



The Role of the Nuclear Watchdog: Monitoring Nuclear Safeguards

Diane M. Fischer

Division of Information Management
Department of Safeguards



Treaty on the Non-Proliferation of Nuclear Weapons (NPT)

- Entered into force in 1970
- Indefinitely extended in 1995
- Cornerstone of the nuclear non-proliferation regime
- NNWS are required to conclude a comprehensive ('full scope') safeguards agreement
- Recognized NWS required to negotiate towards nuclear disarmament
- According to Article III of the Treaty, safeguards in NNWS to be applied "on all source or special fissionable material in all peaceful nuclear activities within the territory of such States, under its jurisdiction, or carried out under its control anywhere"
- IAEA inspectors verify compliance with this commitment by various means



IAEA Safeguards

- **Purpose** - To provide assurance about the exclusively peaceful use of nuclear material and facilities
- **Objectives** - Timely detection of diversion and deterrence through risk of early detection
- **Task** - To verify correctness and completeness of declarations made by States



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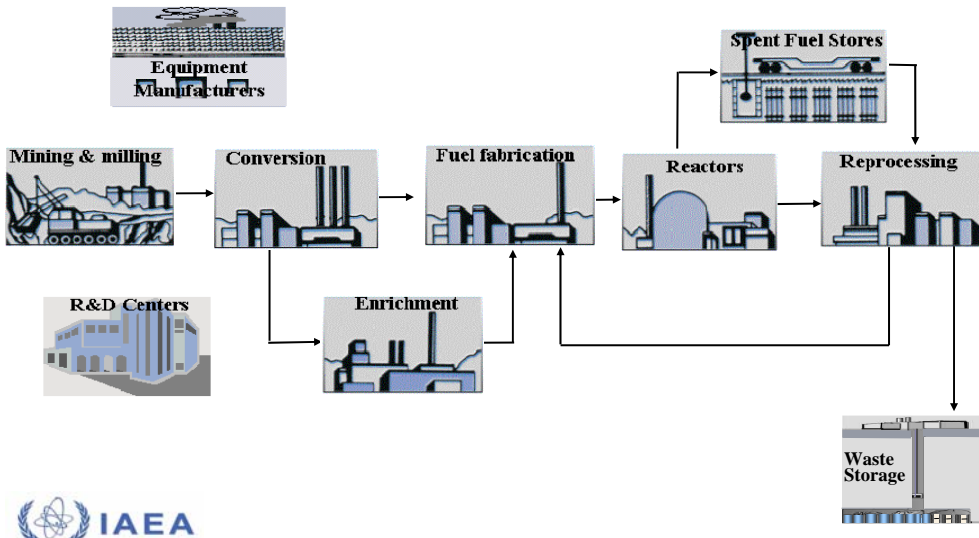
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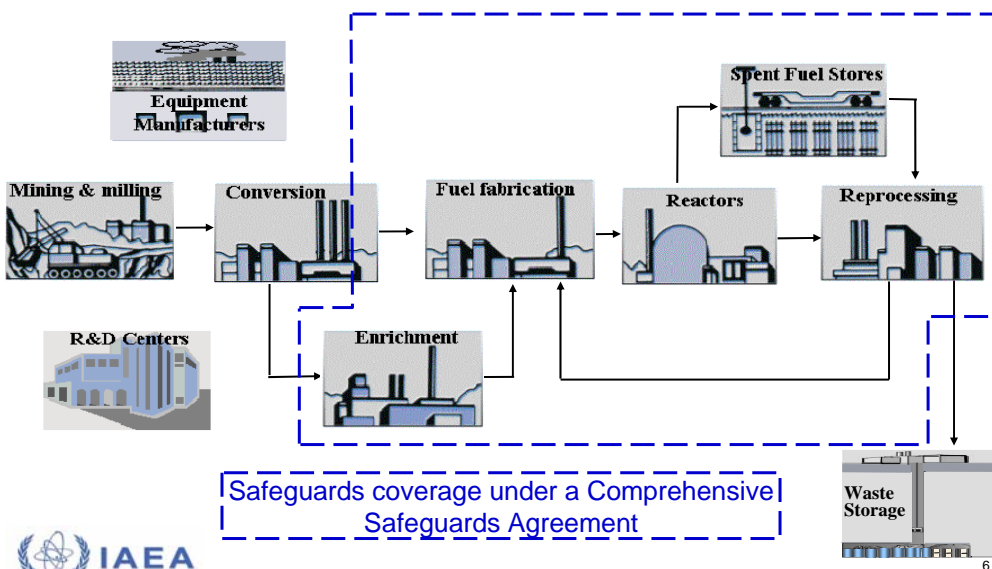


