



Review of a completed Decommissioning Project :

The Eurochemic Reprocessing Plant in Belgium

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Eurochemic

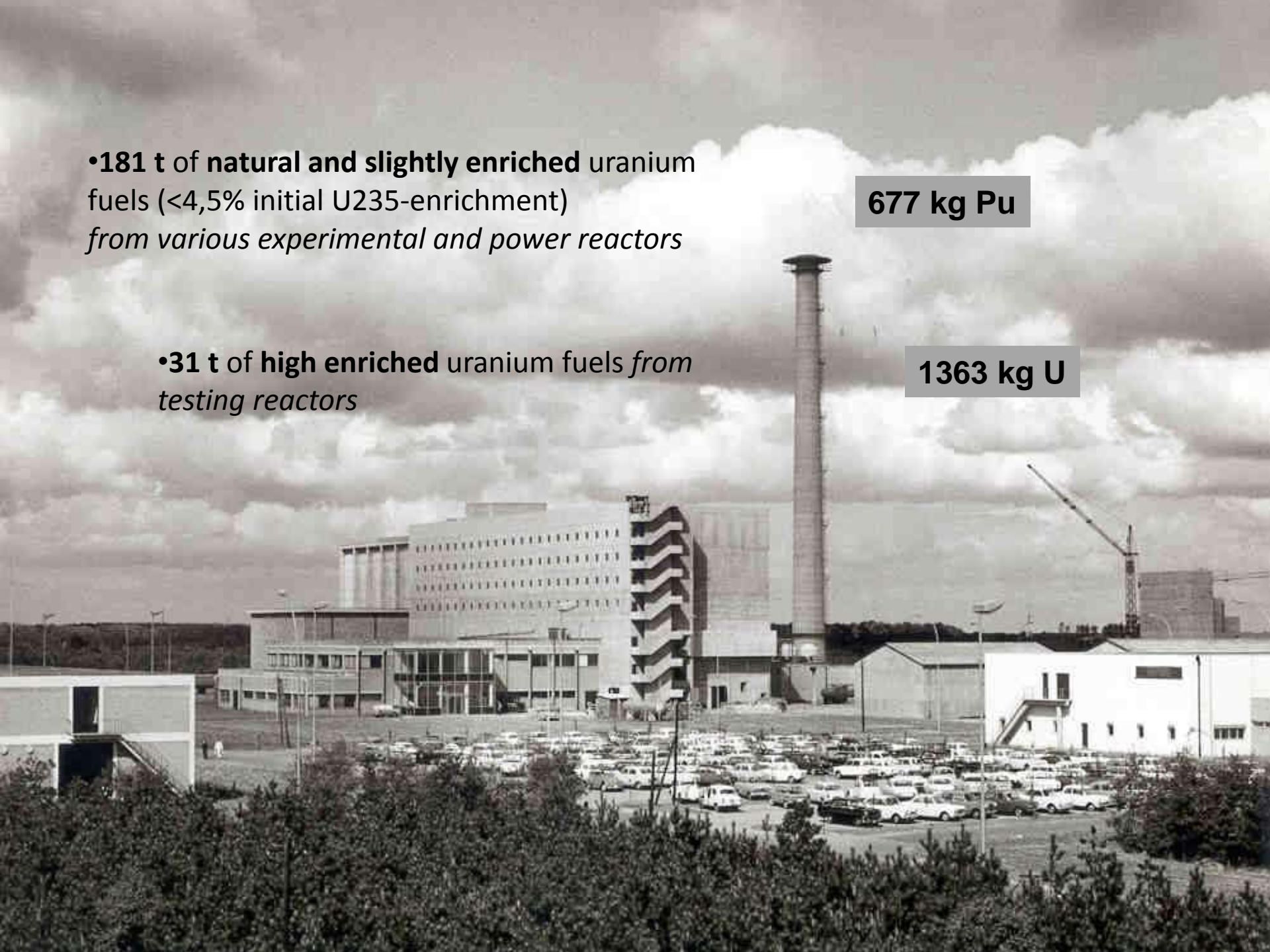


• **181 t of natural and slightly enriched uranium** fuels (<4,5% initial U235-enrichment)
from various experimental and power reactors

677 kg Pu

• **31 t of high enriched uranium** fuels *from testing reactors*

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 alfa and bèta-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

