



Wir schaffen Wissen – heute für morgen

FIXBOX 3 – WASTE TREATMENT IN A HOT LAB

Heiko Potthast, J. Wichser, M. Kollofrath, D. Gavillet

Nuclear Energy & Safety / Division Hotlabor (AHL)



Introduction

Googling the Term 'fixbox'

100 fixboxes for 35 USD!



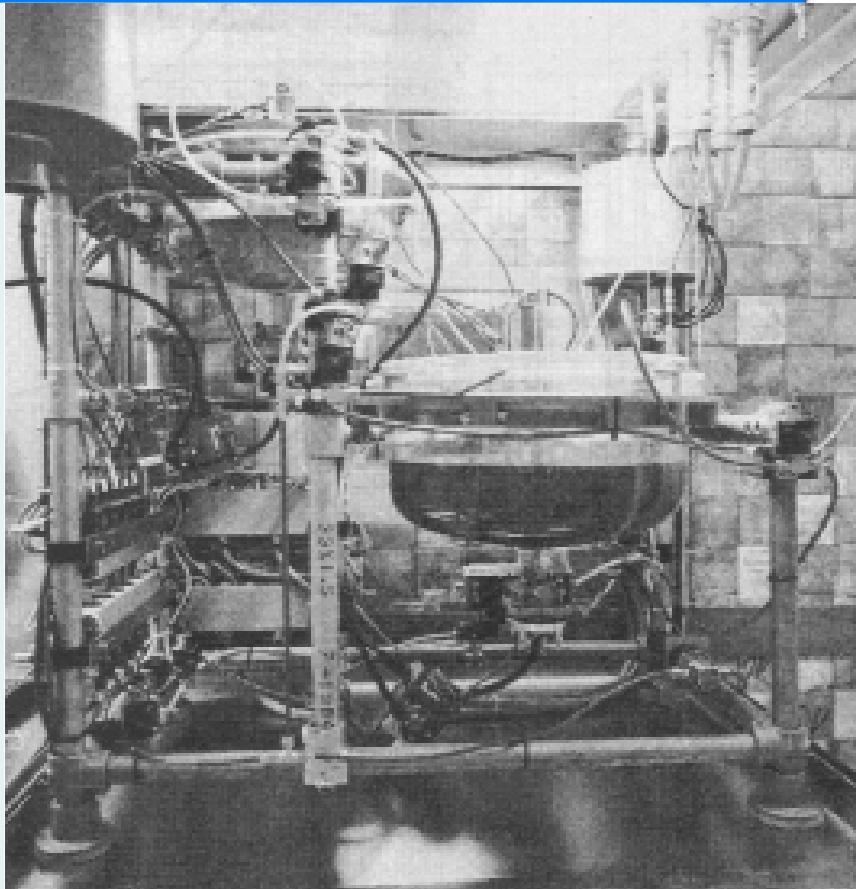
Introduction

The Reality: Fixbox 3 at PSI

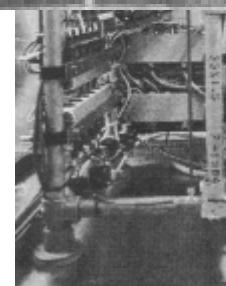


History

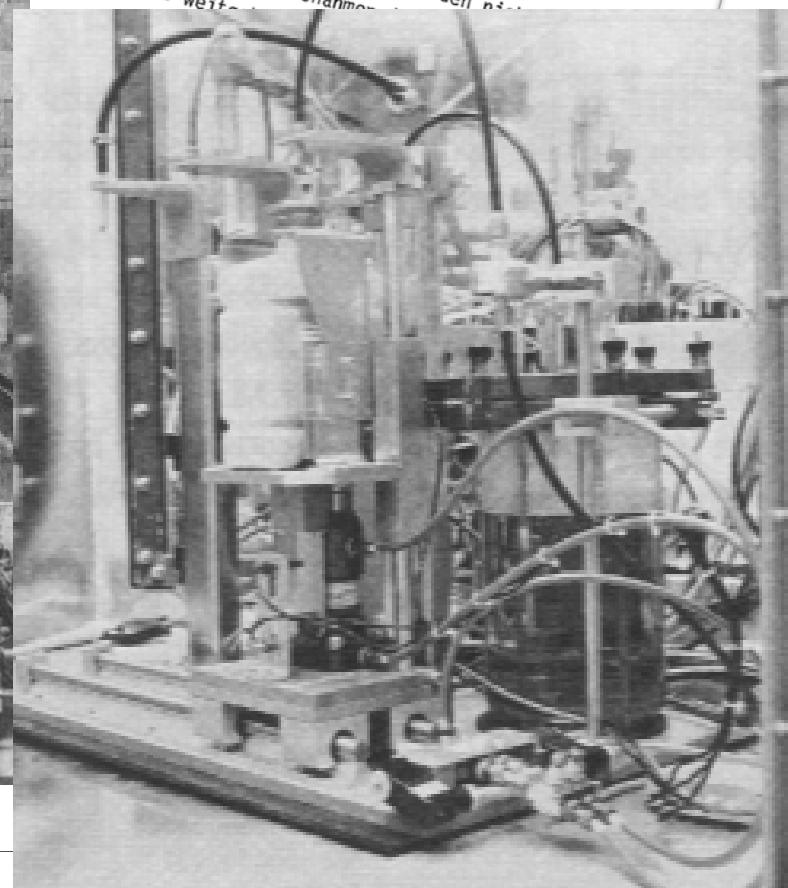
In the Beginning...



