job principle. Tasks, results, training, equipment are shared. > 50 % of inspections were performed with the IAEA in 2016.
- **NMA reporting to IAEA (as per INFCIRC agreements) is ensured by the EC based on reports received from nuclear operators.**



## Euratom inspections (year 2016)

Installation type	Inspection effort (person x days)	Number of on-site inspections	Number of joint EURATOM /IAEA inspections
Reprocessing	1 146	146	19
Enrichment, fuel fabrication	2 039	302	172
Power reactors	545	406	230
Storage, research, ...	875	313	210
<b>TOTAL</b>	<b>4 605</b>	<b>1 167</b>	<b>631</b>



# Organisation of Euratom Safeguards Directorate

- Directorate General for Energy. Director General: Dominique RISTORI
  - Deputy Director General: Gerassimos THOMAS
    - Directorate E. Euratom Safeguards. Director: Stephan LECHNER
      - **E1: Quality assurance and technology**  
Paul MEYLEMANS
      - **E2: Inspections: reprocessing plants**  
Sotiris SYNETOS
      - **E3. Inspections: fuel fabrication and enrichment plants**  
Peter BEUSELING
      - **E4. Inspections: reactors, geological repositories and other installations.**  
Pavel JIRSA
      - **E5. Nuclear accountancy and international obligations**  
Stefano CICCARELLO

## Role and missions of Unit E5

### ***Accountancy:***

- CMF3 database
- Receipt & verification of accounting reports
- Transit Matching
- Generation and transmission of NMA reports to IAEA
- Support to inspection units

### ***Additional protocol:***

- Management of AP declarations and Complementary Accesses

### ***Notification of imports/exports:***

- Receipt and verification
- Transmission to IAEA & Third States

### ***International agreements:***

- Negotiations and establishment of administrative arrangements
- Implementation (balances, flag swaps)

### ***Evaluation***

- Assessment of material balances and MUF (processing facilities)



# Safeguards reporting within the EU

Reporting requirements, data collection and processing



# Regulatory framework of Euratom safeguards

## Regulation Euratom n° 302/2005

- ❑ Directly applies to persons/undertakings holding nuclear material
- ❑ Defines safeguards requirements, especially regarding accountancy and control systems (NMAC) to be implemented by nuclear material holders
- ❑ Defines the requirements in terms of reporting to the European Commission (Basic Technical Characteristics, NMA reports...)
- ❑ Particular Safeguards Provisions (PSP) may introduce additional requirements
- ❑ Supplemented with recommendations:
  - **Euratom 2006/40:** provides guidelines and explanations on technical aspects (e.g. reporting examples)
  - **Euratom 2009/120:** reference characteristics of NMA systems

## Communications to EC as per Reg. EURATOM n° 302/2005

Type	Transmission	Type	Transmission
<b>Design information (BTC)</b>	≥200 days before first receipt ≤30 days after a change	<b>Programme of activities</b>	Annual ≥40 days before PIT
<b>Inventory Change (ICR)</b>	Monthly, XML format By 15th of the following month	<b>Advance notifications</b>	Exp.: ≥8 days before packing Imp.: before receipt, >5 days before unpacking XML format
<b>Physical Inventory Listing (PIL)</b>	≤30 days after PIT, XML format	<b>Conditioned waste</b>	Annual by Jan. 31
<b>Material Balance (MBR)</b>	≤ 30 days after PIT, XML format	<b>Ore shipment / exports</b>	Annual, by Jan 31
<b>Special reports</b>	Unusual occurrences (loss, gain, delayed transfer)	<b>AP Art. 2 a (iii) declarations</b>	Annual by April 1

