Review of a completed Decommissioning Project:

The Eurochemic Reprocessing Plant in Belgium

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Eurochemic
• 181 t of natural and slightly enriched uranium fuels (<4.5% initial U235-enrichment) from various experimental and power reactors

• 31 t of high enriched uranium fuels from testing reactors

677 kg Pu

1363 kg U
Rehabilitation of Eurochemic

- ‘Rinsing’ of the installation (ALARA)
- Radiological status in 1981
  - Surface Contamination levels up to a few 100 Bq/cm² in alpha and beta-gamma
  - Contamination in depth
  - Hot spots up to a few 10’s mSv/h => hands-on
  - No activation
Pilot Project
Main lessons

- Emphasis on decontamination of:
  - Metal components
  - Concrete structures
Unique strategy

- Avoid any spread of contamination
- Far reaching decontamination in view of unconditional release
- Minimal quantities of radwaste
- Optimization of recycling and exhaust opportunities for reuse of valuable components
Rehabilitation of Eurochemic

- Relevant data:
  - Length 90 m, width 27 and height 27 m
  - Volume: 56,000 m³
  - Concrete volume: 12,500 m³
  - Concrete surface: 55,000 m²
  - Metal: 1,500 ton

- 7 floors, 40 large cells

- 106 cell structures
Far-reaching decontamination

New technologies, ergonomic tools
Decommissioning strategy

- Rinsing program
- Removal of systems and components
- First decontamination of the structure
- Removal of embedded piping
- Decontamination of the structure
- Release measurements

Brownfield
Far-reaching decontamination
Doorgedreven decontaminatie
Dismantling
SAFETY

- Focus on accelerated risk reduction

- Safety of our in house staff and our contractors is and has always been a top priority
Safety first!

- Dose rates
  (average < 2 mSv/year.person over 1990-2013)

- Contamination risks
  (Protective clothing, silicon mask)

- Conventional safety
  - Circumstances comparable to construction industry
  - Hand-arm vibrations
Radwaste management
Results

- Production rates
- Planning (man.years)
- Budget & costs
Production rates for concrete

- Demolition included

![Diagram showing production rates for concrete](image-url)
Production rates for metal

- **Demolition included**

![Diagram](image.png)
Results: man.year

- Initial estimation: 400 man.year
- Final result: 570 man.year

Why? :
- Inventory differences
- Decontamination in view of free release
- Labour intensive release measurements and stringent release procedures
Results: budget, costs

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<tbody>
<tr>
<td></td>
<td>M€1992</td>
<td>M€2013</td>
<td>M€2013</td>
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<tr>
<td>Decom. Costs</td>
<td>54,80</td>
<td>82,56</td>
<td>166,18</td>
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<td>Radwaste Costs (2008)</td>
<td>68,70</td>
<td>103,45</td>
<td>44,12</td>
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<tr>
<td>Total</td>
<td>123,50</td>
<td>186,01</td>
<td>210,30</td>
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Far-reaching decon in view of release

Smaller radwaste quantities

End result remains nearly status quo!
Conclusions

- **Belgoprocess has mastered the complex work of decommissioning a reprocessing plant within stringent safety procedures and rules;**

- **During 25 years a lot of knowledge and experience has been acquired in the areas of technology, planning, budget ans human dynamics;**

- **Excellent results were obtained due to an unique applied strategy with emphasis on clearance.**
THANK YOU FOR LISTENING