Management of Spent Nuclear Fuel and Radioactive Waste – The Governmental View

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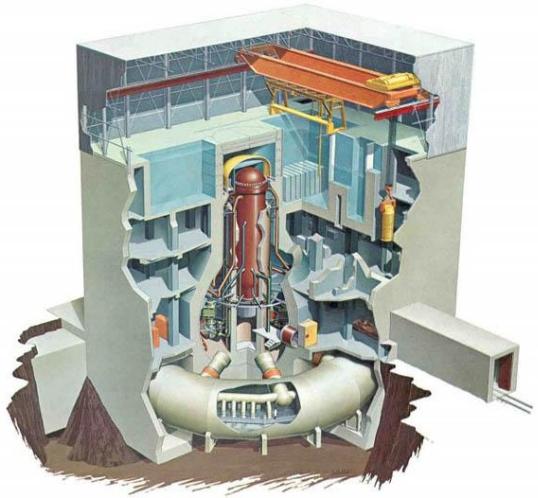
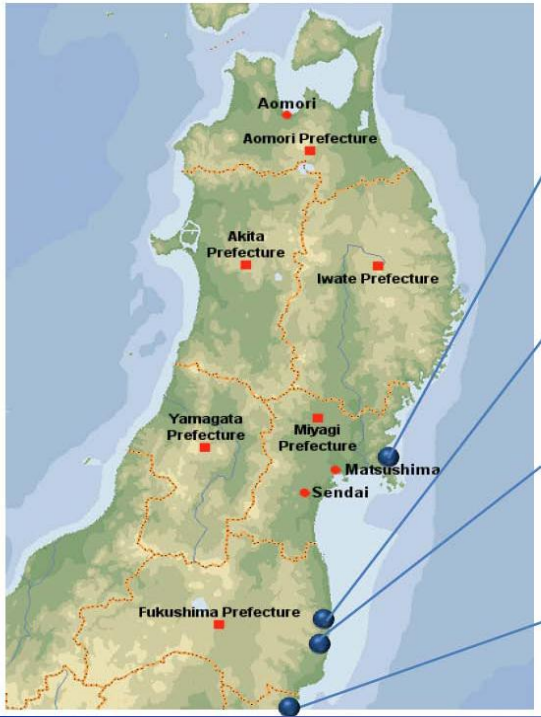
Nuclear events in Japan 2011



