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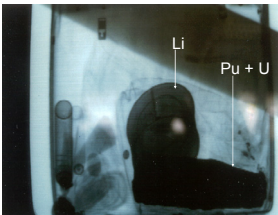
Examples of Nuclear Forensic Investigations Performed at ITU

Since 1992 more than 30 samples of nuclear materials of unknown origin have been analysed at the ITU. The aim of the analyses is to find out the intended use of the material (nuclear power, weapons, scrap), the origin and the last legal owner.

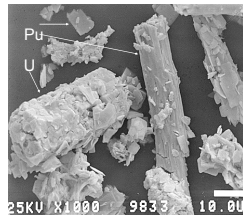
Munich airport 1994

Illicit trafficking of

363 g plutonium + 121 g uranium and 201 g lithium



X-ray photo of the suitcase.



Electron microscope picture of the U/Pu powder.

- weapons usable Pu (87,6 % ²³⁹Pu)
- low enriched U (1,6 % ²³⁵U)
- Pu + Li = possible military application

⇒ origin Russia

Karlsruhe 2001

Theft of

a few mg of radioactive waste



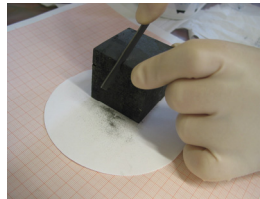
WAK reprocessing plant. Vacuum cleaner bag from the thief's apartment.

- main elements Pu, U, Am, Cs
- contamination in apartment consistent with stolen items

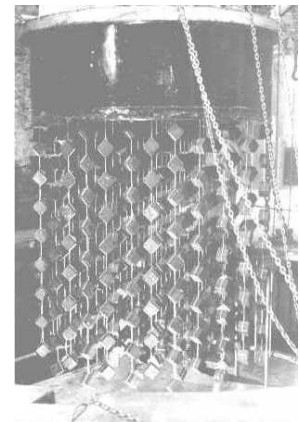
⇒ origin WAK

“Uranium machine” 2002

Authentication of a uranium cube



Uranium pellet.



“Uranium machine”.

- metallic natural uranium
- age 60 years (i.e. production took place in the last quarter of 1943)

⇒ authentic cube from the “uranium machine”

Lauenförde 2007

Source attribution of

14 uranium pellets

- Height 10,95 – 11,35 mm
- Diameter 9,21 – 9,25 mm
- Mass 7,5 – 7,8 g
- U content 88 %
- ²³⁵U enrichment 3,46 %
- Production date Nov. 1990



Uranium pellet.

⇒PWR reactor (Philippsburg-2)

Fuel manufacturer: Siemens Hanau, Germany

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