

A sunset scene with a nuclear power plant silhouette reflected in water. The sun is low on the horizon, creating a bright orange and yellow glow. The power plant structures, including cooling towers and chimneys, are silhouetted against the sky and reflected in the calm water below. The overall mood is serene but carries a sense of industrial scale.

Incident with exposure to high dose rate

When the RP tech's instrument is faulty

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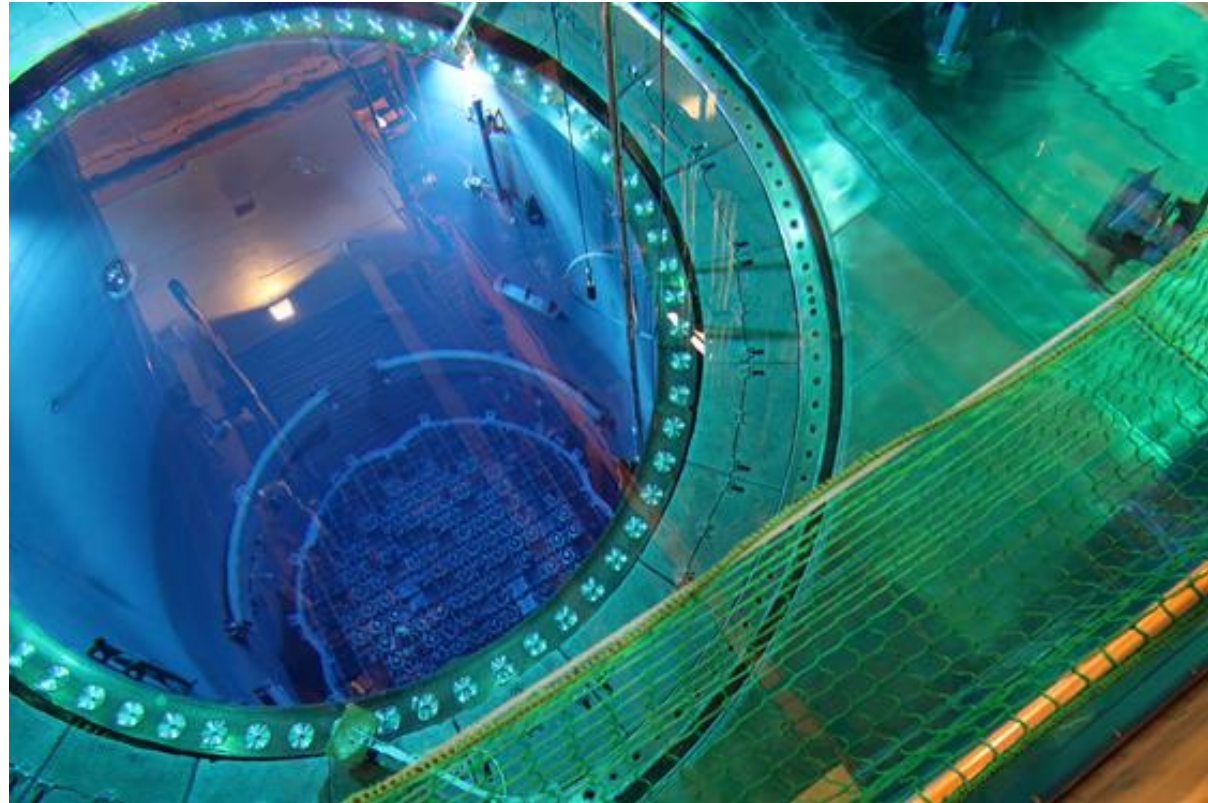
2023-06-27