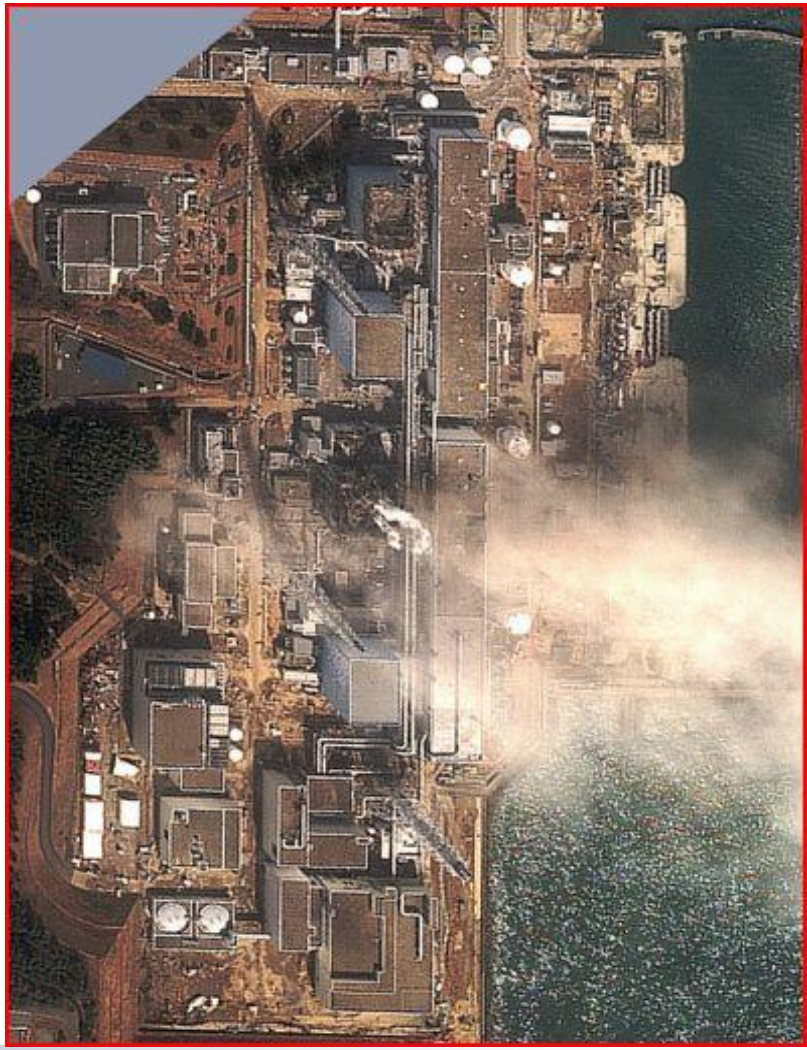


Onagawa
- Unit1: 524 MW, 1984-
- Unit2: 825 MW, 1995-
- Unit3: 825 MW, 2002-

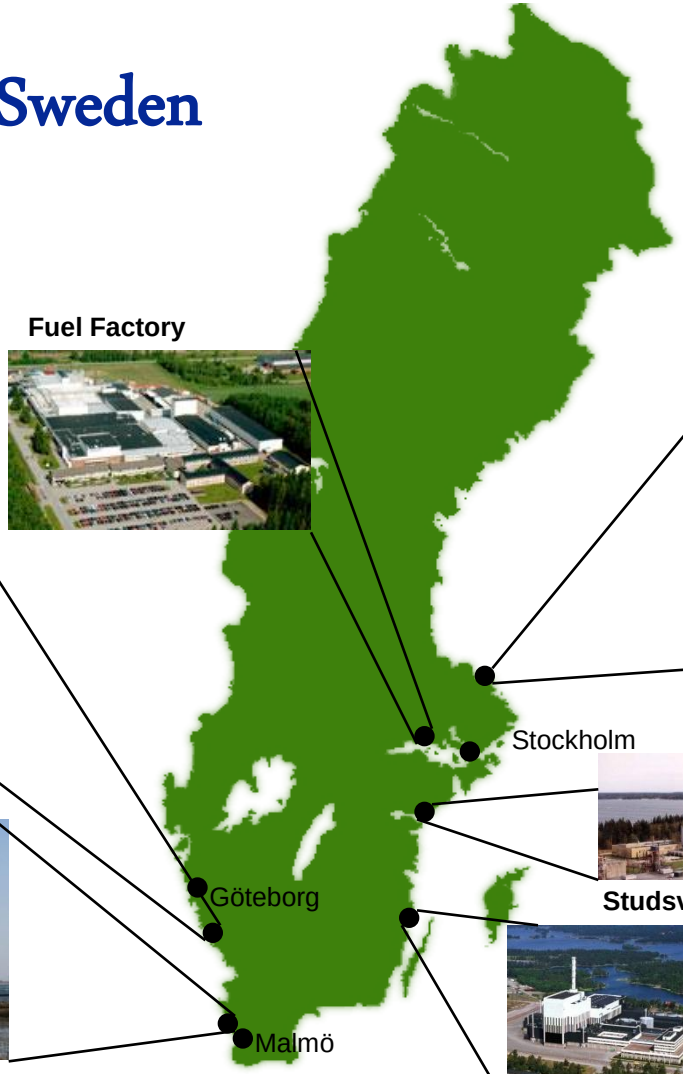
Fukushima Ⅰ
- Unit1: 460 MW, 1971-
- Unit2: 784 MW, 1974-
- Unit3: 784 MW, 1976-
- Unit4: 784 MW, 1978-
- Unit5: 784 MW, 1978-
- Unit6: 1,100 MW, 1979-

Fukushima Ⅱ
- Unit1: 1,100 MW, 1982-
- Unit2: 1,100 MW, 1984-
- Unit3: 1,100 MW, 1985-
- Unit4: 1,100 MW, 1987-

Tokai Ⅱ (1,100 MW, 1978-)



Nuclear geography in Sweden



Forsmark NPP (3xBWR)
Operational waste repository

Ringhals NPP (3xPWR + 1BWR)

Studsvik, Research reactor (perm. closed)