44 cement blocks.

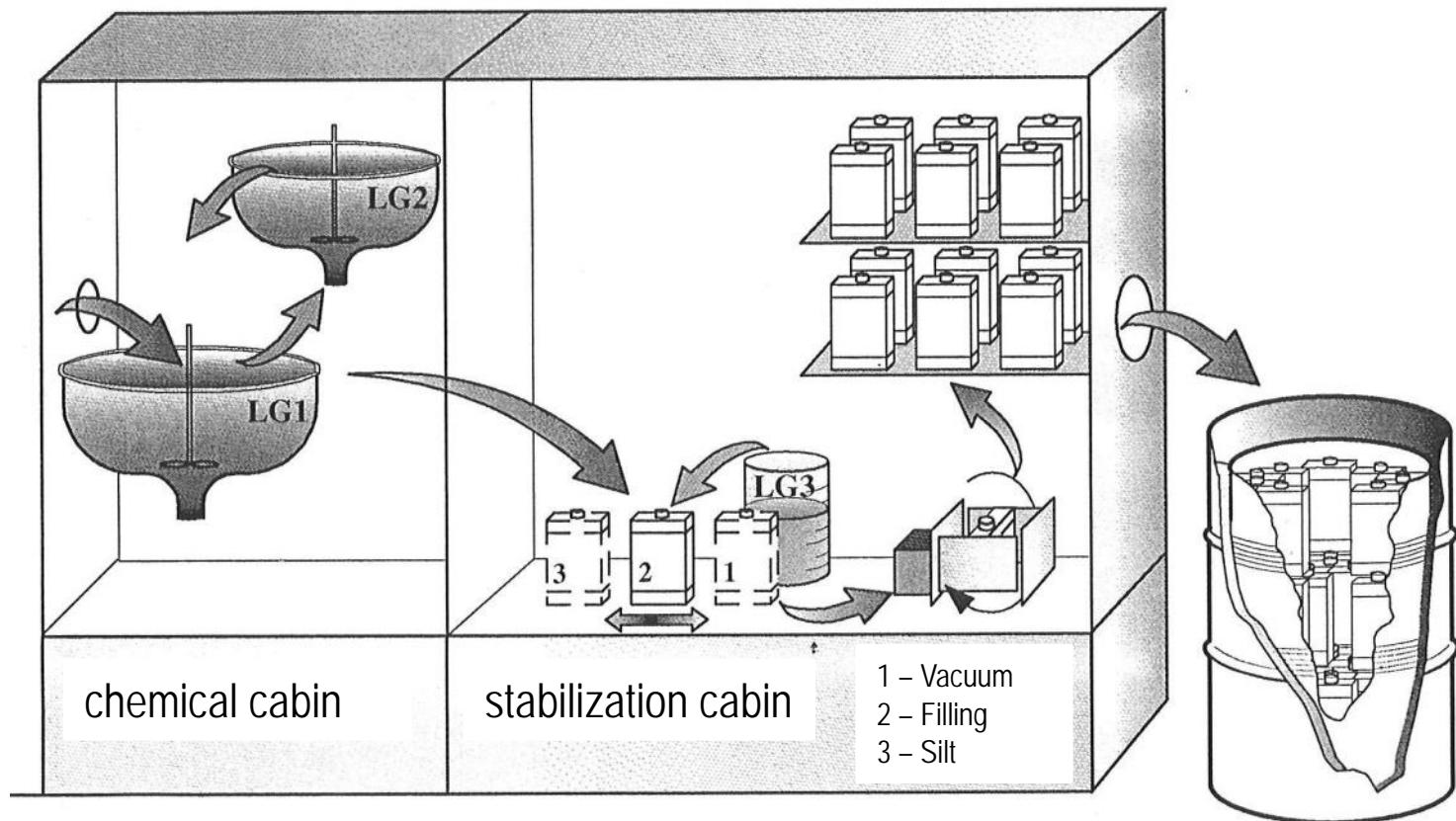


... aus der Brennstoff-Herstellung in der Plutoniumbox Nr. 23 verpuffung, die zur Eröffnung der betroffenen Box und zur Proliferation der Laborräume führte. Durch die beiden betroffenen Laboranten als auch durch die Ueberwachung ausgelöste HL-Notfallalarm funktionierte der Pu-Zone aufhaltenden Personen wurden nicht durch sofortige Schutzmassnahmen aktivem Staub weiter ausgesetzt.