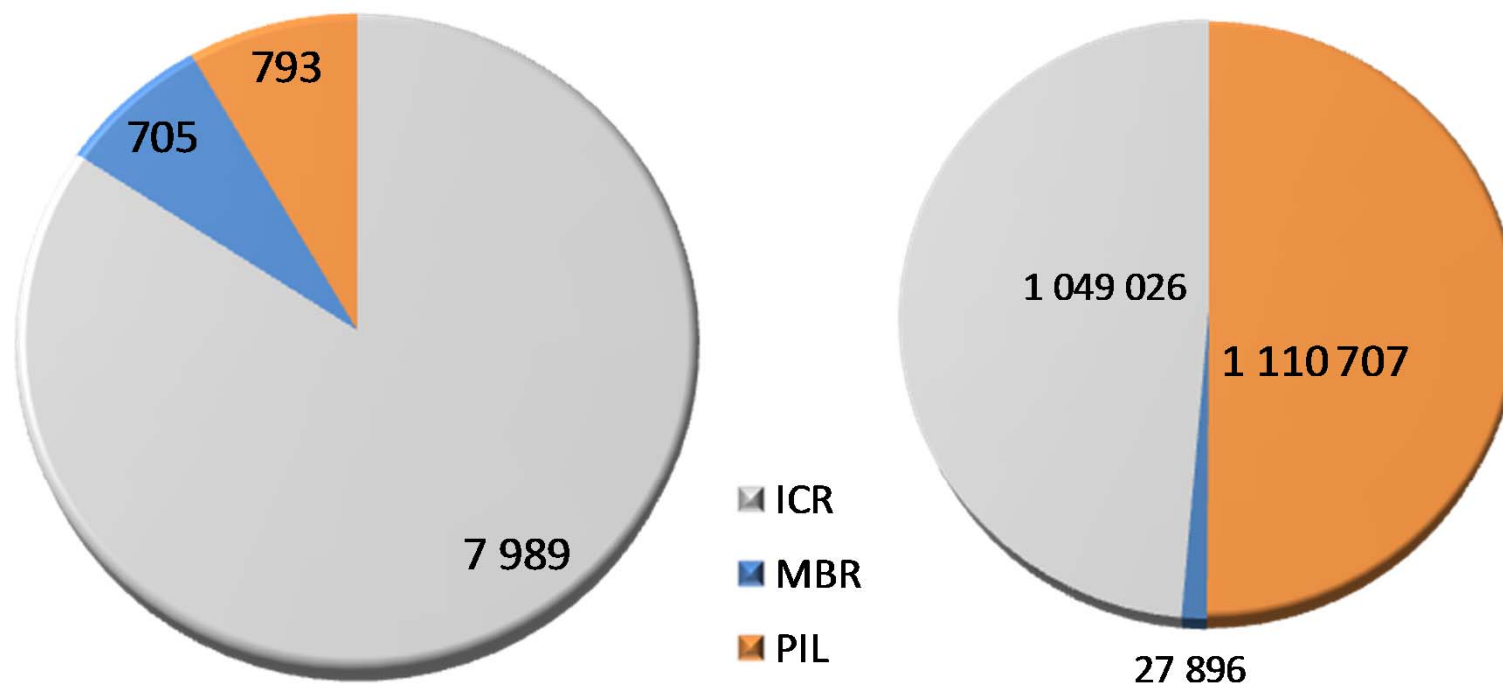
Accounting reports

## Specificities of accounting reports due under Reg. Euratom 302/2005

- Accounting reports are electronic (**XML format**)
- **MAIN DIFFERENCES COMPARED TO CODE 10**
  - 2 categories for enriched uranium (LEU <20%, HEU ≥ 20%)
  - Book stocks at the end of the month are reported monthly in ICR
  - 2 dates are reported in ICR (accounting + physical). Balances are established based on accounting dates.
  - Additional fields: safeguarding obligations, reference to advance notification, burn-up...
  - Specific requirements:
    - E.g., shipper and receiver must report the same batch ID (20 characters)