Barsebäck NPP (2xBWR) permanently closed

Oskarshamn NPP (3xBWR)
Central Interim Storage
Clab

Ethical principles

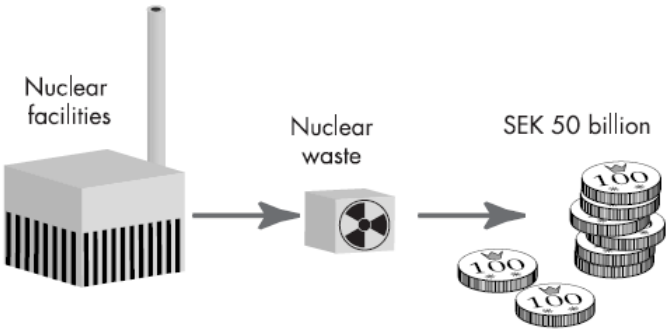
- **Generation Responsibility**
  - It is the generation that benefits of nuclear energy that should solve the waste problem
  - It should ***not*** be left to future generations to solve…
- **Polluters Pays Principal**

  ***Industry has to*:**
  - Finance the disposal of the spent nuclear fuel
  - Find a safe technical solution to the disposal of the spent nuclear fuel

The Swedish model

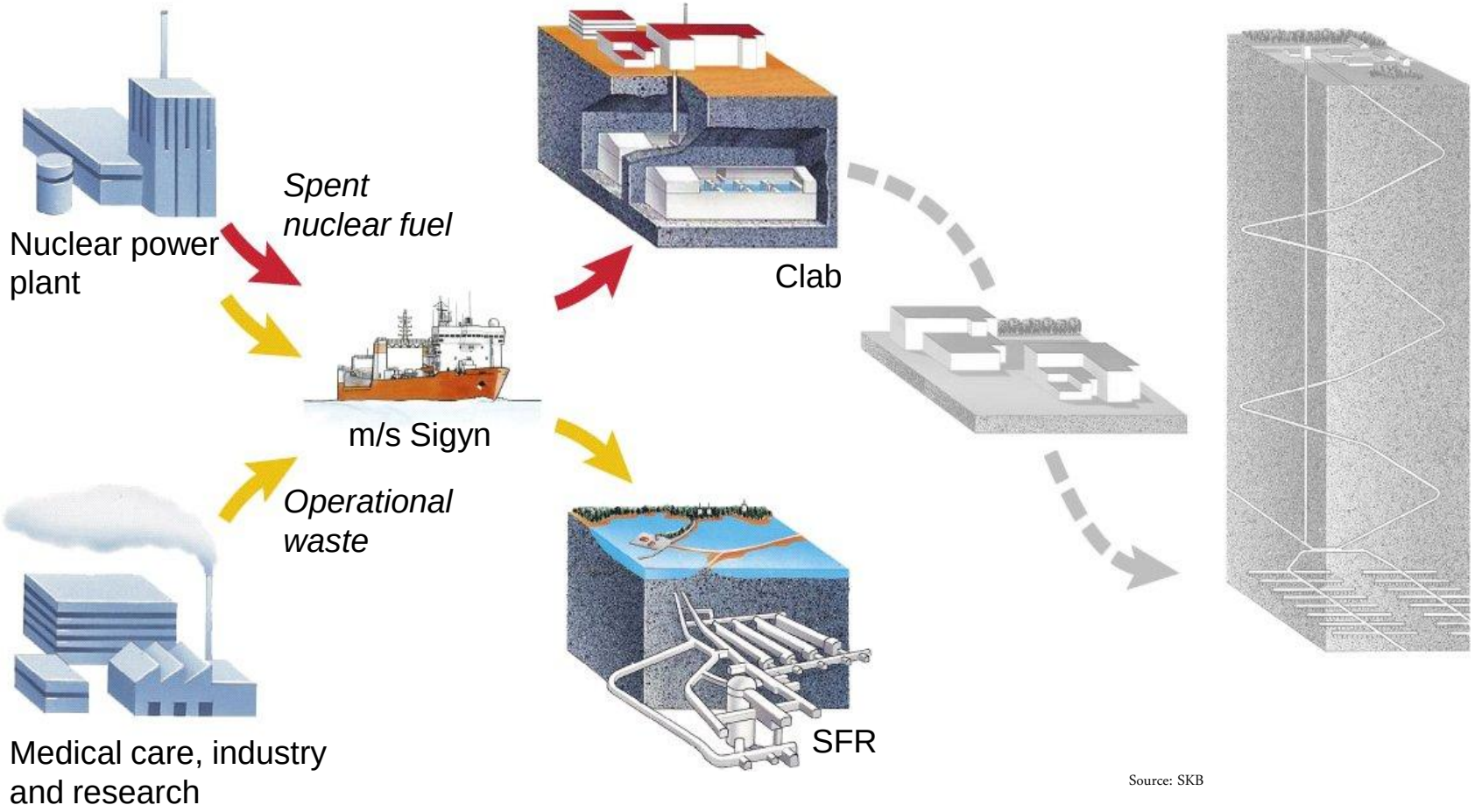
- A legal framework covering the whole field
- A clear distribution of responsibilities
- A financing system