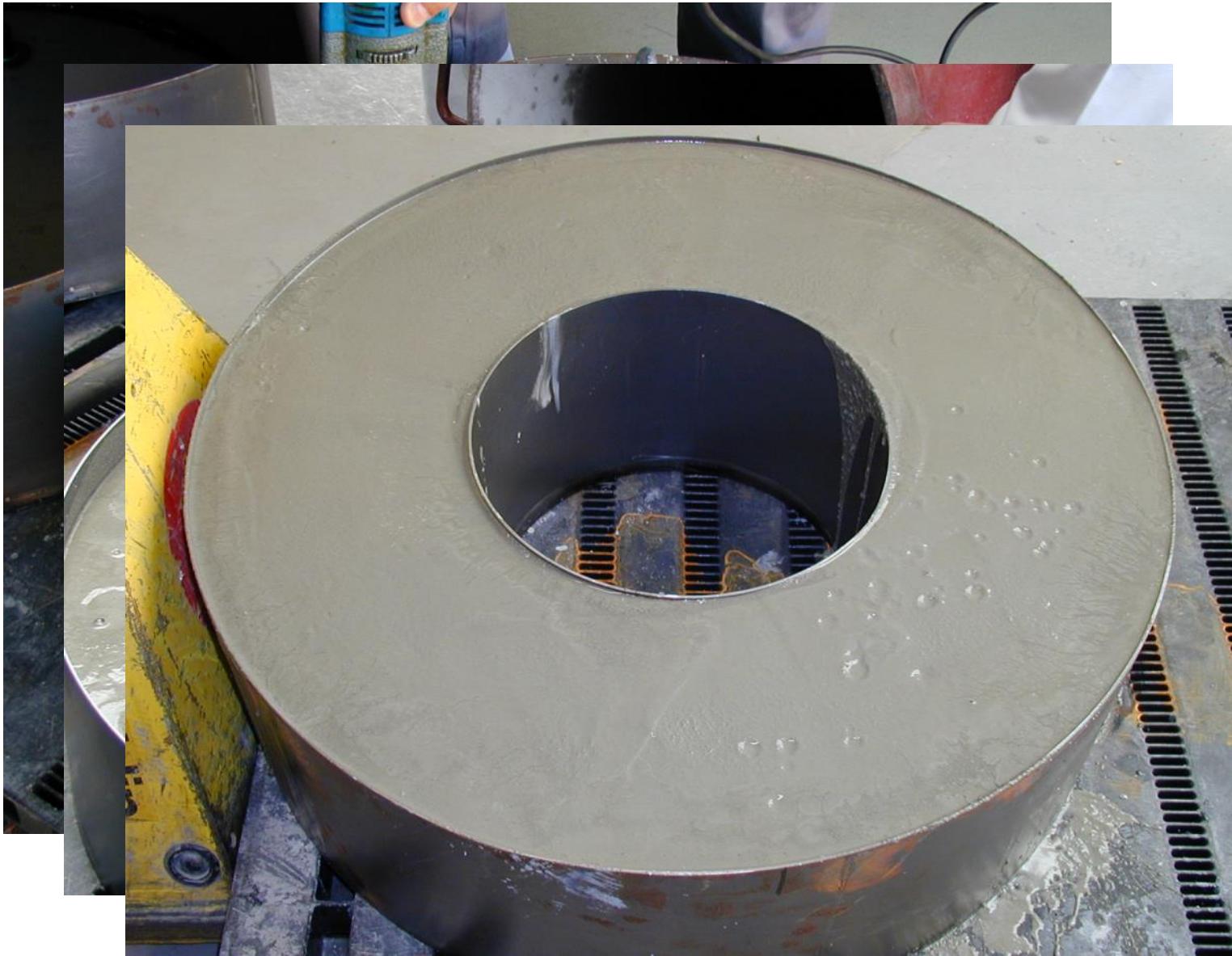
Fixbox 1

Scheme of Fixbox 1



Fixbox 1

Preparing Cement Compounds for Fixbox 1



The Accomplishments of Fixbox 1

Alltogether 64 batches

