

The background image shows the Ringhals Nuclear Power Plant (NPP) facility. It features several large, modern buildings with white and grey facades, a prominent cylindrical containment dome, and a tall chimney stack. The plant is situated behind a stone wall that borders a body of water. In the foreground, there is a rocky shoreline on the right side. The sky is clear and blue.

Ringhals NPP

Potential harvesting of radiated concrete

Hybrid Workshop on International Concrete Harvesting

2024-10-04, Johanna Spåls

This is Ringhals

- a part of Vattenfall BA Generation

Ringhals 1

BWR, ASEA ATOM
Commercial operation 1975
Shut down 2020

Ringhals 2

PWR, Westinghouse
Commercial operation 1975
Shut down 2019

Ringhals 3

PWR, Westinghouse
Commercial operation 1981
Planned service life 60 years

Ringhals 4

PWR, Westinghouse
Commercial operation 1983
Planned service life 60 years

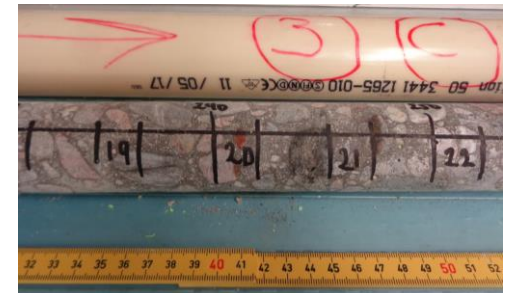
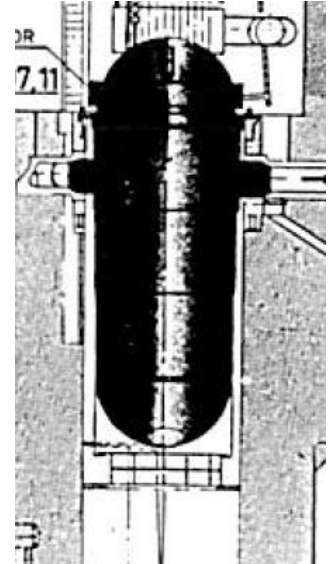
Decommissioning of Unit 2

- Shut down 2019
- Decommissioning is ongoing
- Preparatory work
 - Some of the tendons are detensioned
 - Hole is done through the wall between containment and fuel building
 - Hole between containment and outdoor is being prepared



Concrete Biological Shield Effects of radiation

- 3 loop-PWR, operated 43 years
- 50 mm cores has been drilled to measure contamination levels
- Calculation of biologic shield shows that the radiation level is above the threshold level for the inner 50 mm of the concrete structure



Material characterization

- Planning on taking out concrete samples for characterization during this fall
- Unirradiated concrete with the same material properties as the biological shield
- Testing performed by Oak Ridge National Laboratory

Intyg nr V 2-902

STATENS VATTENFALLSVERK
RINGHALSARBETENA

Uppdragsgivare: Statens Vattenfallverks
Föremål: 3 st 15 cm kuber av betong Provingsdatum: 9/3-73

Erhållna uppgifter om betongprover:

Tillverkningsdatum: 8/12-72
Uppgiven märkning: N 416 N 418 N 420
Arbetsplats: Ringhals
Byggnadsdel: Reaktorången ett 1802
Betongbeteckning: Btg I K 400 P LH
Cementhalt: 320 kg/m³
Blandningsförhållande: I:2,75:3,30
Vattencementtal: 0,48
Tillformningsätt: Puddling o vibrering
Sand: Björkholmen
Sten: Östad 32 mm
Övriga uppgifter: Skakbord 43 40 51 cm

PROVNINGRESULTAT

Provingen utförd e enlighet med Statliga Betongbestämmelser av år -65
Kravet på planhet hos tryckytorna var uppfyllt
~~500 kg/cm²~~

Inristad märkning	Ålder vid provning dgn	Volym- vikt kg/åm ³	Tryckhåll- fasthet kg/cm ²
N 416	91	2,37	488
N 418	"	2,38	516
N 420	"	2,35	492
	Medelvärde	2,37	500

Ringhals, 9 / 3 1973

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Thank you for your attention!