## Accounting data received and processed by Euratom Safeguards Directorate (year 2016)



- ~9 500 NMA reports

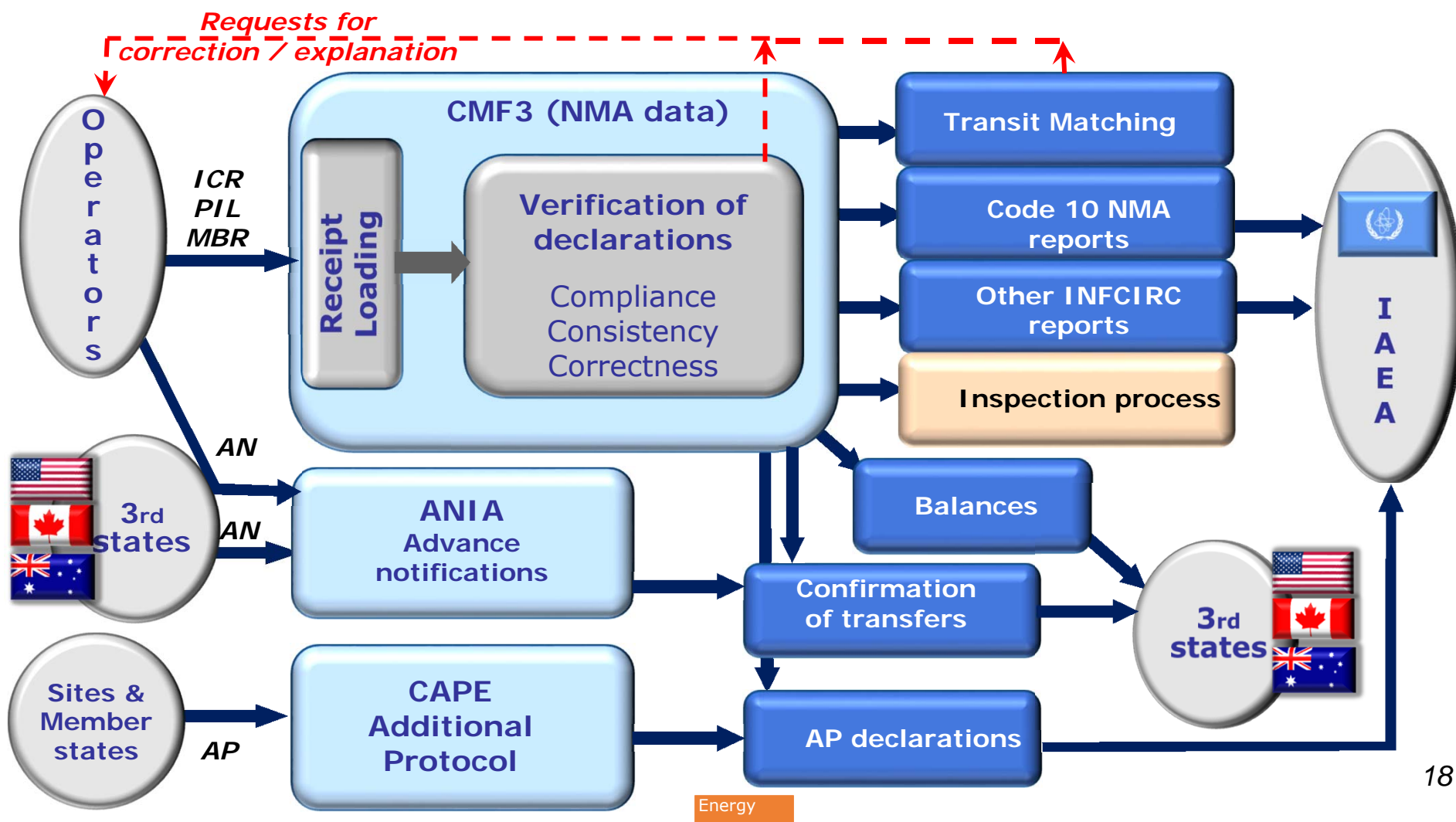
- 2,2 millions records (lines)