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Nuclear Fuel Cycle

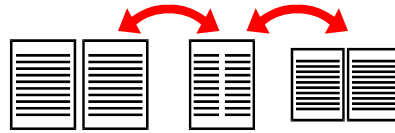


Nuclear Fuel Cycle

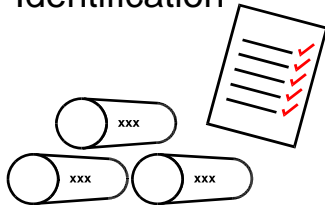


Nuclear Material Accountancy

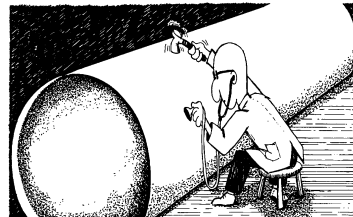
Records Examination



Item Counting and Identification



Measurements



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Nuclear Material Accountancy



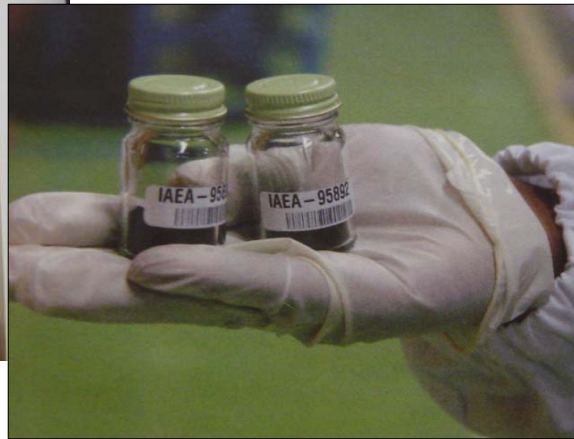
Inspectors counting and identifying fresh fuel at a power reactor



Verification of UF₆ cylinders

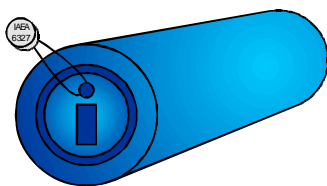
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Nuclear Material Accountancy Nuclear Material Sampling

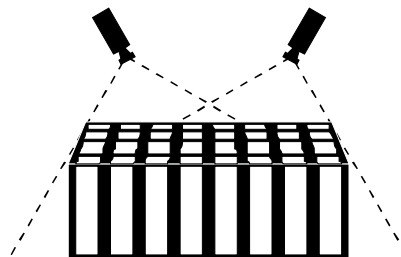


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Containment and Surveillance



Seals



Cameras/Video



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Application of Containment and Surveillance Measures



