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“Contribution of IRSN to the international RP assistance

Expertise in case of orphan or unsafe sources”

Content

- Emergency intervention for the recovery of an orphan source
- Expertise of an outdated irradiator

Expertise of an orphan source in the Republic of Benin

- 8 January 2008 : detection alert at the harbour of Colombo (Sri Lanka) in a container coming from Cotonou (Benin)
- 18 April : Republic of Benin contacted IAEA for help to conduct a radiological investigation
- 23 April : IAEA requested assistance of the French Nuclear Safety Authority
- 25-26 April : Intervention of two experts (D. Ladsous/N. Brisson-IRSN)



Am 241 detected
23 $\mu\text{Sv/h}$ (neutron dose rate) contact
Localized point





Contamination and irradiation check



An electronic dosimeter for each worker



Unloading of the metal scrap



Localization with gamma and neutron counter



Source



Packaging



Interim storage

Spectrometry gamma in situ + visual inspection + neutron
an gamma measurement + modelization + source
documentation from the IAEA database



Am²⁴¹-Be Activity = about 4 GBq

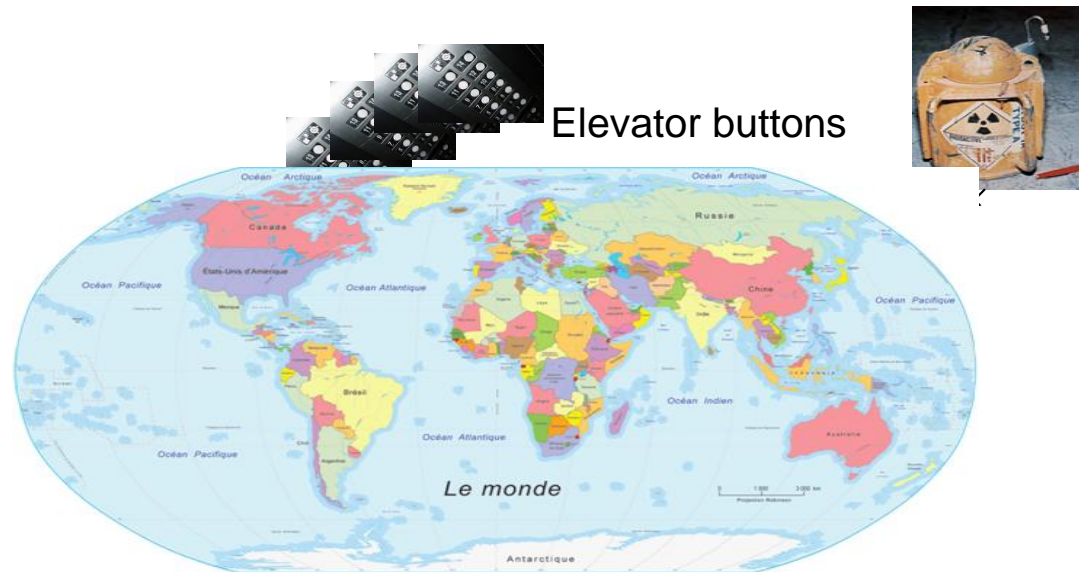
Neutron moisture gauge to schedule irrigation

Provider identified

Possible risks

- Potential exposure due to the dismantling of a device and handling radioactive source by people unaware of the risks
- Potential exposure due to accidental recycling of the source into any stainless steel product

In 2008, in France, the discovery of stainless metal products contaminated with Co 60 distributed by Indian providers ...



Expert recommendations :

Install a detection system in the harbour and train staff

Assistance in an African country

- A research centre using an irradiator to sterilize male tsetse flies in the fight against the African animal trypanosomiasis disease