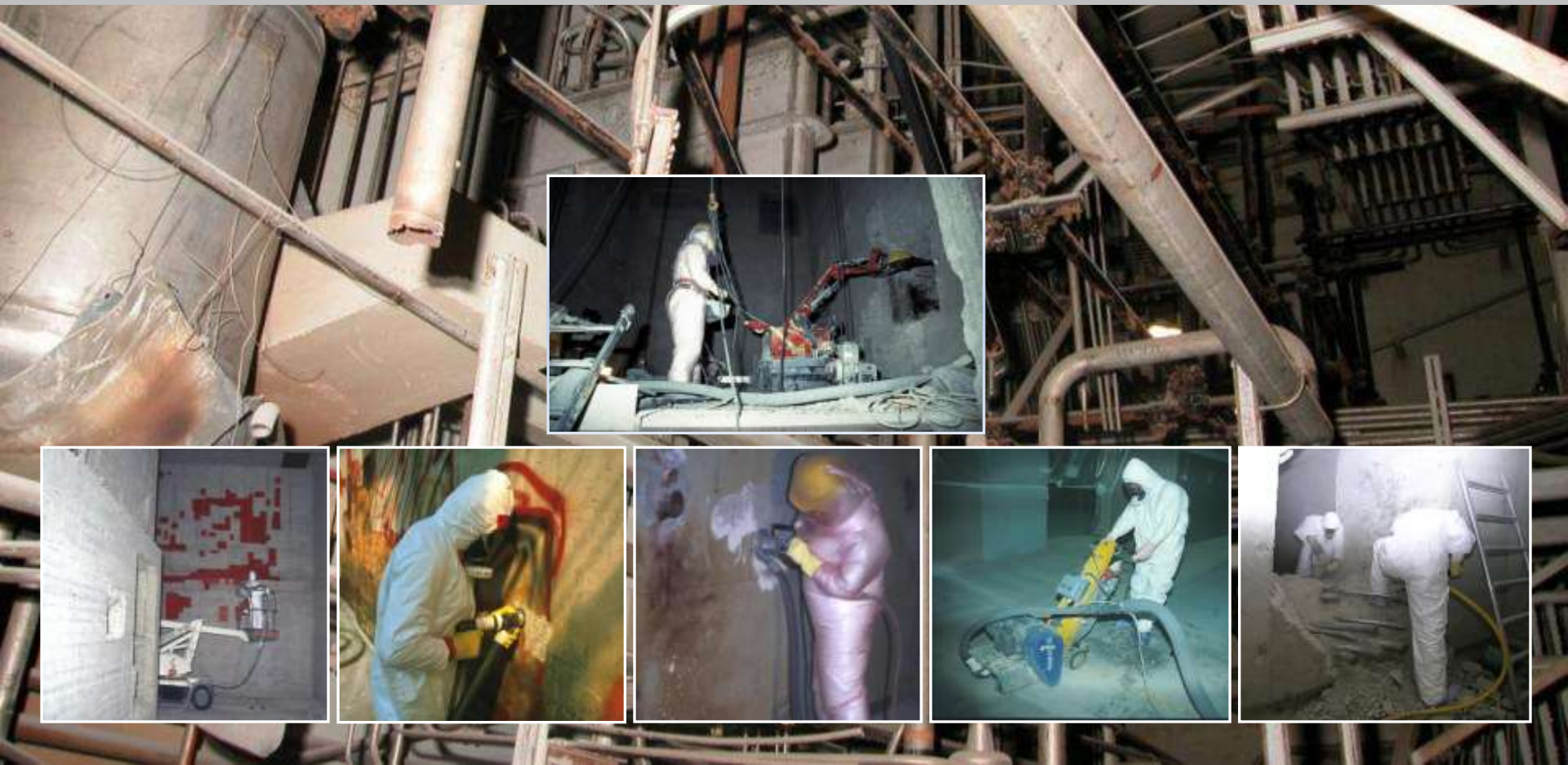
- Avoid any spread of contamination
- Far reaching decontamination in view of unconditional release
- Minimal quantities of radwaste
- Optimization of recycling and exhaust opportunities for reuse of valuable components

