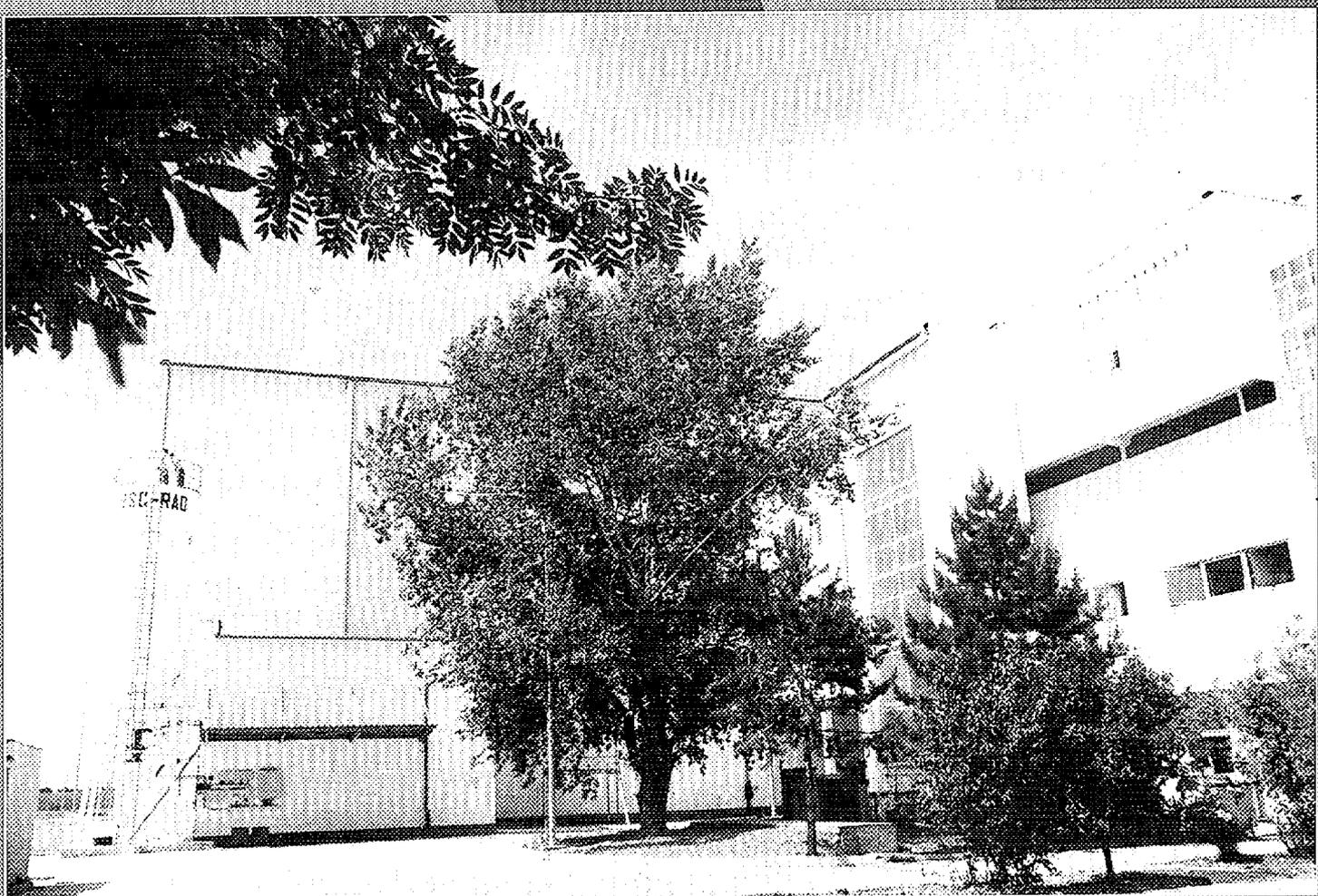


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RADWASTE TREATMENT CENTRE JASLOVSKÉ BOHUNICE



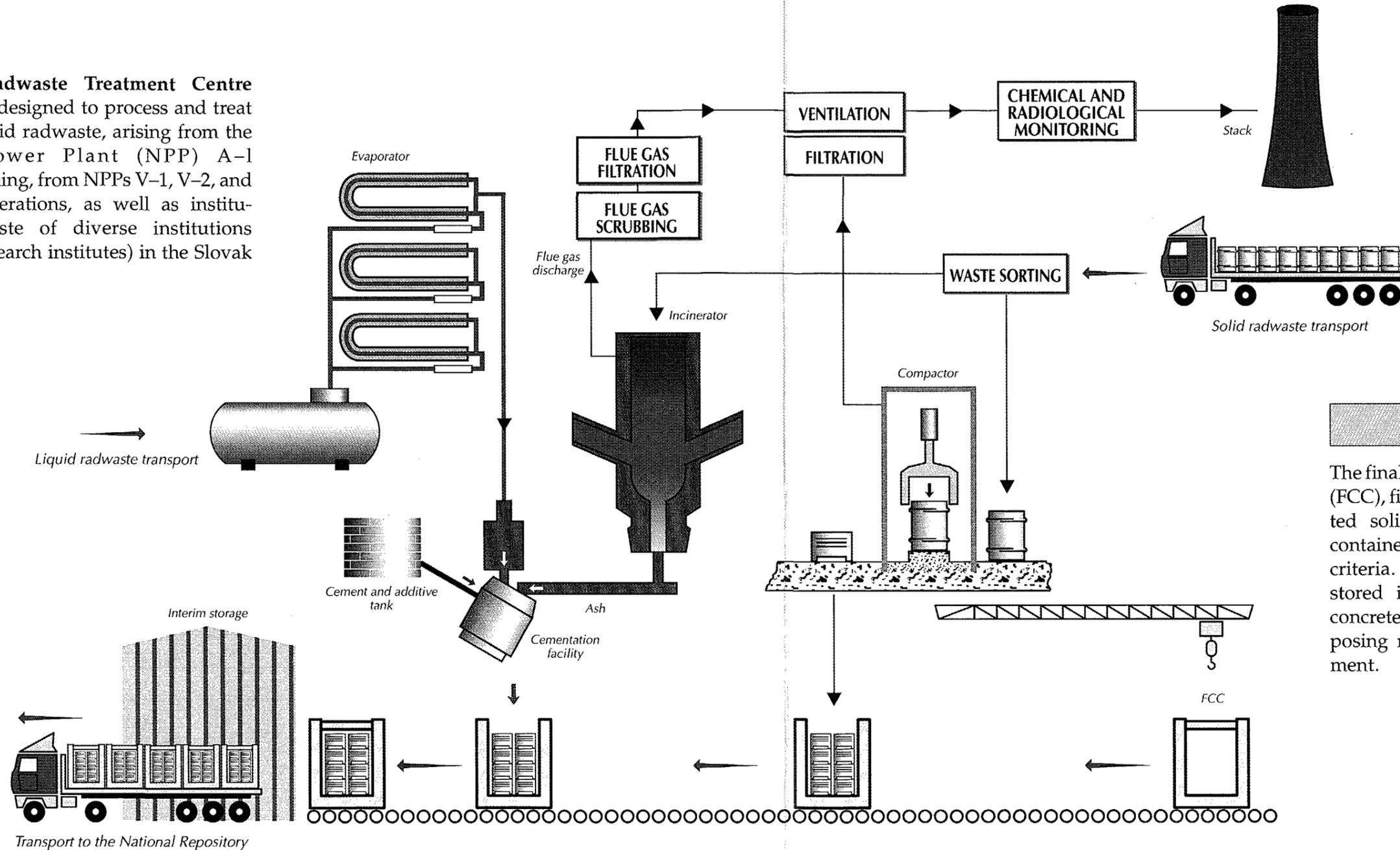
DECOMMISSIONING OF THE NUCLEAR
INSTALLATIONS, RADIOACTIVE WASTE
AND SPENT FUEL MANAGEMENT
JASLOVSKÉ BOHUNICE



SLOVENSKÉ
ELEKTRÁRNE

TREATMENT OF RADWASTE IN BOHUNICE TREATMENT CENTRE

Bohunice Radwaste Treatment Centre (CENTRE) is designed to process and treat liquid and solid radwaste, arising from the Nuclear Power Plant (NPP) A-1 decommissioning, from NPPs V-1, V-2, and Mochovce operations, as well as institutional radwaste of diverse institutions (hospitals, research institutes) in the Slovak republic.



