Challenges for the Barsebäck Nuclear Power Plant's RP team: From operation to dismantling and "Green field"

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1 INTRODUCTION

The two BWR reactors at the Barsebäck site were shut down in year 1999 and 2005 after a political decision. The dismantling and decommissioning was decided not to be started until the Swedish repositories are ready due to the original time plan, in appr. 2020. This gave the organisation some benefits but also many challenges. It is estimated that the total dismantling will take five years from start.

2 AGGRAVATING CIRCUMSTANCES

- A change from the original plan with a low intensive care of maintenance of the power plant to a decision to use the site for education and R & D.
- The final goal for the site is not yet decided. "Green field"or "Brown field"?
- The dismantling technique has not yet been decided, nor the overall organisation.

Barsebäck NPP today.

Will "Green field" be the final goal?
Manipulated photo.

3 CHALLENGES

- How to remain the personnel and knowledge under such a long period?
- How to prepare the station for the dismantling, decontamination or not, other possibilities?
- Dose considerations.
- New work areas, extremely large components, site restoration, groundwater problems and more.
- Characterisation of building, land, materials and components.
- Waste handling.
- Competence problems with the new contractors, contractors not used to work in NPPs.

4 DECONTAMINATION 2007

As an essential tool to reduce the dose rates in the stations, a decontamination was performed in 2007/2008 at unit 1 and 2 of the primary systems and the lower parts of the reactor vessels.

Both units needed three decontamination cycles and the collective dose in total for both units was 138 mSv.

The dose rate reduction was significant and made it possible to use the station for extensive, full scale, training courses in a realistic environment. Without giving the "students" significant doses. This is ALARA!

	UNIT 1	UNIT 2
DF - overall	298	93
Average dose rate before	0.7 mSv/h	0.8 mSv/h
Average dose rate after	0.03 mSv/h	0.03 mSv/h
Volume / surface	160 m^3 / 1 800 m^2	160 m^3 / 1 800 m^2
Anion / Cation	1 000 l / 4 000 l	1 000 l / 3 000 l

5 RADIOLOGICAL CRITERIA AND PROCEDURES

Today's activities at the PP must NOT increase costs for the decommissioning or create problems for safety and environment during the dicommissioning. In this sense all jobs has to be radiologically planned for two situations – today's execution and tomorrows dismantling. The RP team has to value:

- Dose considerations.
- Environmental impact.
- Waste volumes and treatment.

Other areas that have to be judged are:

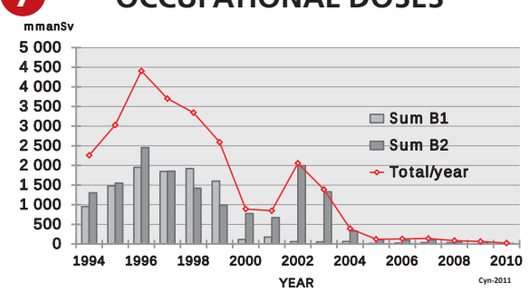
- Measurements technology, airborne activity.
- Measurment for very low level waste, potentially for free release.
- Handling of extreme components, activity and/or size/volume.

6 THE "KAKA" PROJECT

- On site characterisation of:
  - Land, soil, groundwater and sediment.
  - Buildings and system.
- The content of environmental influence such as hydrocarbon, solvent, metals etc. and radioactivity such as Co-60, Cs-137, Ni-63, H-3, Pu-239/240 and Pu-241.

The result of the measurements has shown and proven expected values and nuclides.

7 OCCUPATIONAL DOSES



8 DISCUSSION

Facts that complicates the RP work:

- The dismounting method is not yet decided.
- Unexperienced workers and contractors at the time for dismantle.
- Many and large components to be dismounted.
- Some instruments has to be replaced due to the new and "harder" work environment and/or for new tasks.
- Possible conflicts between ALARA and BAT.

9 SUMMARY

- The RP team must be involved in the beginning of the planning process.
- The dismantling must proceed in a way that is optimized not only on Financial grounds but also on Safety and Environmental grounds.