Rehabilitation of Eurochemic

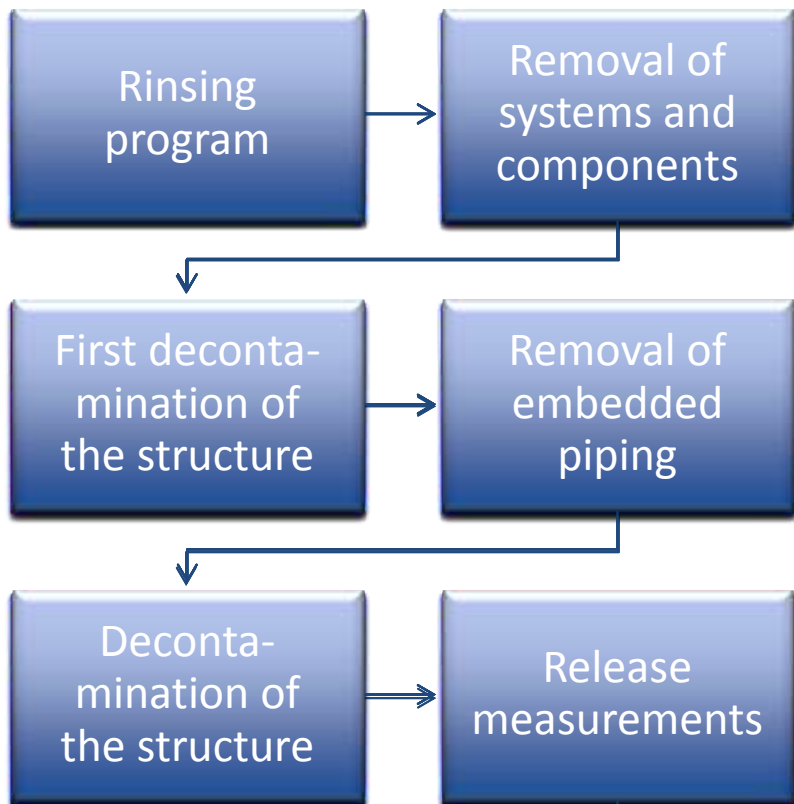
- Relevant data :
 - Length 90 m, width 27 and height 27 m
 - Volume: 56.000 m³
 - Concrete volume : 12.500 m³
 - Concrete surface : 55.000 m²
 - Metal: 1.500 ton
- 7 floors, 40 large cells
- 106 cel structures