FINAL PRODUCT

The final product is a fibre concrete container (FCC), filled with cement mixture, or cemented solid radwaste, checked against the container transport and National Repository criteria. Activity, fixed in the cement matrix, stored into the long-term integrity fibre concrete container, represents safe storage, posing no hazards to humans or environment.

TRANSPORT

The solid radwaste for sorting and high-force compacting is transferred in uniform units (200 litre drums). Within the CENTRE, conveyors and material handling trucks are used for internal transport. The liquid radwaste is transported either in special containers or via a pipe line. The processed cement matrix radwaste, stored in fibre concrete containers, is handled by special trucks and conveyors.

SORTING

The solid radwaste is prepared for treatment in the sorting room (comprising a sorting box and a fragmentation equipment) to make it suitable for the subsequent treatment and process at the technological units within the CENTRE. The waste is sorted according to the following criteria:

- combustible
- compactible
- non combustible and non compactible

INCINERATION

This treatment is adequate for incineration of solid and liquid radwaste. A two-chamber incinerator comprising a main incineration chamber and afterburner chamber is used. The effluent gas from the incinerator is purified in high performance scrubbers followed by cellulose filters. The ashes and scrubber water are treated by cementing.

COMPACTING

The solid compactible radwaste is compacted in the 200 litre drums in the compaction facility by the use of a high-force compactor. The compacted drums (pellets) are placed in 3 m³ fibre concrete containers and transported to the cementation facility for filling of the voids between the compacts and the concrete container.

CONCENTRATION

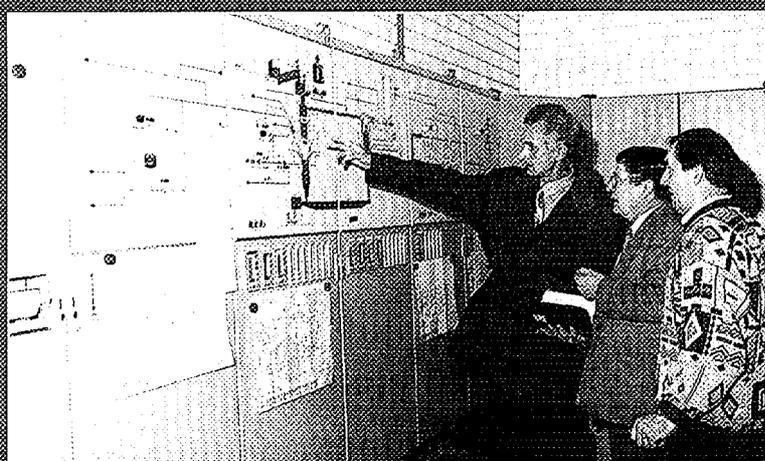
The liquid radwaste is concentrated in a through-flow evaporator with steam as a heating medium. Chemical treatment precedes the concentration. Final products of the process are a concentrate subsequently treated at the cementation facility, and a waste vapour condensate, discharged into environment after active purification and control.

CEMENTATION

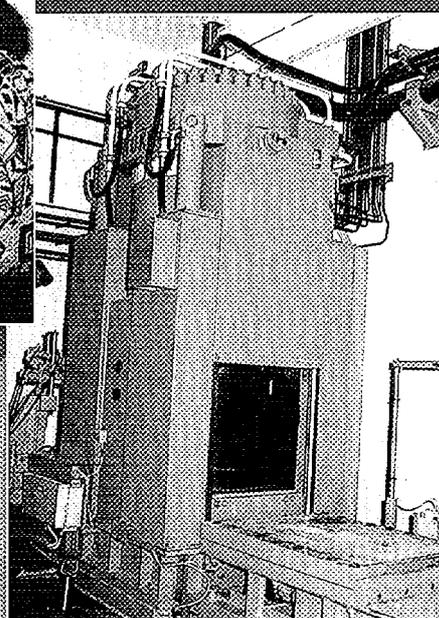
The liquid radwaste (e. g. concentrates, ion exchange resins, sludge, and scrubbing water from the incinerator) and ashes are processed according to the relevant formulae, mixed with cement or other components (lime, additives). The solid radwaste (cut in pieces, 200 litre drums, compacted units) is placed into special fibre concrete containers, cemented either by active or inactive cementing mixture and sealed.

