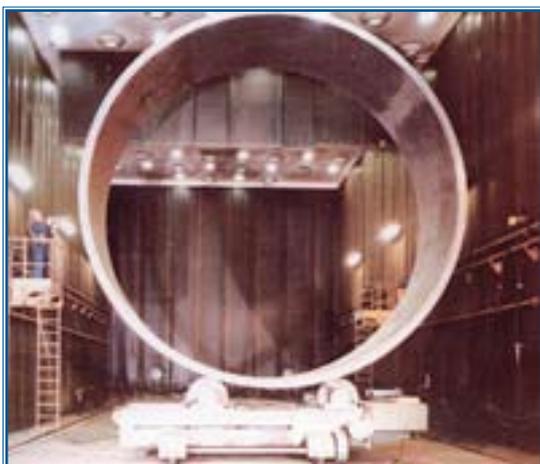




#### Compressed air activation

##### Application sectors

01.00	Carpentry, boiler builders, Shipbuilding	<input checked="" type="checkbox"/>
02.00	Rail industry, Production & maintenance	<input checked="" type="checkbox"/>
03.00	Foundry, Steel industry Mining and Oil industry	<input type="checkbox"/>
04.00	Inox manufacturing and furnishing	<input checked="" type="checkbox"/>
05.00	Aviation industry	<input checked="" type="checkbox"/>
06.00	Termal treatment, Filling steel, Mechanics	<input checked="" type="checkbox"/>
07.00	Car industry and Motoring industry	<input checked="" type="checkbox"/>
08.00	Internal and external pipes and cilinders sandblasting	<input type="checkbox"/>
09.00	Plastic, Rubber, Galvanic	<input checked="" type="checkbox"/>
10.00	Painting company and plants	<input checked="" type="checkbox"/>
11.00	Glass industry	<input type="checkbox"/>
12.00	Building and road construction	<input checked="" type="checkbox"/>
13.00	Nuclear energy	<input checked="" type="checkbox"/>
14.00	Armament industry	<input checked="" type="checkbox"/>
15.00	Electromechanics and Electronics	<input type="checkbox"/>



Free jet room

##### Specification



Picture of the decontamination cell

The principle of the **DRY DECONTAMINATION SYSTEM (D.D.S.)**

cell, comes from a pneumatic blasting closed circuit system.

The transformation of the blasting system in decontamination cell has necessitated the adoption of specific techniques and tricks. It is now accepted by the authorities of work safety in the nuclear industry.

#### DECONTAMINATION

The decontamination action is performed with the launch of inert material (AL2 corundum 03) against the surface of the contaminated workpiece. The force of the impact of the abrasive is able to remove the oxide surface layer where the radioactive contaminated items are incorporated. The complete removal of the oxidized layer ensures the removal operation of the contaminated surface, while the size of the abrasive, the impact angle, casting distance, etc., ensure that the piece will not be affected but only the surface oxidation be removed.

The crushed contaminated oxide and abrasive are separated and collected in special "rotary valve" that can then be sent to the "nuclear waste".



## General information

### PRINCIPLE OF OPERATION

The decontamination cell consists of a room in which the pieces are introduced to be decontaminated.

The operator manually activates a jet of abrasive (aluminum oxide) that is directed against the surface to be decontaminated. The impact of the abrasive action removes the polluted oxide surface in few seconds. The operator shall direct the jet to clean the entire surface of the piece.

Oxide removed from the surface and abrasive are dragged to the floor by a vertical air flow that enters from the roof from and exits to the floor.

The floor, DELTA FLOOR, shall be constructed so that dust and abrasive are collected in special hoppers and then are conveyed in a pneumatic circuit of separation and recirculation.

From the floor, the abrasive and dust are transported to a recovery generator. The dust and the crushed abrasive are separated and transferred to the exhaust rotary valve. The constant grain size abrasive is transferred to the recovery hopper, then in the pressure hopper, and then launched again through the nozzle against the workpiece to be decontaminated.

The cycle is a closed circuit in which is always conveyed the same abrasive. Only the crushed abrasive, which is discarded with the contaminated dust, must be replaced from time to time to restore the original amount.

The air works as a vehicle to transport the abrasive is drawn by a single fan located downstream of the entire circuit. After separating the dust and the crushed abrasive, the air passes through a primary filter cartridge, which stops the dust, and then through a battery of HEPA filters and active carbon filters before being injected into the exhaust pipe of the plant. At the end of a decontamination operation, all the contaminated dust and the crushed abrasive are collected in the rotary valve located under the main filter and ready to be discharged.

### PRODUCTION DESIGN

The decontamination cell is the main element. It is located within the central side of the wheel.

The contaminated items are placed in the chamber in different ways depending on their characteristics (size, shape, size).

The cell is designed to have a open roof for easy access from the rotors of the wheel.

