

# Radiation protection measures during the investigation of Po-210 traces in Hamburg in December 2006.

E.Kröger (BfS), 12<sup>th</sup> European ALARA Network Workshop



# Deployment 08-22.12.2006



**28<sup>th</sup> Oct 2006:** Kovtun flew with Areoflot from Moscow to Hamburg and was picked up from the airport with a BMW. He sat on the passenger-seat. He spent the night at a flat belonging to his ex-wife in the Erzbergerstraße.

**29<sup>th</sup> Oct 2006:** Kovtun stayed over in Haselau in the parish of Pinneberg.

**30<sup>th</sup> Oct 2006:** Kovtun had an appointment at the Immigration Office in Hamburg-Altona and signed some papers. He stayed over at a friend's flat in the Kieler Straße in Altona.

**31<sup>st</sup> Oct 2006:** Kovtun travelled around Hamburg and then stayed over in the Erzbergerstraße.

**1<sup>st</sup> Nov 2006:** Kovtun travelled by taxi to Hamburg Airport and flew with Germanwings to London.

# Questions and Problems

- o Is Po-210 present at the sites visited by Kovtun?
- o If so, how much?
- o What measures have to be taken?
- The ZUB was called on by the City of Hamburg to carry out the deployment

# Tasks of the BfS from 08 - 22.12.2006

- I. Measurements at different scenes in Hamburg, Schleswig-Holstein and Cologne (detective work; clues) **Erzberger Straße, Kieler Straße, Haselau, airport, shops, restaurants**
- II. Laboratory analysis in Munich **Air filter samples, Every-day objects**
- III. Laboratory analysis in Munich / Berlin / Rossendorf **Urine samples**
- IV. Evaluation of the measurement results
- V. Advice for the public and deployed forces

# Confirming that Po-210 was present



Testing the  $\alpha$  detector before driving to the site

# Measuring for air contamination



Air filter samples were taken  
on the 9th December:

*In the stairway of Erzberger Str*

*150 m<sup>3</sup> and 50 m<sup>3</sup>*

*In the ex-wife's house*

*150 m<sup>3</sup> and 50 m<sup>3</sup>*





The air filter samples with a sampled air volume of 150 m<sup>3</sup> were flown to the BfS laboratory in Munich.

The measurements were ready on the 10th December and showed no elevated  $\alpha$ -activity in the air in the buildings.