Containment and Surveillance



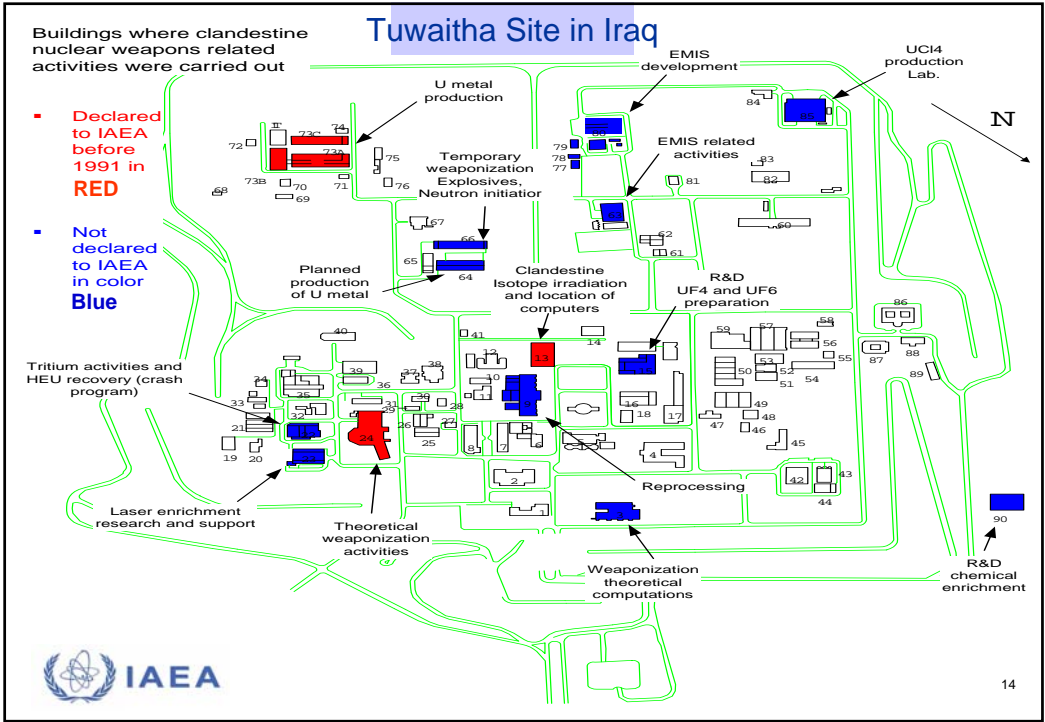
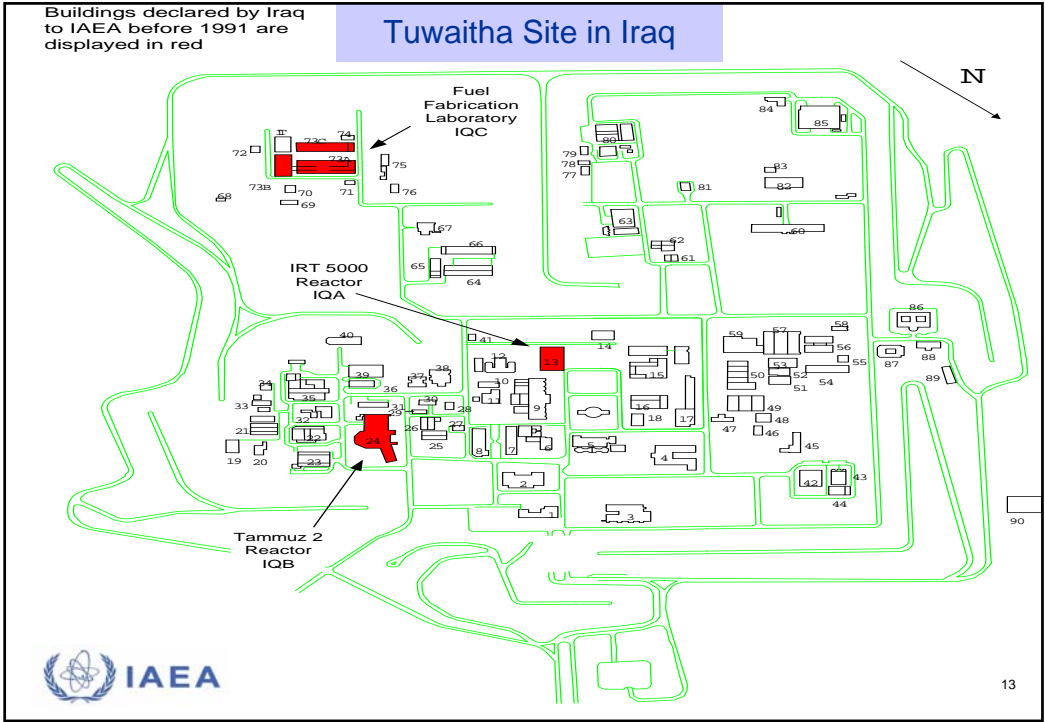
Surveillance cameras being serviced



Sealing of a spent fuel rack



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Strengthened Safeguards - Post Iraq