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Agenda

1. Background
2. Instrument
3. Aftermath

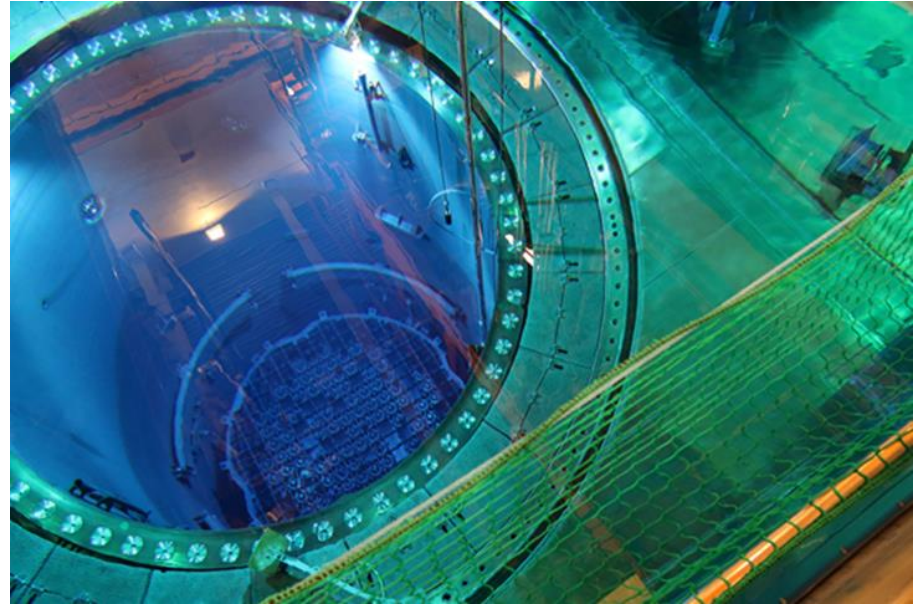




Background

Cleaning the cavity

- Friday afternoon, November 29, 2019, a routine job
- Changing the filterbag in the cleaning equipment has to be done manually.
- Highly experienced staff on all positions
- RP tech measuring dose rate with instrument



Instrument



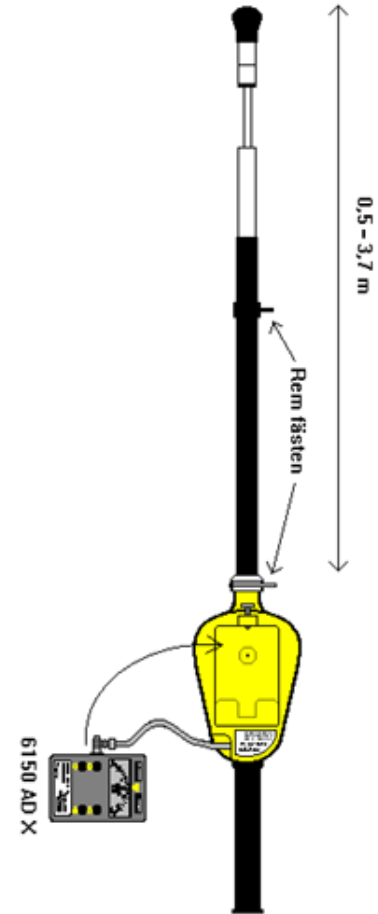
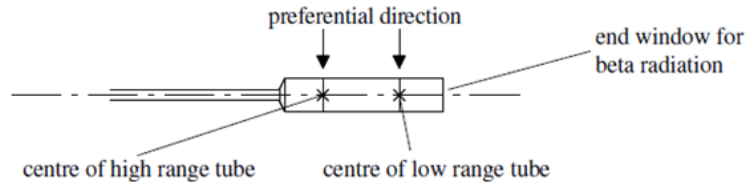
The instrument

- Automess 6150 AD-t

Measuring range: 0,1 $\mu\text{Sv/h}$ - 10 Sv/h
Low range: 0,1 $\mu\text{Sv/h}$ - 10 mSv/h
High range: 1 mSv/h - 10 Sv/h

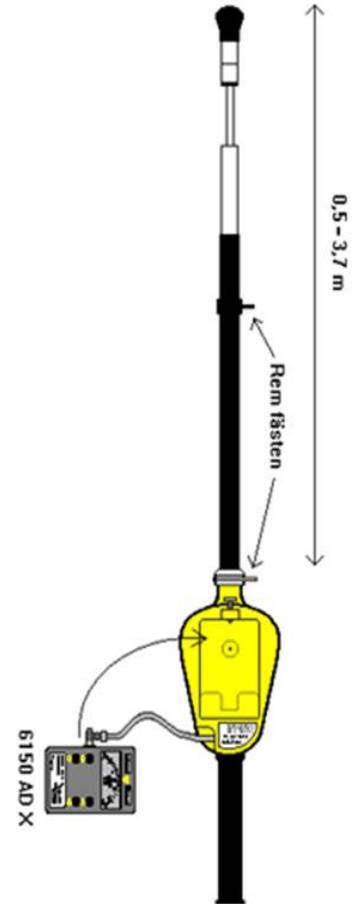
Energy range: 65 keV - 1,3 MeV (low range tube)
65 keV - 3 MeV (high range tube)

Detector: 2 GM-tube. (ZP 1400 (LDR), ZP 1300 (HDR))



Deficiencies in the use of the instrument

- Function test before use, but only for the low dose rate tube
- We didn't have a source to do a function test of the high dose rate tube, that was a known problem for many years
- RP tech used the instrument without full understanding of its properties.



Aftermath

Aftermath

- Highest individual dose was 1,70 mSv, well under our yearly limit of 20 mSv. Verified by both EPD and TLD.
- The same person got exposed to a dose rate of 1,73 Sv/h (EPD).
- Incident classed as INES 1 according to both Forsmark and SSM.
- Gamma spectrometry showed that Co-60 was the main source.



Aftermath

- Sources to do function tests of the high dose rate tube purchased
- Reinforced training for RP technicians
- Sorting out old instruments that often need repairs
- A comprehensive review of questions regarding radiation protection in pre job briefings





Thank you for listening