New procedures for disposal of ICSDs

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28 September 2015
Facts on ICSD
High dose coefficient

**ICSD = Ionisation chamber smoke detector**

- Typical americium-241
  - ISO 2919 (sealed sources)

- Category 1: 37 kBq – 550 kBq
  - For industrial use

- Category 2: 37 kBq
  - For private use

**Americium-241**

- Alpha and gamma emitter
- Half life 432.7 years
- Exemption level $1 \cdot 10^4$

- 20 mSv \(\text{ALI}_{\text{ingestion}}\) $1 \times 10^5$ Bq
- 20 mSv \(\text{ALI}_{\text{inhalation}}\) $5.1 \times 10^2$ Bq
Import
In total ~ 5.5 mill. (5.1 mill. in cat. 2)
 Legislation today

National Board of Health order no. 154 of 6 March 1990 on smoke detectors and consumer products containing radioactive materials with amendments in orders no. 547 of 23 July 1993 and no. 793 of 19 October 1999.

§ 32
Smoke detectors of category 1 and 2 must not be disposed through incineration but must be returned to the deliver or send to Danish Decommissioning.

(2) However, the single consumer may dispose up to 3 smoke detectors of category 2 per month as domestic waste.
Today’s behaviour, however

• Public awareness of correct disposal and recycling
  - Electronic waste
  - Hazardous waste

• Recycling sites
  - Storage → accumulation
  - Incineration
  - Hazardous waste center → incineration
  - Danish Decommissioning
Disposal of WEEE in DK
(WEEE - Waste Electrical & Electronic Equipment)

Consumer

Domestic waste

Recycling sites

Incineration

Collection, recycling industry

Pre-treatment, shredding, separation

Export

WEEE is exported

Shredding of an ICSD could lead to spreading of Am-241

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Sundhedsstyrelsen
National Institute of Radiation Protection
Producer responsibility


- Based on WEEE-directive

- States that ICSDs are covered by producer responsibility

- Consumers actually behave in accordance with the WEEE-directive
New procedure

Cooperation with:
• Danish Environmental Protection Agency (Miljøstyrelsen)
• DPA-System (Danish Producer Responsibility System)

The new procedure:
• Using the exiting waste flow
• No sorting at recycling sites
• A sorting guide for the recycling industry
  - Preventing shredding of ICSDs
• License
  - Storage, separation

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New procedure

Collection, recycling industry (license for storing)

Danish Decommissioning

Separation (license)

Export

Danish Decommissioning

Consumer

Recycling sites

Domestic waste

Incineration

Recycling sites

Collection, recycling industry

Pre-treatment, **shredding**, separation

Export

Consumer
In conclusion

New procedure for disposal of ICSDs...

• ... is in accordance with
  - WEEE directive
  - Intuitive consumer behaviour
  - Fits in the existing waste stream

• ... prevent
  - Storage of large numbers of ICSDs at recycling sites
  - Shredding of ICSDs