The Responsibility of the Nuclear Industry



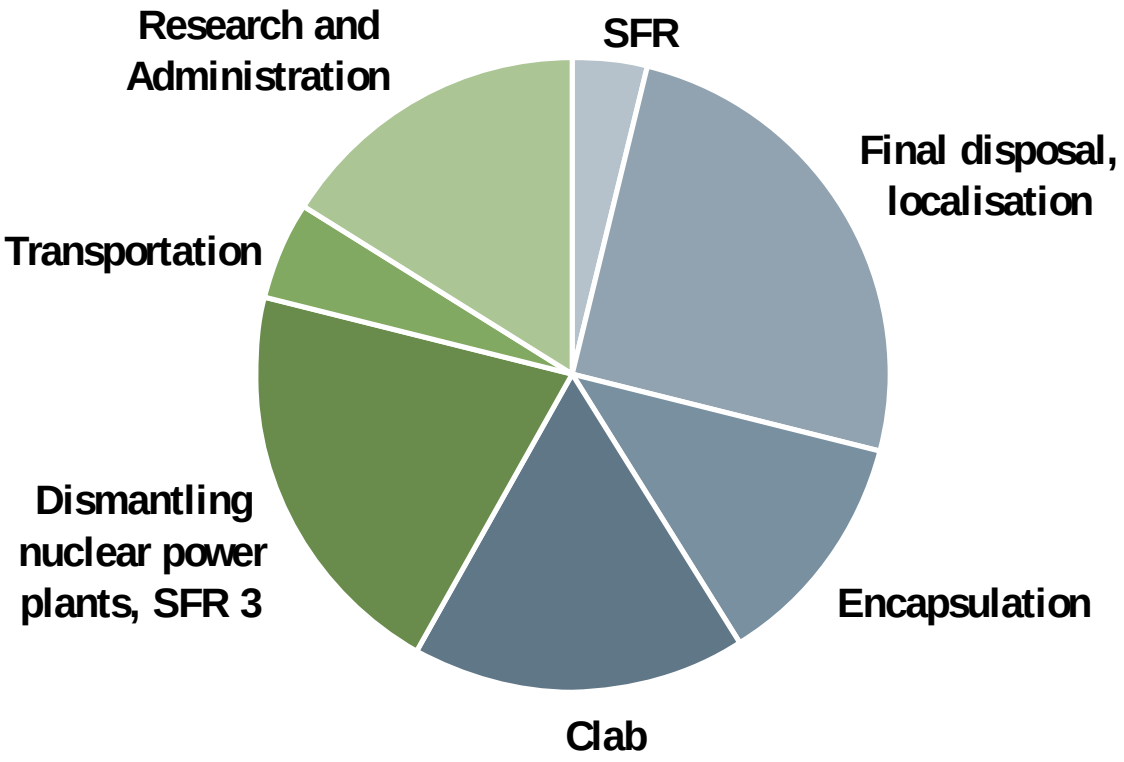
- Full responsibility for safely managing radioactive waste and spent nuclear fuel
- Full responsibility for all expenses regarding disposal
- Fees paid to an independent fund

Swedish Waste Management System



Source: SKB

Total Cost of Around SEK 100 Billion



The Swedish Spent Nuclear Fuel

- Total of 9 000 tonnes
- 140 tonnes reprocessed into MOX-fuel
- 4,8 tonnes from the first research reactor, to be reprocessed at Sellafield

Application for final repository

On March 16 Swedish Nuclear Fuel and Waste Management Co sent in its application for

- a final repository for operational nuclear waste in Forsmark, municipality of Östhammar