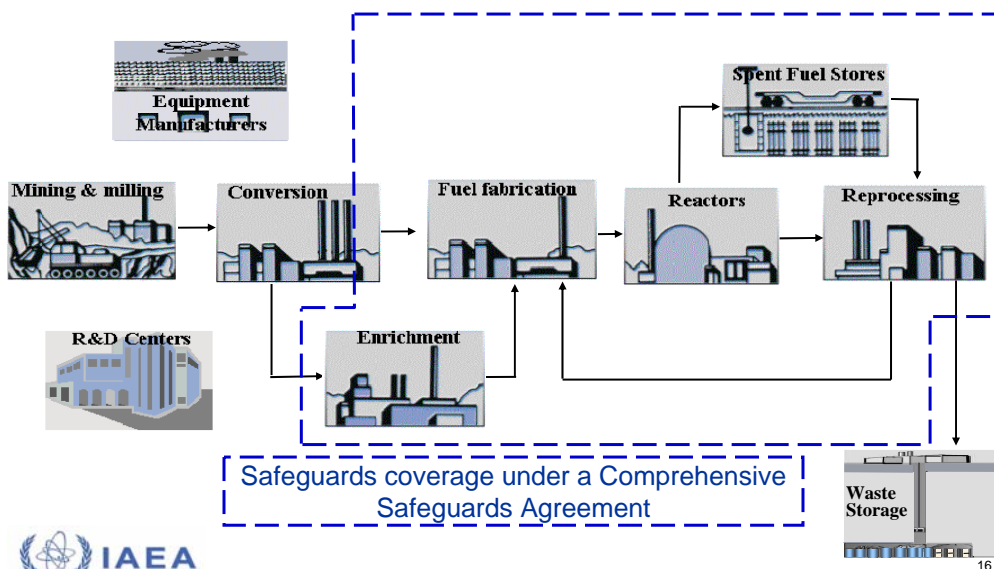
- More information on States' nuclear programmes
- Broader access to relevant locations
- Advanced verification technology

Expanded legal authority provided by an additional protocol to a safeguards agreement

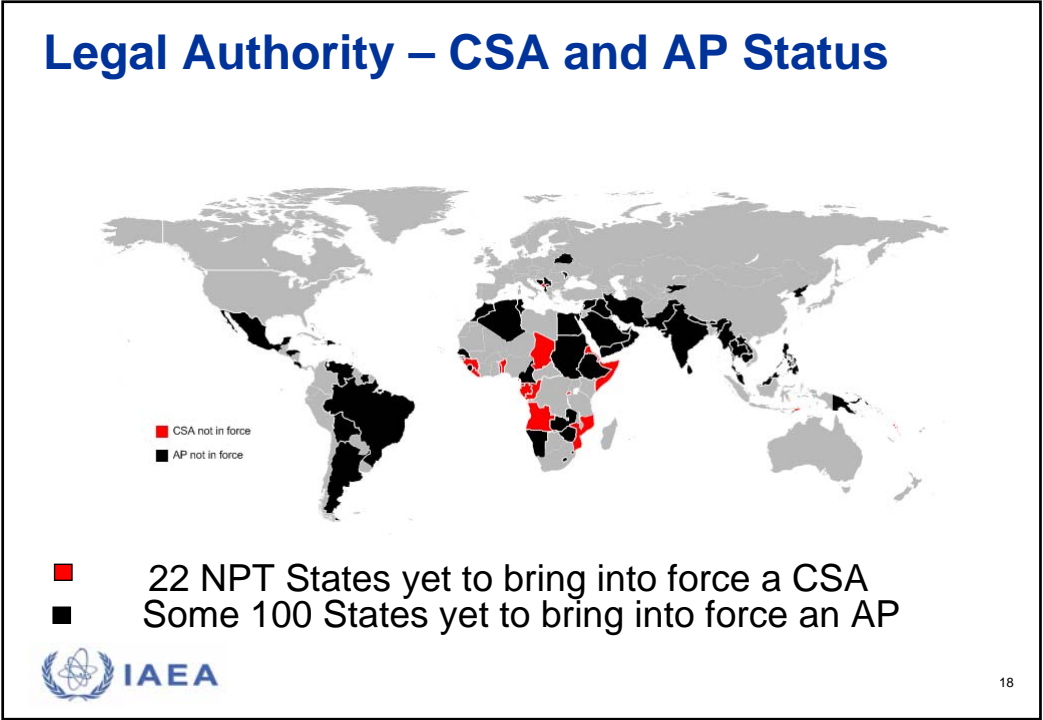
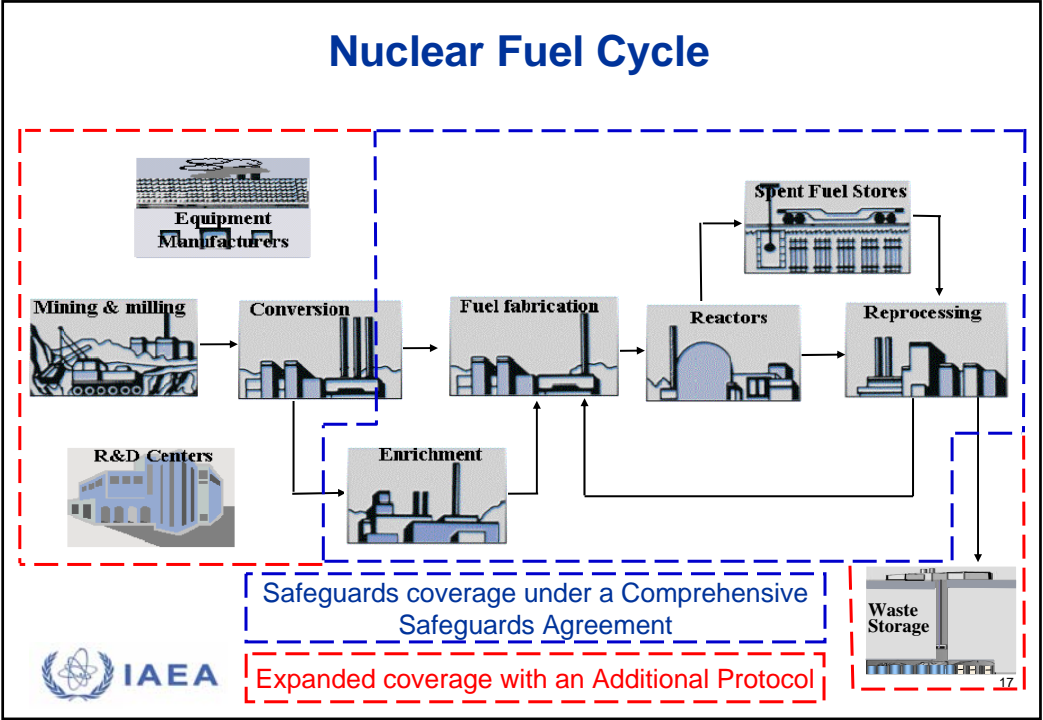