In one operation the crane lifts the rotor from the wheel supports and places it on the bearings (external) of the cell decontamination. The shaft slots are sealed, on the cell walls, the roof is closed and the operation of decontamination starts. The duration of the decontamination depends on the surface of the workpiece and the operator's ability.

When the cycle is finished, the roof is opened again, the shaft slots are freed and the crane is able to take the decontaminated rotor from the cell supports and place it on the wheel supports.

With only two movements, the rotor is ready for decontamination.

For other pieces, such as pipes, flanges, profiles, frames, bodies of water pumps and other contaminated pieces of metal or plastic, it was decided to realize a opening door on the front wall through which pieces of any shape can be easily introduced into.

The operator, before entering the cell, passes into a hall where he wears a special protective suit. The operational surface consists of a platform for the rotors, which is then folded against the wall.

For all other pieces the operational surface is the floor of the cell.

All other components of the system are distributed around the cell in a compact place that ensures a small space occupation.





The main components are:

- a) compressor capable of generating compressed air at 8 bar
- b) abrasive suction channels
- c) recovery generator
- d) the primary filter with dry cartridge
- e) HEPA filter
- f) the main vacuum

All containment parts are vacuum. So, in addition to the main suction circuit, there is an aspiration circuit in of the rotary valve room and below the recovery generator room. These circuits ensure that during the removal of contaminated dust, may not spread inside and so well during the possible removal of abrasive from the generator, it doesn't spread outside.

### ADVANTAGES

The advantages of a dry decontamination system are already well known to all nuclear power plants employees, especially in terms of time and effectiveness.

Our D.D.S. made possible to adopt the dry system for all metal components and makes the operation possible inside the plant. There is no special equipment needed for transportation and handling. It minimize the time required for decontamination (in terms of minutes per square meter.). A single system for all types of contamination oxide based on surfaces of any metal (steel, stainless steel, brass, copper, etc.). The volume and weight of residual contaminated material is easy to collect and discard in specific ways and places . The use of D.D.S. is very easy after a proper training to the staff. Maintenance is reduced almost exclusively to the damage caused by wear during the exercise. It's enough just a preventive maintenance program to ensure continuous availability of the plant.

### PNEUMATIC OPERATING ROOM WITHOUT PIT - DELTA FLOOR

Pneumatic recovery of the abrasive technology through the small hoppers floor, passing the concentrator, the recovery/ separator, cyclone and pressure generator.

The air intake is through the same circuit because the air itself is the vehicle to transport the abrasive to the the recovery/ separator and then suction ensures that the dust is dragged on the filter cartridges.

The floor is composed of many small hoppers in amounts proportional to the surface of the floor.

The abrasive falls under gravity on the floor, in the small hoppers.

The air is intaken through the roof holes of the room and conveyed vertically downward.

The airflow, through the small hoppers, raises the abrasive, runs through the cross pipes and carries it in the concentrator.

The abrasive is separated from the lighter parts and the air with the dust goes to the filters. The abrasive, separated at the bottom of the concentrator, is then inhaled in the current recovery by another flow, come in a cyclone from the crushed abrasive and dust is separated from the abrasive, sieved from large parts and stored in the recovery hopper.

From the recovery hopper then passes into the pressure hopper, ready to be re-launched through the nozzle.

The air circulation from top to bottom has a large effect on dust removal and produces an excellent visibility. If the installation of binaries is needed, they are supported on sturdy rails welded on the small hoppers and resting on a cement floor.





## IMPORTANT

With this camera you can use, in addition to light abrasive such as aluminum oxide (corundum) or glass beads, even ferrous abrasive below a certain size.

## OUTLINE DIAGRAM SHOWING THE AIR ABRASIVE CIRCUIT

The shot blasting room DELTA FLOOR is adopting a fully pneumatic system to provide inside ventilation, the abrasive recovery and reclaiming.

The ventilation air, entering through roof openings equipped with air filter and baffles, falls down across the room: through the many little hoppers in the floor (DELTA FLOOR) the air carries the abrasive, dust, debris.

In the heavy abrasive model they are transferred into the Concentrator where the abrasive falls down, and it is than recovered, while the dust is transferred into the dust collector. In the light abrasive model the floor is directly connected to the reclaimer, fitted on top of the generator, therefore the concentrator is not required.

## DELTA FLOOR CROSS ACTION

The DELTA FLOOR is entirely made of small hoppers, normally one square foot, covered with perforated steel sheet. The empty space underneath the hoppers are arranged as air ducts through which the abrasive, dust and debris are transferred into the concentrator.

The depth of the small hoppers and the air ducts are usually about 7 inches, therefore all the room can be laid down on the floor without need of foundation. When

it is necessary for transport reasons to have the DELTA FLOOR at the same level of the workshop floor, than will be required a 7 inches deep platform recess on the workshop floor.



Picture of the decontamination cell