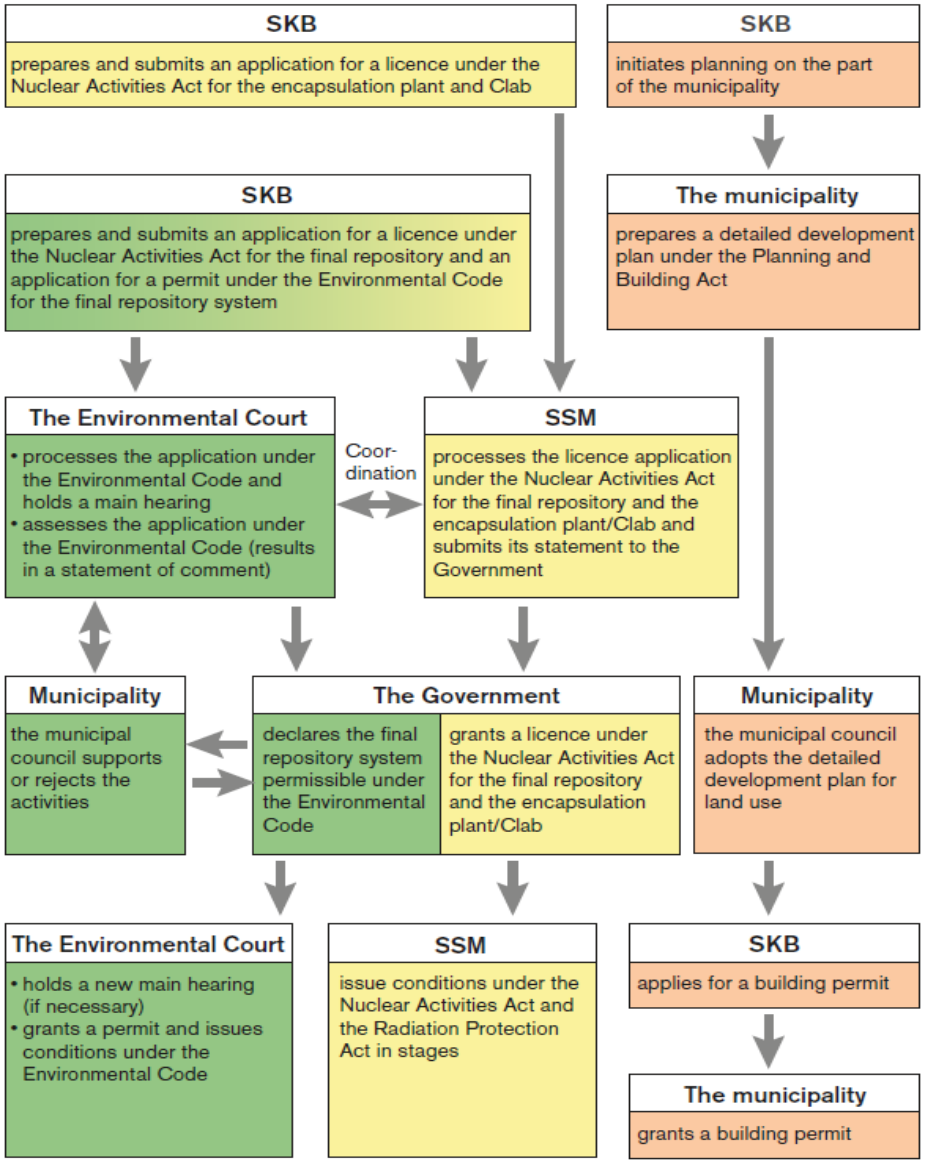
- Encapsulation installation at Central interim storage for spent fuel in municipality of Oskarshamn

Two applications

- Application to Land- and Environmental courts according to Environmental Code
- Application to Swedish Radiation Safety Authority according to the Nuclear Activities Act
- The Government decides on permission according to these acts
- The two municipalities are to be consulted

Several years of processing

- Swedish Radiation Safety Authority 2 -4 years
- International scrutiny/ranking
- Wide national consultation
- Information to Parliament