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Nuclear Fuel Cycle



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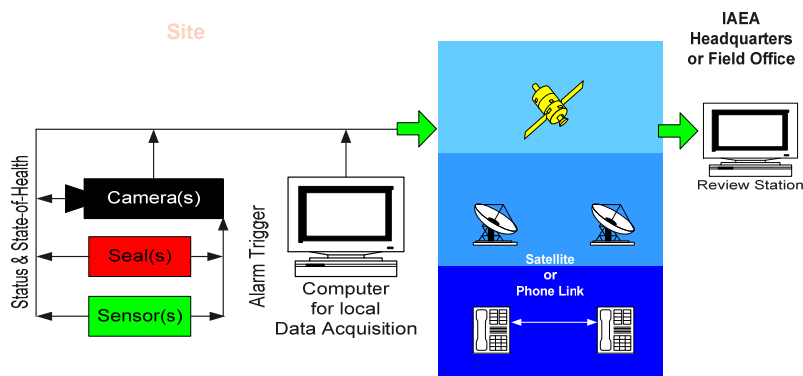
Advanced Technology - Environmental Sampling

Current Status

- Swipe sample collections in more than 70 States (inspections, DIV, CA):
 - 16 enrichment facilities
 - 270+ other installations, mostly with hot cells
- Almost 7000 samples analyzed
- 14 Network Laboratories in 8 Member States



Advanced Technology – Remote Monitoring

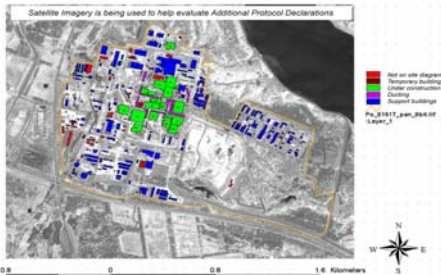


Current Status

- 114 surveillance systems and 80 unattended radiation monitoring systems capable of transmitting all data to HQ



Advanced Technology – Satellite Imagery



Current Status

- In-house satellite imagery laboratory established
- High-resolution commercial imagery acquired using 16 satellites owned by 11 imagery providers in 8 States
- In 2008, over 400 images purchased and analysed

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Advanced Technology Open Sources, Technology and Trade Analysis