Far-reaching decontamination

New technologies, ergonomic tools



Decommissioning strategy



Far-reaching decontamination

METAALSTRAALINSTALLATIE ABRASIVE BLASTING INSTALLATION



1
LAADENHEID VAN DE STRAALINSTALLATIE
CHARGING DEVICE OF THE BLASTING INSTALLATION



3
GESLOTEN STRAALTROMMEL
CLOSED BLASTING CHAMBER



GLOBAAL BEELD VAN DE STRAALINSTALLATIE
OVERVIEW OF THE BLASTING INSTALLATION



5
ONTLADEN VAN DE STRAALTROMMEL
DISCHARGE OF THE BLASTING CHAMBER



2
GEOPENDE STRAALTROMMEL MET TE STRALEN METAAL
OPENED BLASTING CHAMBER WITH METALS TO BE DECONTAMINATED

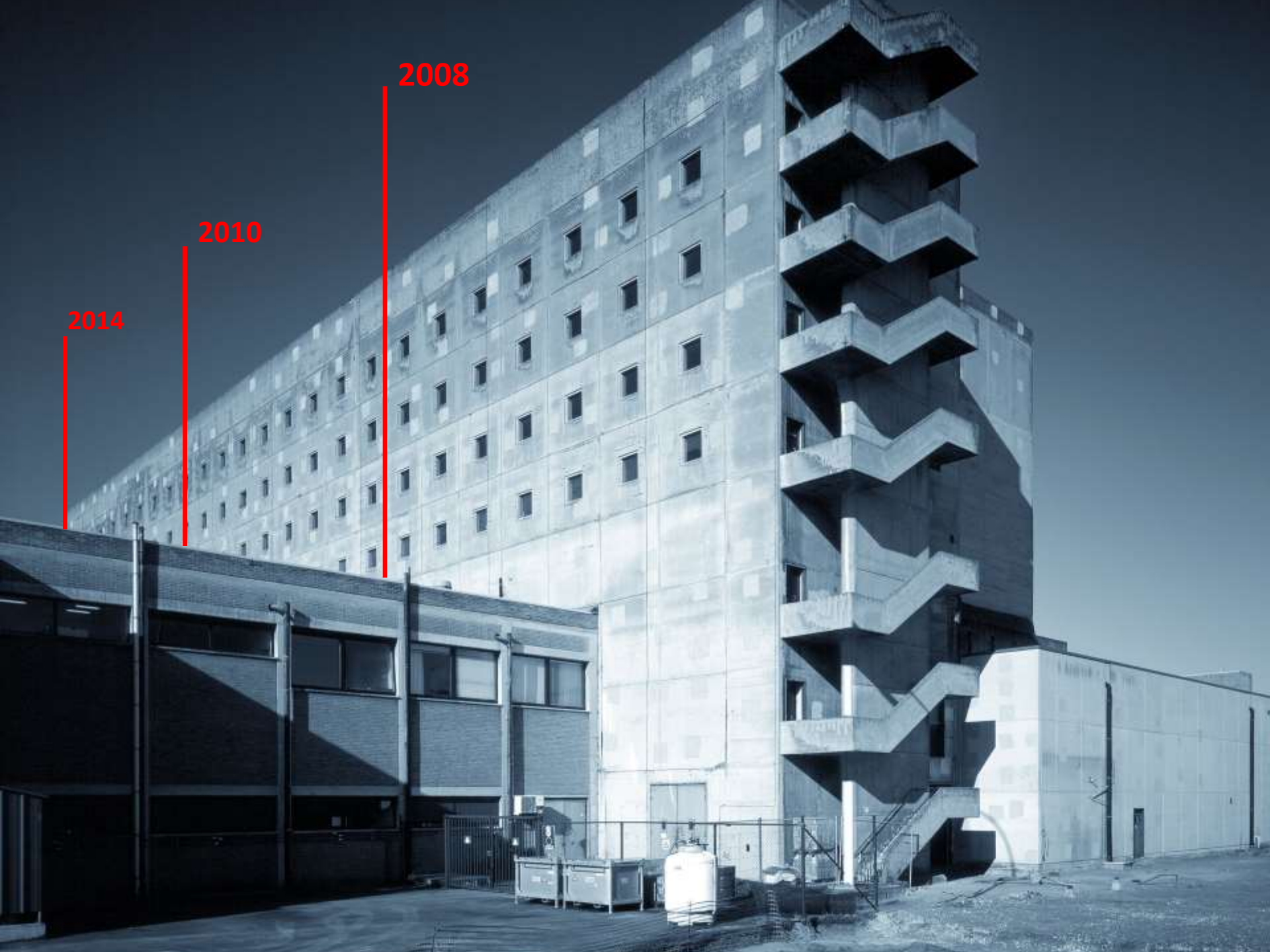


4
BEDIENING VAN DE STRAALINSTALLATIE
OPERATION OF THE BLASTING INSTALLATION



6
GESTRAALD METAAL
BLASTED METAL





2014

2010

2008

Dismantling





Demolition