SKB
prepares and submits an application for a licence under the Nuclear Activities Act for the encapsulation plant and Clab
SKB
initiates planning on the part of the municipality
SKB
prepares and submits an application for a licence under the Nuclear Activities Act for the final repository and an application for a permit under the Environmental Code for the final repository system
The municipality
prepares a detailed development plan under the Planning and Building Act
The Environmental Court
• processes the application under the Environmental Code and holds a main hearing
• assesses the application under the Environmental Code (results in a statement of comment)
Coor-dination
SSM
processes the licence application under the Nuclear Activities Act for the final repository and the encapsulation plant/Clab and submits its statement to the Government
Municipality
the municipal council supports or rejects the activities
The Government
declares the final repository system permissible under the Environmental Code
grants a licence under the Nuclear Activities Act for the final repository and the encapsulation plant/Clab
Municipality
the municipal council adopts the detailed development plan for land use
The Environmental Court
• holds a new main hearing (if necessary)
• grants a permit and issues conditions under the Environmental Code
SSM
issue conditions under the Nuclear Activities Act and the Radiation Protection Act in stages
SKB
applies for a building permit
The municipality
grants a building permit

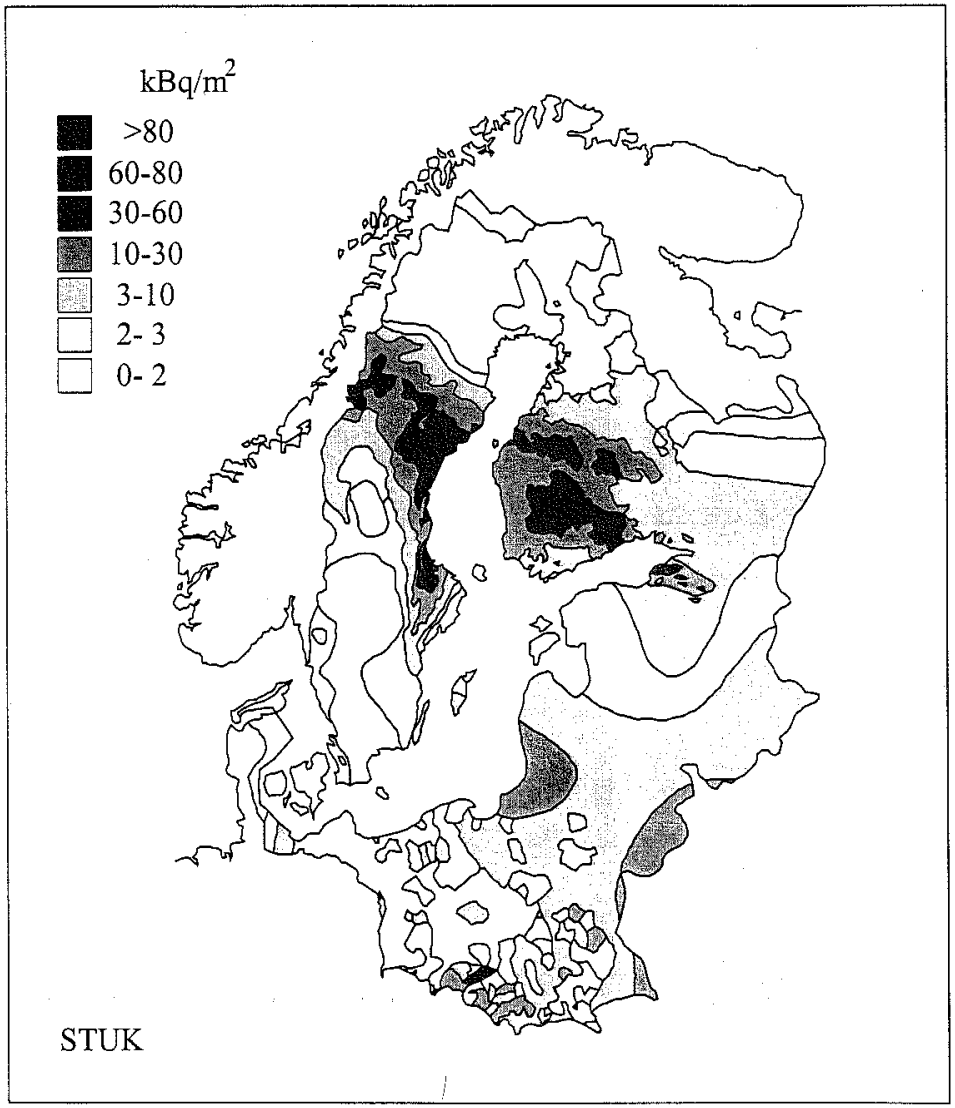


Fig. 1. Terrestrial deposition of Chernobyl-derived ^{137}Cs in the drainage area of the Baltic Sea in 1987 (compiled by STUK).