MONITORING OF EMISSION

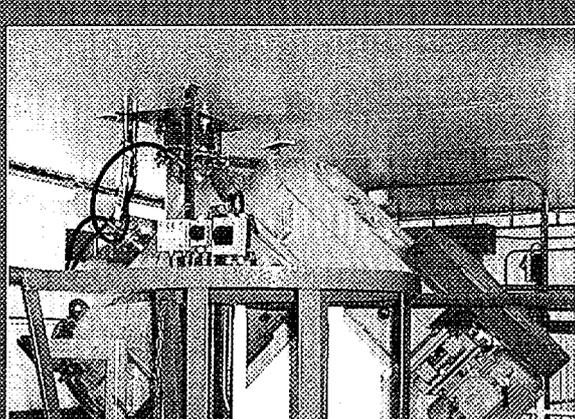
The gaseous releases (flue gases from the incinerator, air from the CENTRE internal processing areas) are released into atmosphere through the ventilation stack. Continuous and consistent monitoring of the chemical effluents and active discharges ensures compliance with the authorised limits.



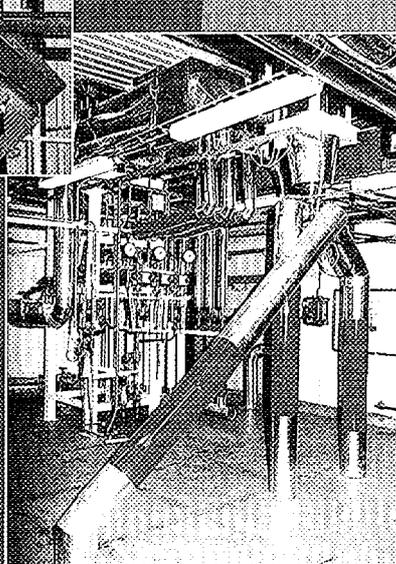
Incineration facility control room



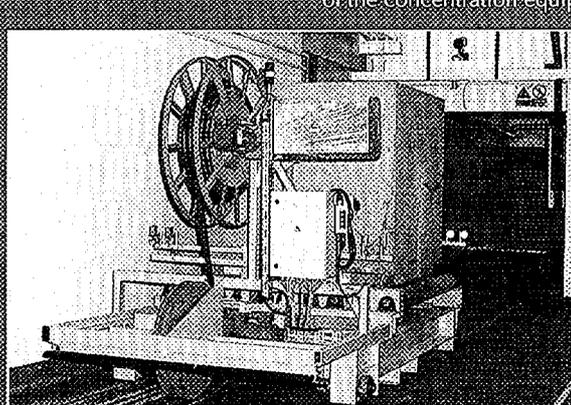
Compactor



Cementation facility slant mixer



Evaporator and partial view of the concentration equipment



FCC transport truck

EVAPORATOR

Evaporator Type	through-flow
Operation	continual - campaign
Heating Medium	steam of about 0.5 MPa
Heating Temperature	105 - 108 °C
Heat Exchanging Surface	9.6 m ²
Throughput	300 - 400 dm ³ /hour
Concentration	max. 500 g/dm ³
Decontamination factor	10 ⁴

CEMENTATION

Operation	non continual
FCC Volume	3.0 m ³
Slant Mixer Volume	0.5 m ³
Throughput	1 - 1.5 FCC/shift

COMPACTION

Pressing Power	20 000 kN
Volume Reduction Factor	4 - 8
Throughput	max. 10 drums/hour
Compacting Package	200 litre drums

INCINERATION

Operation	continual - campaign
Throughput	50 kg/hour (solid radwaste) 30/10 kg/hour (solid/ liquid radwaste)
Incineration Temperature	Stage 1 750 - 850 °C Stage 2 1 000 - 1 200 °C
Flue Gas Flow Rate	2 000 - 2 500 m ³ /hour
Ash Content	max. 4 kg/hour
Volume Reduction Factor	80 - 150
Decontamination Factor	10 ⁵ - 10 ⁷

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