Procurement Tracking System - 1.4.0

Organization: Search

Country: France | Type: Fresh | Last Item Date: 2008-12-03

| Commodity | City | Country | Type | Last Item Date |
|-----------|-------|---------|-----------------|----------------|
| W4250000 | Paris | France | High conference | 2008-12-03 |
| W4250000 | Paris | France | High conference | 2008-12-03 |
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Automated Decision Report

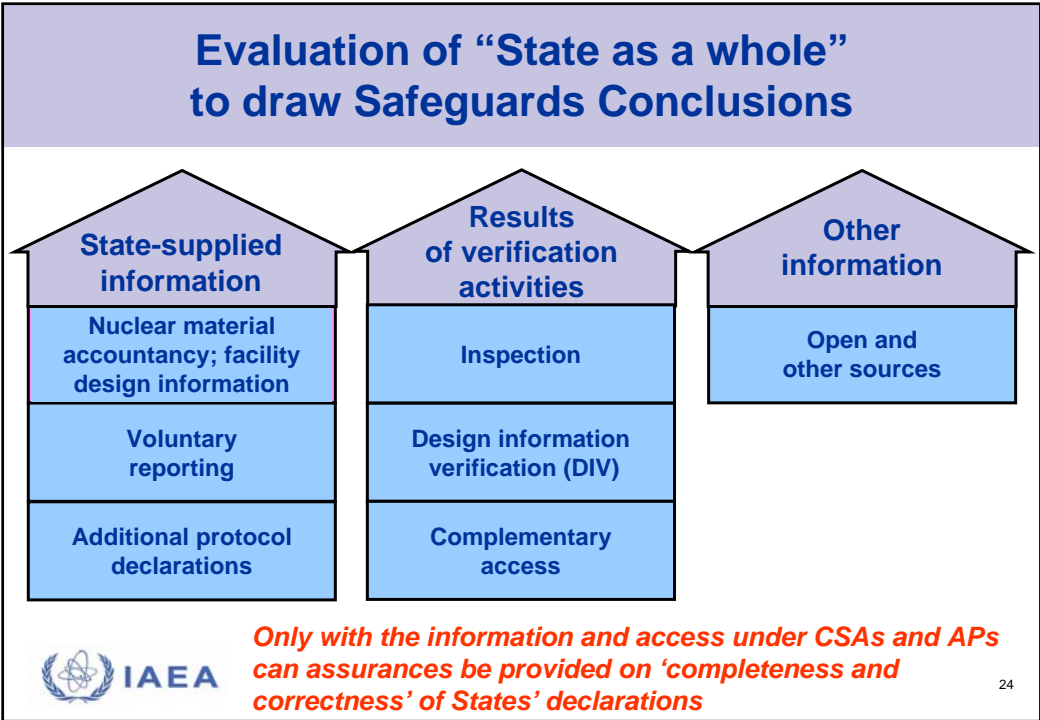
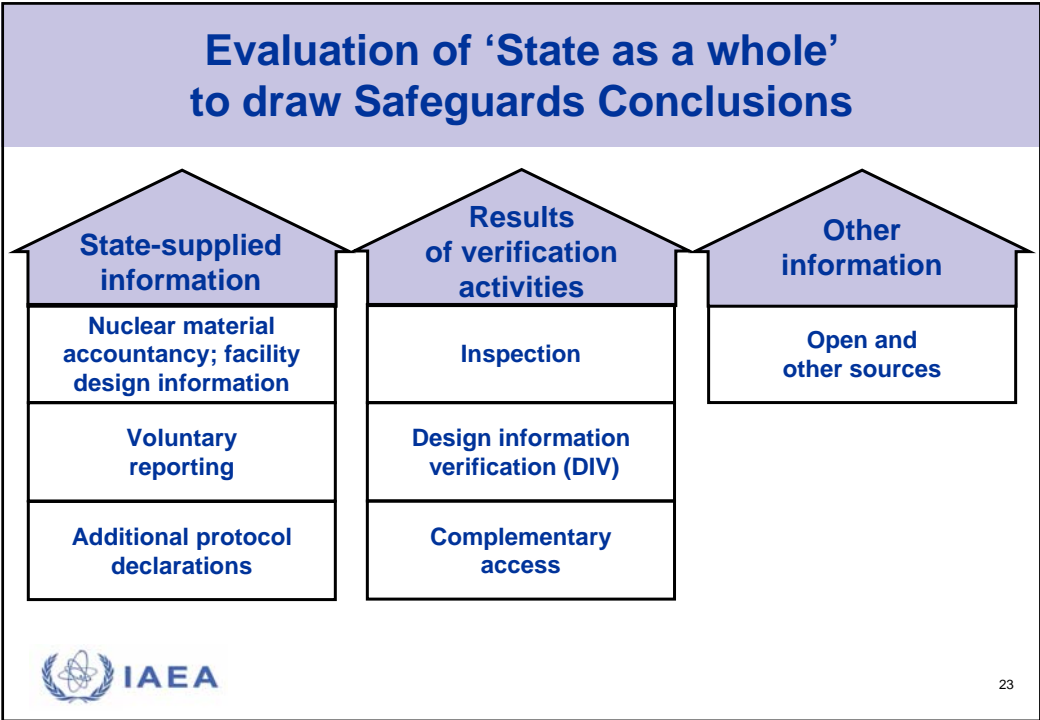
Generated By: [User]