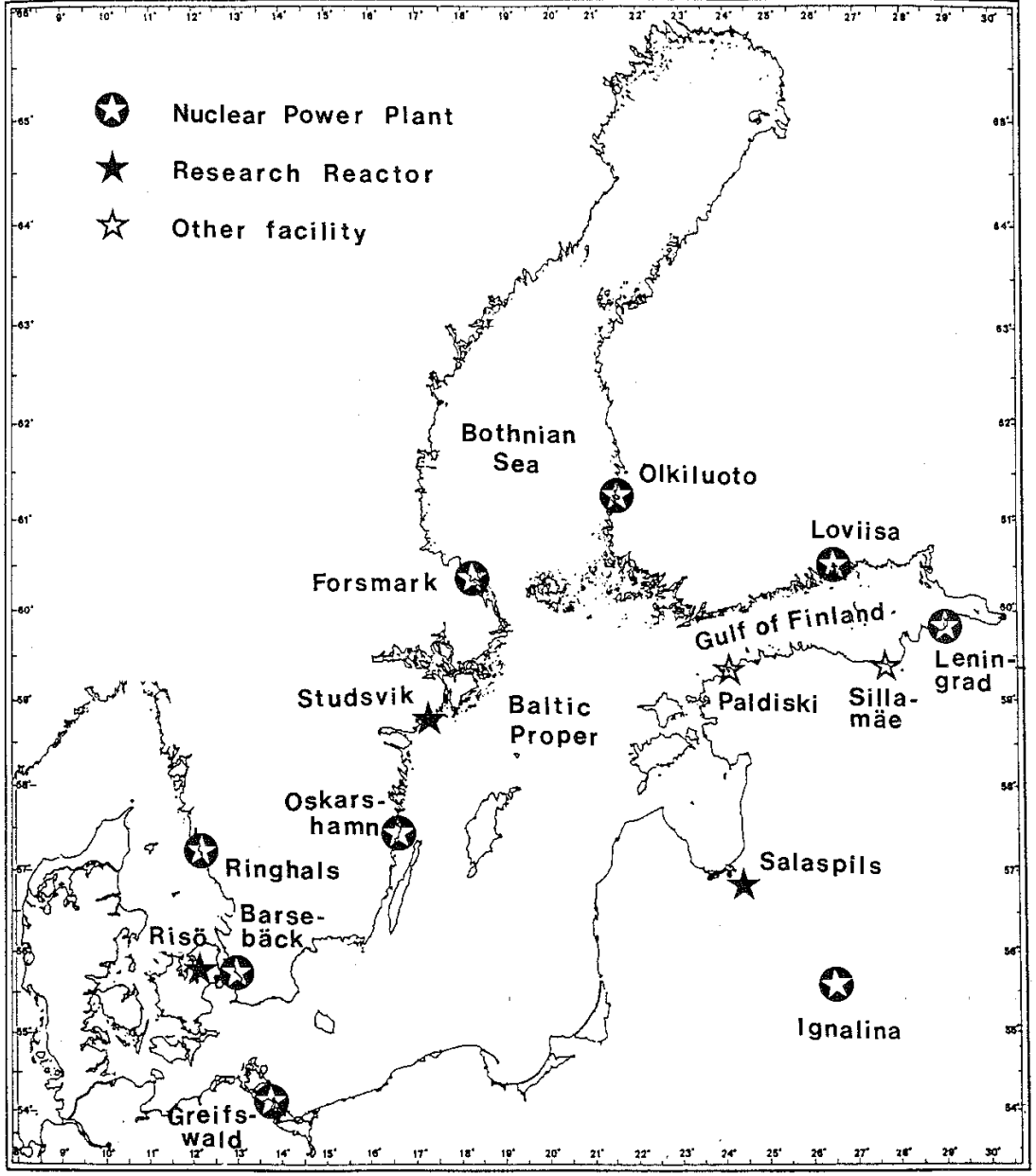


Fig. 2. Nuclear power plants, research reactors and other nuclear facilities in the Baltic Sea region.