## Quality management

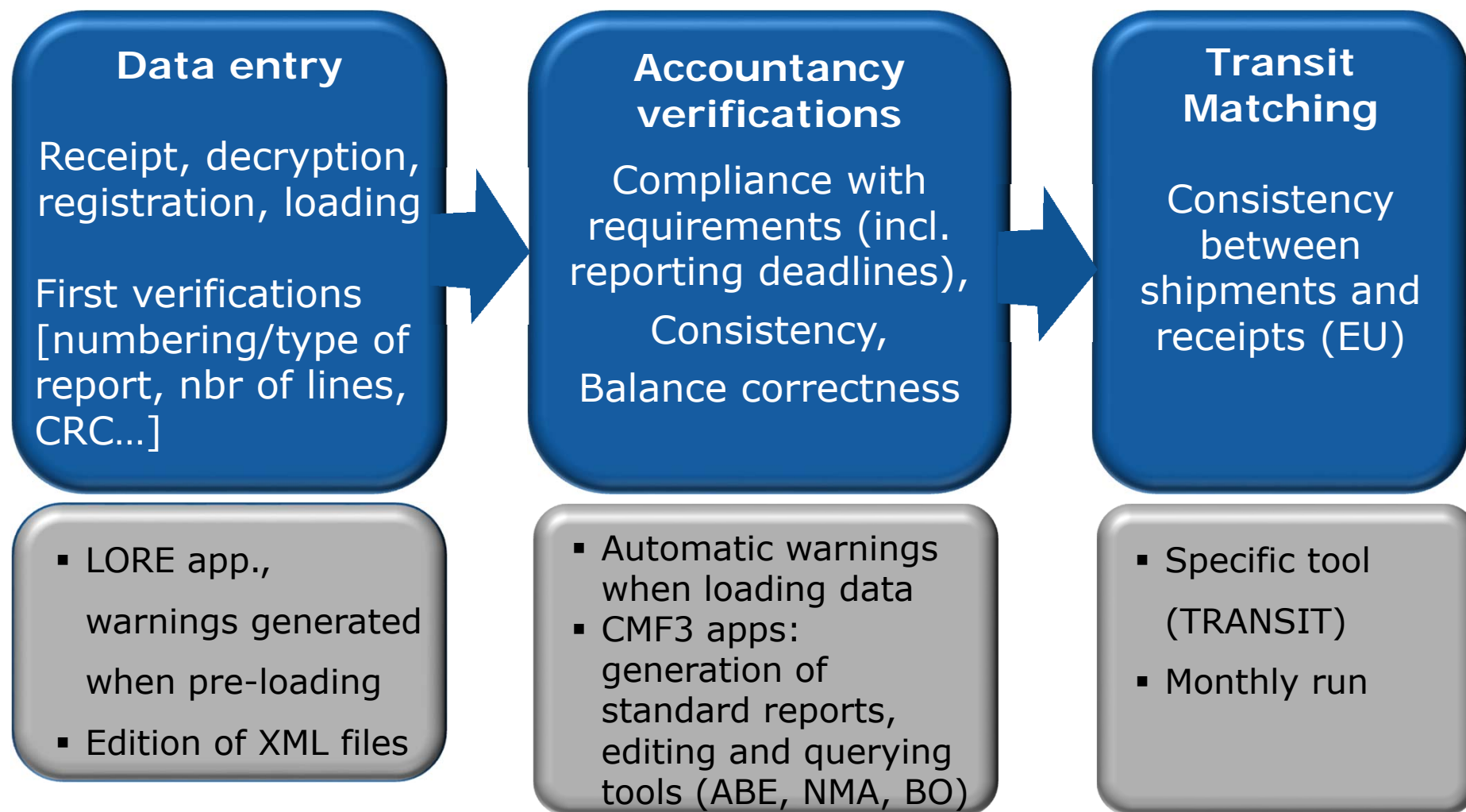
- **IMS** (Integrated Management system). Quality driven approach.
- **High Level Process Map** of DG ENER E defines the process structure used by the Nuclear Safeguards Directorate to establish safeguards conclusions.
- **"Treatment and verification of NMA declarations"** is a business process owned by Unit E5. It contributes to the achievement of several core processes and sub processes defined in the High Level Process Map in interaction with inspection activities.