Extension tube

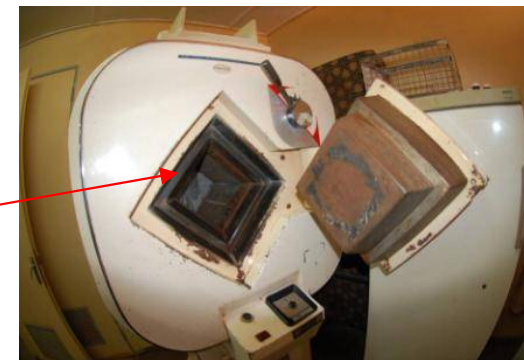
4x114 TBq of Cs 137

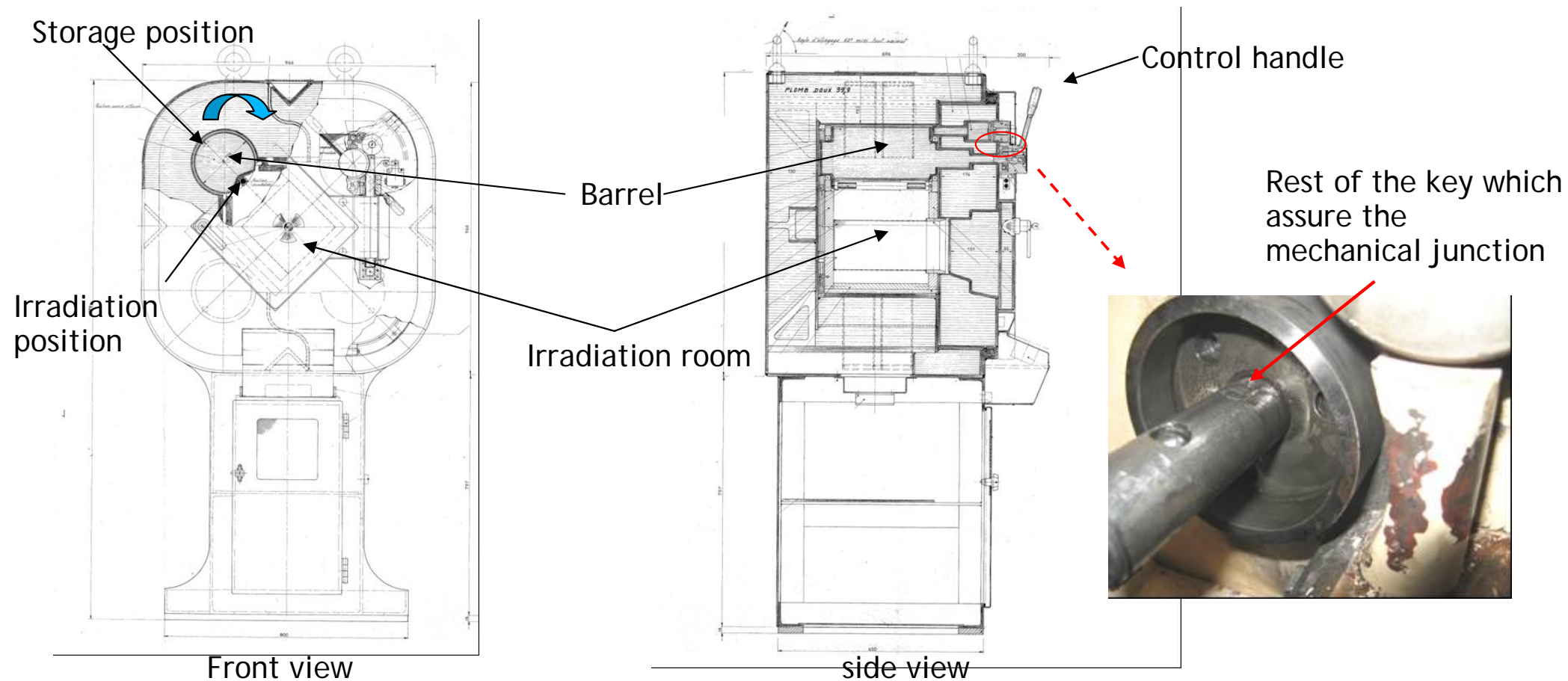
Installed in 1973



- February 2009 : door completely blocked :
 - extension of the handle to unblock the safety control system
 - door unlocked, but abnormal dose rate
 - the local authority requested for IAEA's help
- June 2009 : Missions of the IAEA Experts (S. Israël-IRSN/L. Hordijk-NECSA) :
 - evaluation of the possible radiological risks suffered by workers
 - safety recommendations

Abnormal dose rate : 1,3 mSv/h





- possibility to open the door with the sources still in irradiation position
- position of the sources untraceable from the outside



high risk of exposure

Main cause assumptions

- design failure of the safety control lock
- age of the system with absence of regular maintenance and cleaning
- Rust
- Lack of external inspection

Irradiator restored in temporary safe operating condition

Expert recommendations :

Replacement of the irradiator... ASAP



Contribution to the RP assistance for developing countries

- Training programs to limit emergency situations
- IRSN experts involved in IAEA regional courses in the field of :
 - radioactive waste
 - mines
 - radioactive sources
 - orphan sources



- IRSN recent training sessions :
 - implementation of strategies and national policies on an efficient management of radioactive waste (Ouagadougou March 2009)
 - training course for regulators on authorization and inspection of radiation sources (Rabat October 2009)