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

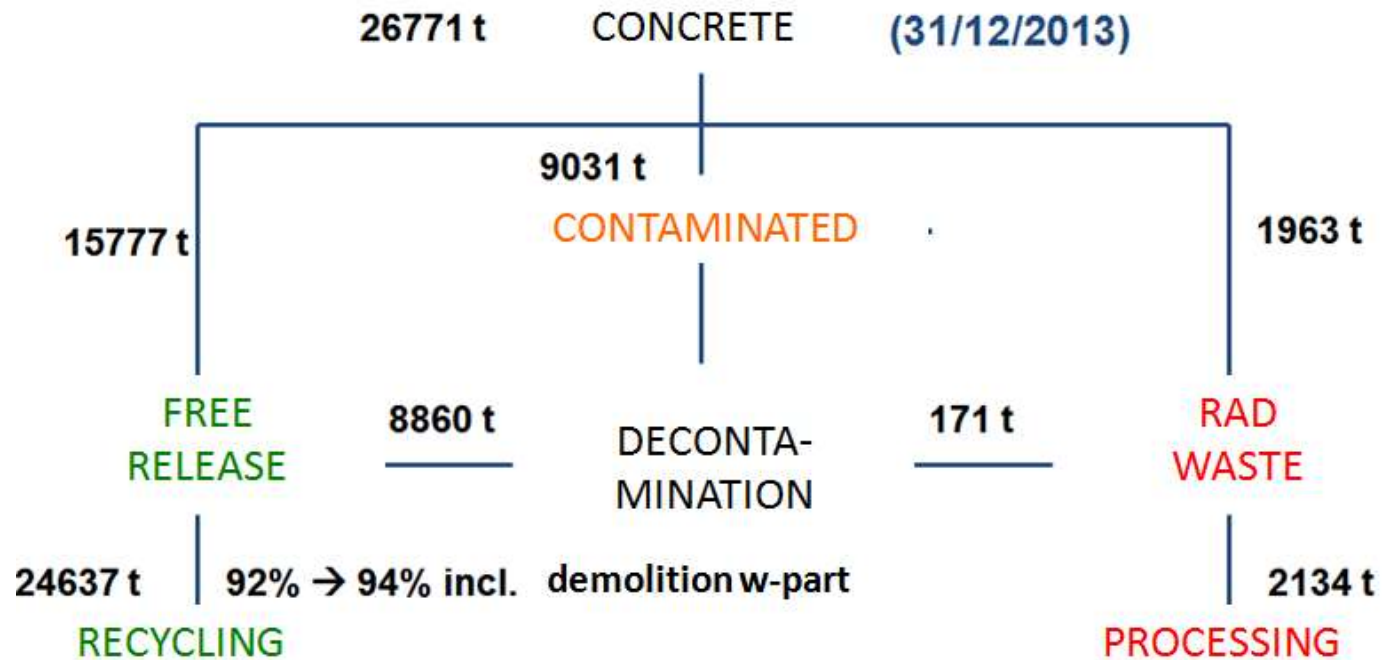


Results

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

Production rates for concrete

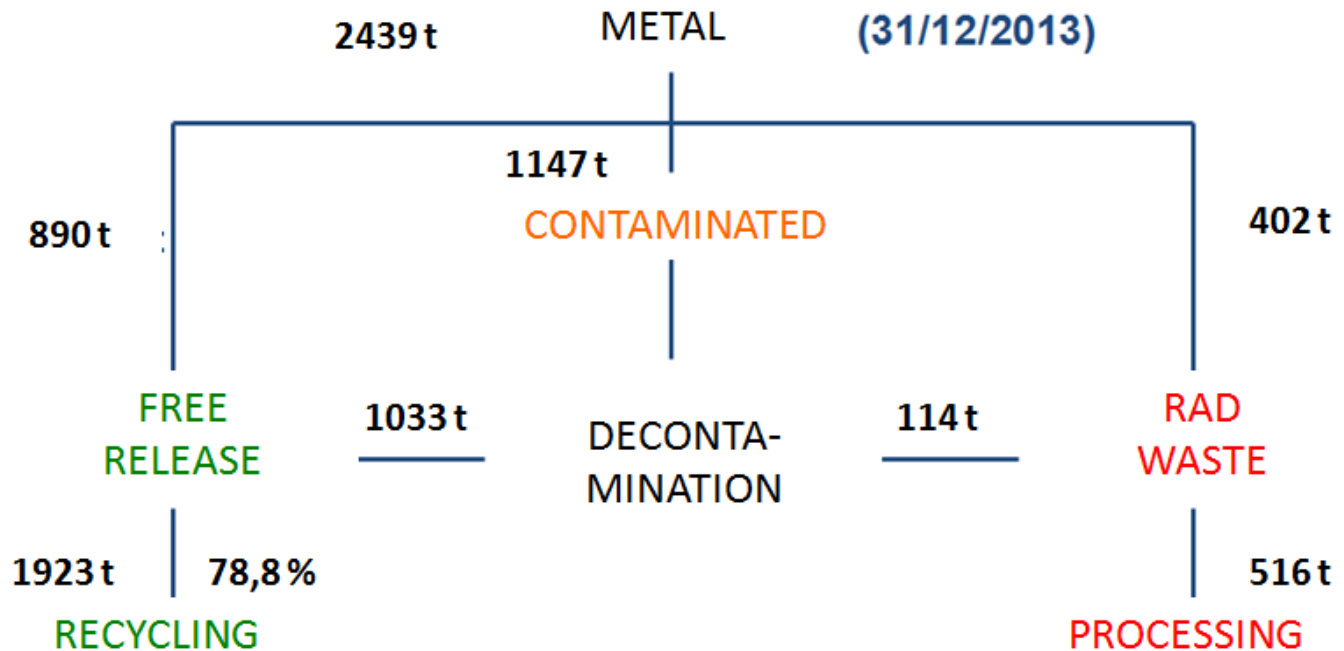
- Demolition included



Production rates for metal



- Demolition included



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

Far-reaching decon in view of release

	Initial estimation		1990 – 2014 M€ ₂₀₁₃	Ratio
	M€ ₁₉₉₂	M€ ₂₀₁₃		
Decom. Costs	54,80	82,56	166,18	2,01
Radwaste Costs (2008)	68,70	103,45	44,12	0,43
Total	123,50	186,01	210,30	1,13

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 and human dynamics;*
- *Excellent results were obtained due to a unique applied strategy with emphasis on clearance.*

THANK YOU FOR LISTENING