- ⇒ stabilized approx. 1300 L of radioactive waste solution
- ⇒ produced over 3000 1 L cement compounds

2004/5:

Deconstruction of FIXBOX-1

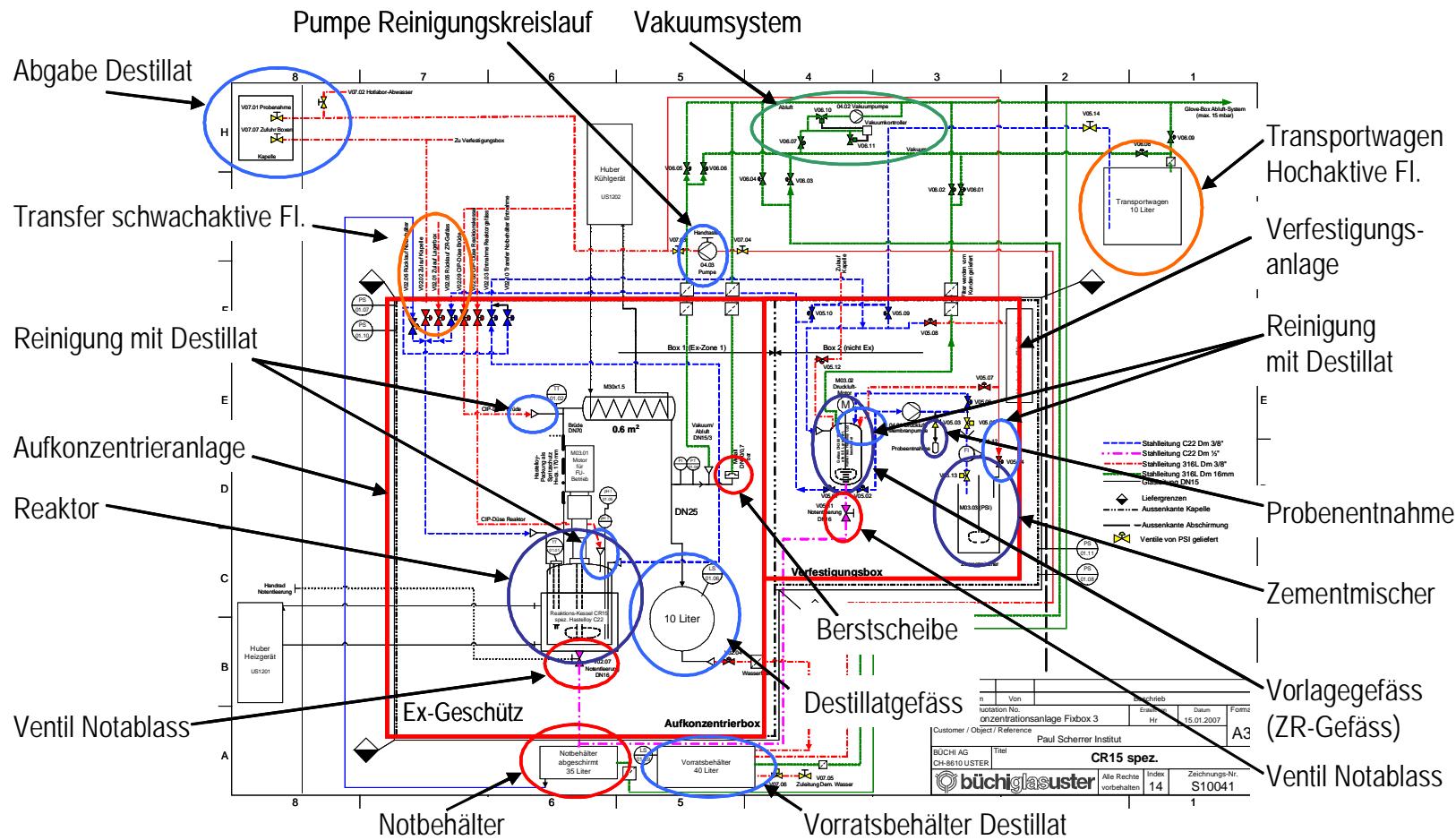
Estimation:

about 40 man weeks
about 1 m³ solid active waste

Improvements

Fixbox 3

... and a bit more complex ...



One step up the evolutionary ladder: Fixbox 3

Planning of Fixbox 3

Started: 2004

Duration: almost 2 years

Goals:

- ⇒ processing of ~600 L existing liquid waste
- ⇒ processing of ~42 L liquid waste generated every year at PSI
- ⇒ Based on the concept of Fixbox 1

~1000 L

~30 L

To Max Out: Concentration Instead of Dilution

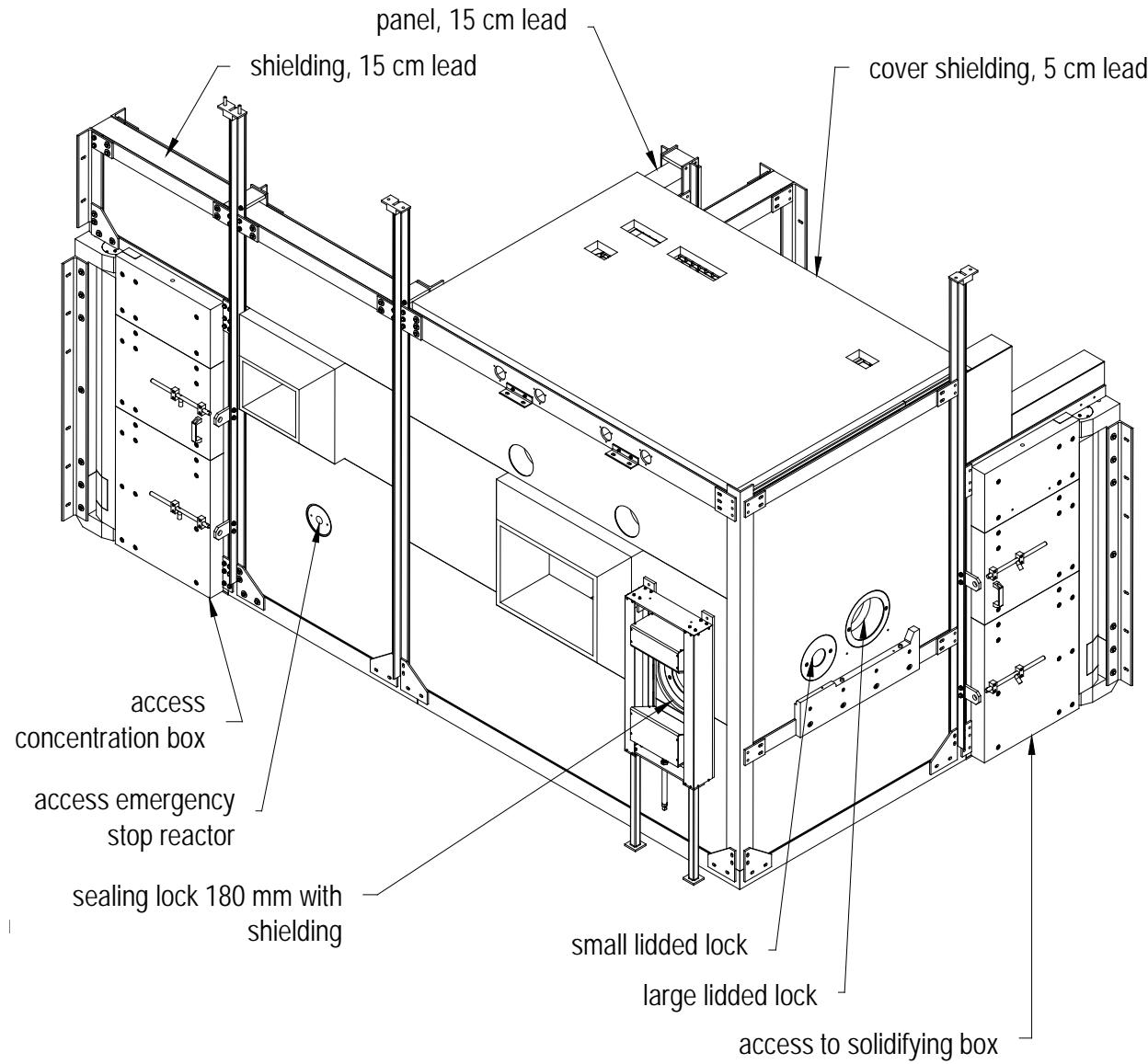
Approach:

- ⇒ concentration increase of liquid waste due to distillation
 - ⇒ exception high active waste which will be diluted
- ⇒ more waste in less volume

Constraints to consider:

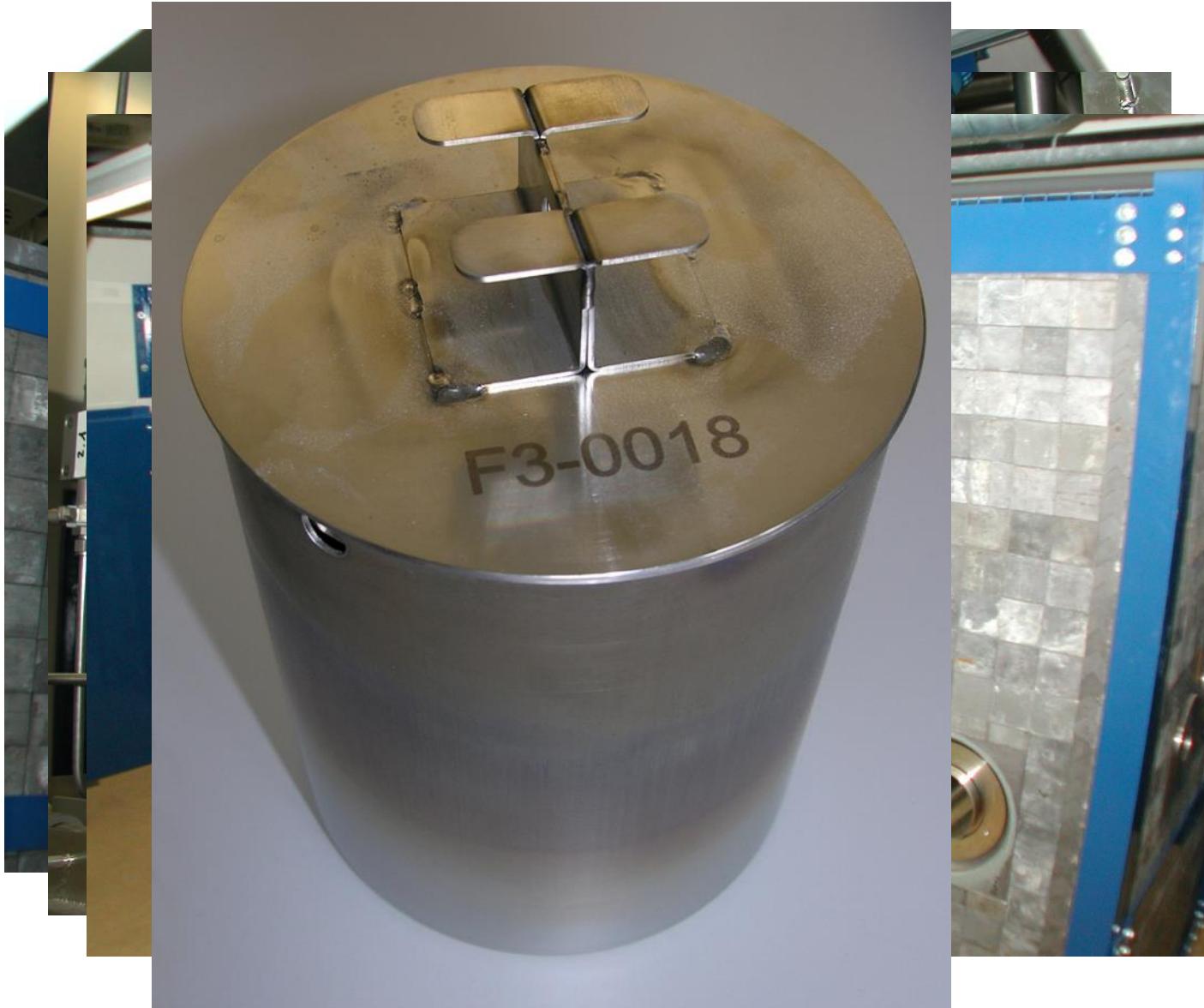
- ⇒ concentration of fission and activation products is limited to 2 mSv/h for final storage
- ⇒ concentration of fissile material is limited to 7 g/L to stay well below criticality
- ⇒ salts in solidifying solutions has to be < 17 %
- ⇒ hydrogen ion concentration as base equivalent < 2 mol/kg