# Measuring for $\alpha$ -contamination



German legal limit Po-210

1 Bq / cm<sup>2</sup>

Efficiency

10 %

Detector area

100 cm<sup>2</sup>

⇒ **10 counts/second**



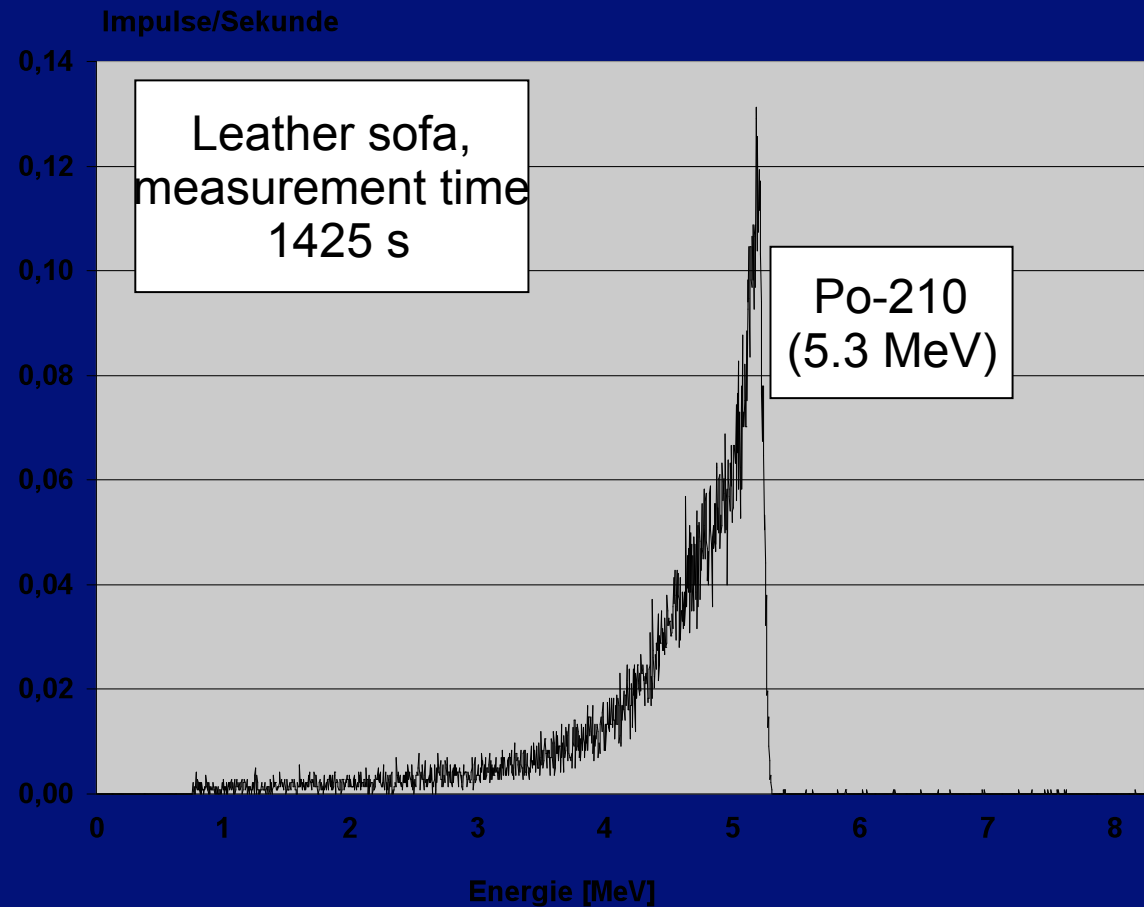
# Fabric samples

Seat of the leather sofa  
10.0 – 15.0 counts/second



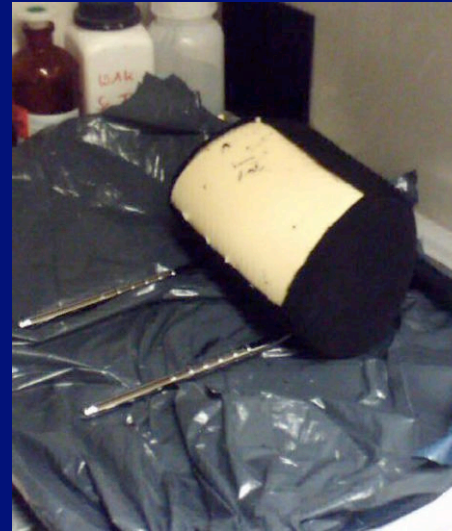
**Po-210 :  $0.23 \pm 0.060$  Bq/cm<sup>2</sup>**

Pb-210 < 0.0073 Bq/cm<sup>2</sup> ( $\gamma$ -spectroscopy)



# Fabric samples

Head-rest from the family car  
9.0 counts/second



Po-210:  $3.1 \pm 0.7$  Bq/cm<sup>2</sup>  
(Grid ionisation chamber)

$4.4 \pm 1.1$  Bq/cm<sup>2</sup>  
(Radiochemistry)

Pb-210:  $< 0.0024$  Bq/cm<sup>2</sup> ( $\gamma$ -spectroscopy)

# INCORPORATION – URINE SAMPLES

59 urine samples were collected from 53 people.  
The median activity in uncontaminated urine was 3.5 mBq/d.

<u>Group tested</u>	<u>24h-activity (mBq/d)</u>	<u>Dose (mSv)</u>
Toddler (urine from nappy)	106.0 / 156.0	0.84 / 1.25
Family of ex-wife	20.0 ± 4.8	0.03 ± 0.02
Special unit forces	4.4 ± 3.8	0.005 ± 0.004

# Thank you for your attention

## Questions?

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12<sup>th</sup> European ALARA Network Workshop, October 2009**