## CMF3 data handling and processes in DG ENER E5



## NMA data routine verifications





## NMA reporting to IAEA

## Reporting flows (\*)



**EU nuclear  
installations**

*(950 MBA,  
incl. CAM)*



~2,2 M entries/year  
(ICR, PIL, MBR lines)  
Euratom Format  
(Reg. 302/2005)  
>4 400 Adv. Notifications



**DG Energy / E5**



~2,1 M entries/year **IAEA**  
(ICR, PIL, MBR) - Code 10 format  
> 1 300 Adv. Notifications

Balances

Confirmation of  
transfers

Notifications

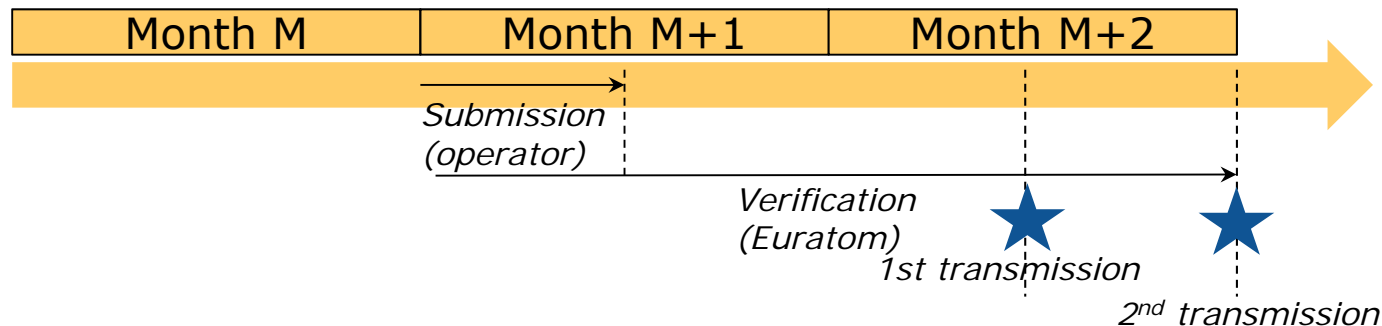
**Third  
states**



(\*) year 2016

# Reporting to IAEA (1)

- 2 transmissions per month according to fixed schedule.
- Selection from NMA reports submitted by EU operators under regulation Euratom 302/2005 and translation into "**labelled code 10**".
- Secure program aimed to run after completion of NMA verifications.



- MBR's are generated based on received ICR's and PIL's



# Reporting to IAEA (2)

- **EURATOM feedback**
  - Comments and requests issued monthly by IAEA after transmission of Euratom reports
  - Issues are followed up by Euratom accountants. When necessary, a request for explanation/correction is sent to operators.
  - Open issues are discussed with IAEA when needed. 2 WGAR meetings /year.



# Euratom perspectives and challenges (safeguards reporting)

# Perspectives and challenges (1)

- **Technical challenges:**
  - Further generalisation of electronic reporting
  - Protection of data and networks
  - Improvement of IT tools to support verification activities
- **Particular Safeguards Provisions (review)**
- **Safeguards policy challenges:**
  - Cybersecurity
  - Waste, decommissioning activities
  - Small holders
  - Geological repositories
  - ...
- **BREXIT**



**Any significant change in safeguards approach or regulation will require approval from EU Council.**

# Perspectives and challenges (2)

## *Interactions with IAEA*



- EC is preparing for:
  - Migration to XML reporting format (instead of labelled text format)
  - Reporting corrections based on "by-difference" principle
  - Reporting additional information (accounting dates)
  - **Expectations:**
    - Consistency gain between EC and IAEA systems with reduction of manual procedures
    - Resolution of a number of inherited reporting issues
- **IAEA approach to waste (termination of safeguards), decommissioning activities**
- **Facility Attachments (review)**



**Thank you !**

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