Shielding of Fixbox 3



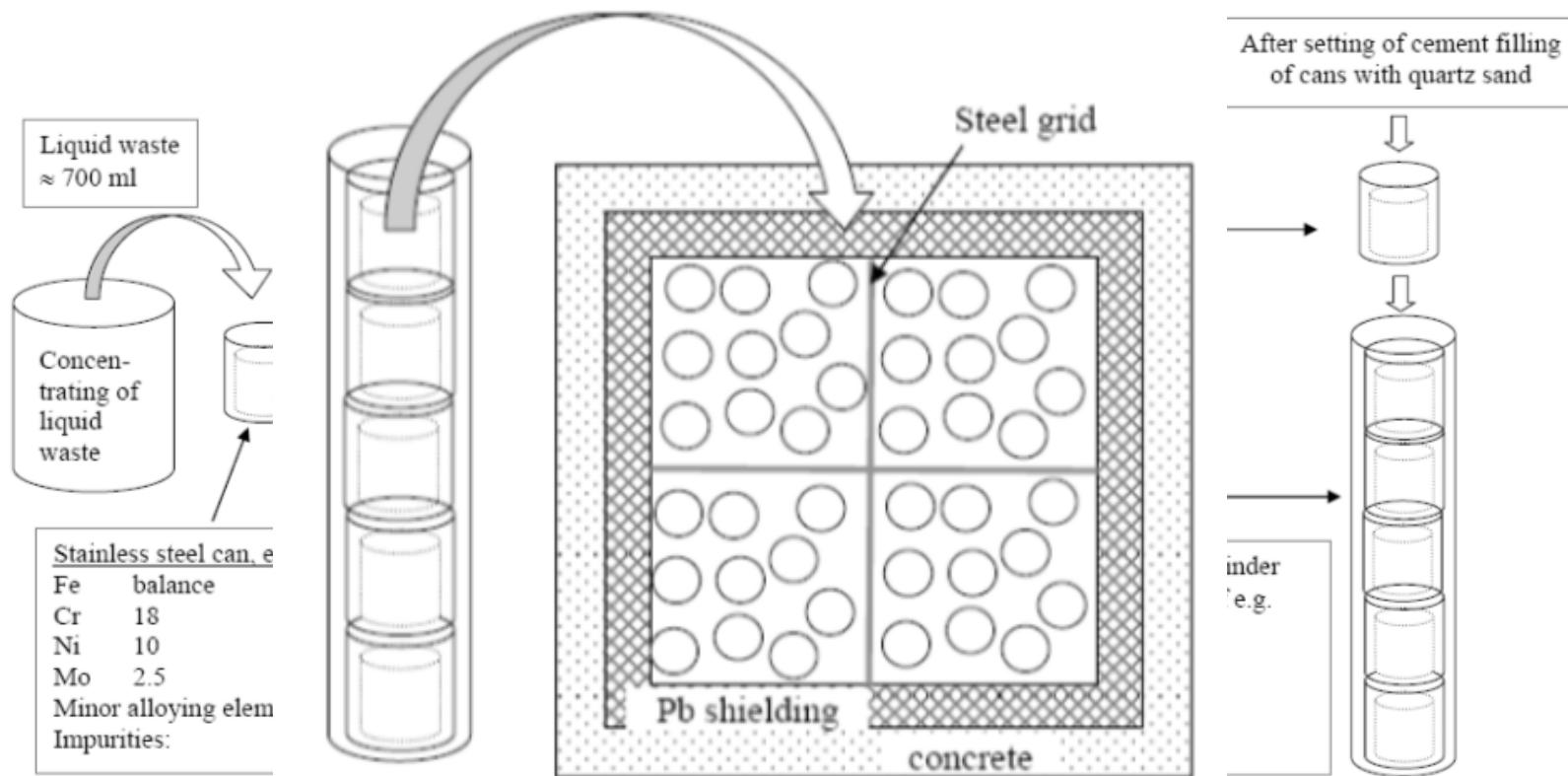
Fixbox 3

Shielding of Fixbox 3



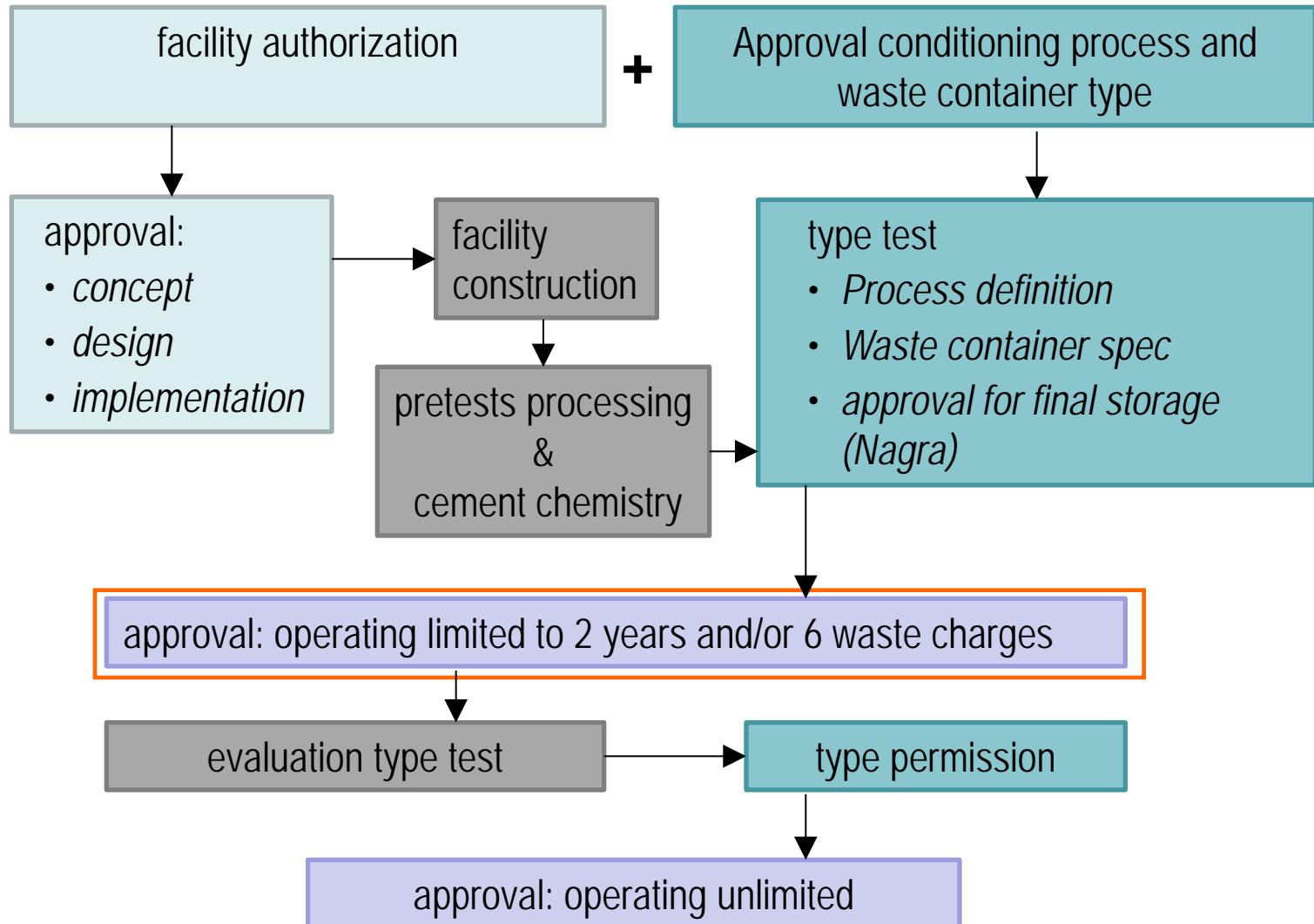
Packing Cement Compounds for Final Storage

Fixbox 3



ENSI – Release Procedure

Fixbox 3



Thank you...
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... for your attention!

