## NON-DESTRUCTIVE DECONTAMINATION OF THE BR2 HOT CELL FACILITY AT SCK/CEN MOL

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#### 0 Introduction

The BR2 hot cell building is adjacent to the BR2 reactor, the building is used for :

- the dismantling of active rigs and experiments ;
- the handling of cobalt used for medical applications ;
- the dimensional control of fuel rods ;
- the assembling of rigs and experiments.

#### **1** Description of the facility

- The laboratory is a vertical construction divided in three levels.
- All levels are build to provide biological shielding ( $\beta$ - $\gamma$ ).
- Wall thickness : 1,3 m concrete.
- The walls are partially plated with stainless steel.

#### 1.1 Dismantling area (level +7,10m)

This area is equipped with :

- 6 master sleeve manipulators ;
- a dismantling machine (milling, drilling, sawing and welding operations);
- a heavy duty manipulator;
- shielded windows ;
- a shielded door;
- a roll crane;
- two filtration units (on each level);
- transport facility to the BR2 storage pool.

#### 1.2 Observation area (level +1,22m)

Equipent :

- 4 master sleeve manipulators ;
- 2 shielded doors ;
- fuel measurement unit ;
- roll crane;
- loading and unloading of containers ;
- shielded windows.

#### 1.3 Storage area (level -1,98m)

Used for the storage (temporarily) of high level waste or fuel pins.

#### 1.4 Container loading area (level -1,98m)

Used for the handling of the shipping casks and the various waste containers.

#### 1.5 Cell back areas

These provided containment when a cell door was opened for introduction of tools or containers.

1.6 Related roomsVentilation rooms.Maintenance area for master sleeve manipulators.Mechanical workshop.Decontamination room.

### 2 State of the facility after the contamination

A  $^{60}$ Co-source containing small metal grains and powder ruptured inside the hot cell.

Co-particles were dispersed in the building.

The resulting contamination has given rise to radiation levels which are too high to permit human entry.

Background measurement on level

+ 7,10m --> 350 mSv/h

+ 1,22m --> 350 mSv/h

- 1,98m --> 100 mSv/h

#### **3** Decontamination objectives

Objectives

to evaluate the kind of contamination;

to recover and remove the grains;

to remove the powder;

to reduce the radiation levels to permit human entry on each level.

#### 4 Achievements

Achievements

Determination of a decontamination strategy.

Development of inspection and decontamination equipment.

Selection of cleaning products compatible with the cell infrastructure and also accepted by e liquid waste treatment plant.

Description of safety and operation procedures.

Clearance for entrance for maintenance operations in the building.

Reduction of the background of the highest compartment from 350 mSv.h<sup>-1</sup> to 1 mS.h<sup>-1</sup>.

#### 5 Accumulated dose

Over a period of three years the eight workmen did not exceed the limit of 10mSv/52weeks.

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# Background +7,10 m east



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21-03-91	mSv/h
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22-05-91	350
26-07-91	180
02-09-91	30
30-09-91	200
13-01-92	60
15-01-92	12
16-01-92	20
17-01-92	50
20-08-92	35
31-08-92	25
01-09-92	25
03-09-92	17
15-10-92	15
16-10-92	13
30-10-92	14
09-11-92	13
18-11-92	25
24-11-92	15
25-11-92	17
26-11-92	15
27-11-92	15
30-11-92	55
02-12-92	9,5
03-12-92	8,2
04-12-92	12
07-12-92	7,5
09-12-92	9
10-12-92	3,5
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