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Status of facilities and decommissioning in Sweden

Ingemar Lund
Swedish Radiation Protection Authority
Philippines, June 2006

 *Statens strålskyddsinstitut*
Swedish Radiation Protection Authority

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Ministry and Authorities




Ministry of Sustainable Development

Mona Sahlin
Minister for Sustainable Development

Lena Sommestad
Minister of Environment

Nuclear Safety and Radiation Protection

- Swedish Nuclear Power Inspectorate (SKI)
- Swedish Radiation Protection Authority (SSI)
- Swedish National Council for Nuclear Waste (KASAM)

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Legal Framework

Acts and Ordinances

- Nuclear Activities Act
 - Nuclear Activities Ordinance → SKI (SSI)
 - Radiation Protection Act
 - Radiation Protection Ordinance → SSI (others)
 - Work Environment Act Swedish Work Environment Authority
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- Environmental Act → Environmental courts
 - Ordinance (1998:905) on Regional Administrations Environmental Impact Assessment

Nuclear facilities in Sweden



- Four NPP Sites
 - June 2006: 10 operating reactors, three closed
- The Studsvik Site
 - closed research reactors, waste facilities
- A Nuclear Fuel Factory
- Interim Storage (CLAB) & Waste Repository (SFR)
- A Siting Process...

Transport Vessel-SIGYN

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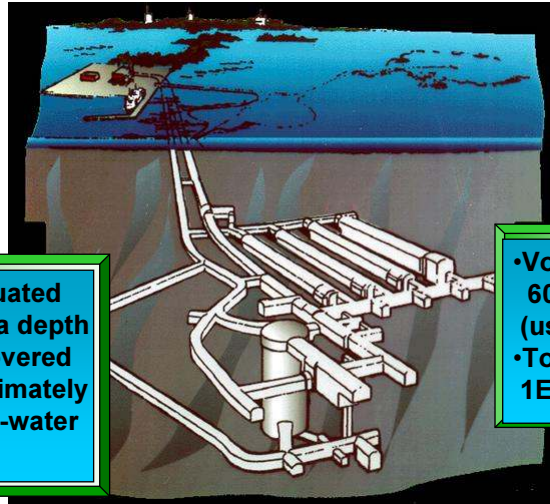
SFR Repository, LLW & ILW Wastes



Facilities are licensed to Swedish Nuclear and Fuel Waste Management Company – the SKB

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SFR is situated in rock at a depth of 60 m covered by approximately 5 m of sea-water

•Volume ~ 60,000 m³
(used 31,000)
•Total activity 1E 16 Bq

CLAB

- Interim storage for spent nuclear fuel
- Presently holds about 4,350 tonnes spent uranium



Operated by and licensed by the SKB

Several Decommissioning Projects during 1980 - 2000

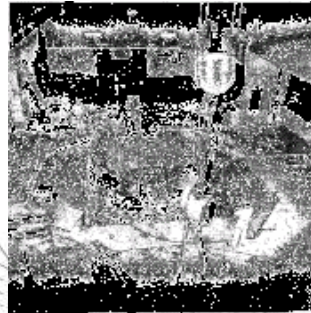
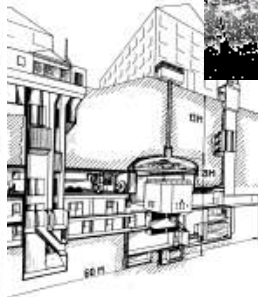
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Decommissioning of-
Van de Graaff accelerator
AB SVAFO / Studsvik AB



Van de Graaff
1960 - 1989

R1-reactor
1954 - 1970



R-0, Kritiz, Laboratories etc.

Ågesta

Nuclear power
plant 10 km south
of Stockholm:
PHWR, 105 MWth
1964-1974
Partially
decommissioned



Vattenfall AB / AB SVAFO

Studsvik - ACL

Nuclear material U/Pu-processing laboratory at Studsvik

Decommissioning 2000 - 2005

SSI performed spot-checks of licensee measurements (2004)

Building/site released during 2006 - To be demolished



Studsvik ACL Laboratory

Studsvik – R2/R2-0

SSI Research reactors closed in summer 2005

1960 - 2005

50 & 1 MW_{thermal}

Stepwise decom. is foreseen

New SAR and updated decommissioning plan are presently developed



The R2 reactor is presently used for the production and testing of various fuel and reactor materials, as well as for neutron irradiation services.

Barsebäck 1 & Barsebäck 2

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Twin BWR units
2 x 615 MW electric
Closed 1999 and 2005
→ New SAR is prepared (adopting to closed reactors without spent fuel)
→ Updated radiological inventory

IAEA Safety assessment - "test case A"

New Turbines & Power Upgrades

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2004 - 2010

- New, effective turbines
- Increase thermal power → fuel burn-out, enrichment, core parameters

Relevant regulations

- SSI • SKIFS 2004:1 Safety in Nuclear Facilities (SAR, Decom plan)
 - SSI FS 2004:2 Planning before and during Decommissioning of Nuclear Facilities (Decom plan, Projected doses etc..)
 - AFS 1999:3 Building and Civil Engineering Work
 - AFS 2001:1 Systematic Work Environment Management
 - AFS 2000:4 Chemical Hazards in the Working Environment
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- SFS 1998:905 Environmental Impact Assessment