Date: 2008-12-03

| Item | Quantity | Unit | Price |
|------|---------------------|------|--------------------|
| 001 | 100 | kg | 1000.00 |
| 002 | 50 | kg | 500.00 |
| 003 | 25 | kg | 250.00 |
| 004 | 12.5 | kg | 125.00 |
| 005 | 6.25 | kg | 62.50 |
| 006 | 3.125 | kg | 31.25 |
| 007 | 1.5625 | kg | 15.625 |
| 008 | 0.78125 | kg | 7.8125 |
| 009 | 0.390625 | kg | 3.90625 |
| 010 | 0.1953125 | kg | 1.953125 |
| 011 | 0.09765625 | kg | 0.9765625 |
| 012 | 0.048828125 | kg | 0.48828125 |
| 013 | 0.0244140625 | kg | 0.244140625 |
| 014 | 0.01220703125 | kg | 0.1220703125 |
| 015 | 0.006103515625 | kg | 0.06103515625 |
| 016 | 0.0030517578125 | kg | 0.030517578125 |
| 017 | 0.00152587890625 | kg | 0.0152587890625 |
| 018 | 0.000762939453125 | kg | 0.00762939453125 |
| 019 | 0.0003814697265625 | kg | 0.003814697265625 |
| 020 | 0.00019073486328125 | kg | 0.0019073486328125 |



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State Level Approach to Safeguards

- Use of all information about a State's nuclear programme to plan, implement and evaluate safeguards activities in a State ("information driven").
- A comprehensive State evaluation, conducted to provide as complete a picture as possible of a State's nuclear programme, used as basis for drawing safeguards conclusions.
- For a State with a comprehensive safeguards agreement (CSA) and an additional protocol (AP) in force, the objective is to draw the broader safeguards conclusion.
- With a broader conclusion, it is possible to optimize safeguards implementation under CSAs and APs – *Integrated Safeguards*.



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Safeguards Conclusions

For States with safeguards agreements:

- ... the nuclear material and other items placed under safeguards remained in peaceful activities ...

For States with a comprehensive safeguards agreement and an additional protocol:

- ... **all** nuclear material remained in peaceful activities ...



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Status of Safeguards Agreements and Additional Protocols (1 Jan 2010)

| | Total | APs signed | APs in force | Broader SG con- clusion | Inte- grated SG |
|------------------------------------|------------|---------------|-----------------|-------------------------------|-----------------------|
| NNWSs with CSAs | 162 | 113 | 89 | 51 (2008) | 47* |
| NWSs with VOAs | 5 | 5 | 5 | - | - |
| INFCIRC/66 States | 3 | 1 | 0 | - | - |
| NPT States without CSAs | 22 | 9 | - | - | - |



*and Taiwan, China

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Some Implementation Statistics for 2008

- Facilities under safeguards 1131
- Nuclear material under safeguards 152 000 SQs
(90 t Pu; 930 t Pu in spent fuel; 30 t HEU; 56,000 t LEU)
- Number of Inspections 2 040
- Number of complementary accesses 120
- Metal seals (detached and verified) 20 000
- Other seals (verified in situ) 9 000
- Nuclear material samples 500
- Environmental samples 370
- High-resolution satellite images 320



Regular Budget: €114 M; Extrabudgetary: €21M

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