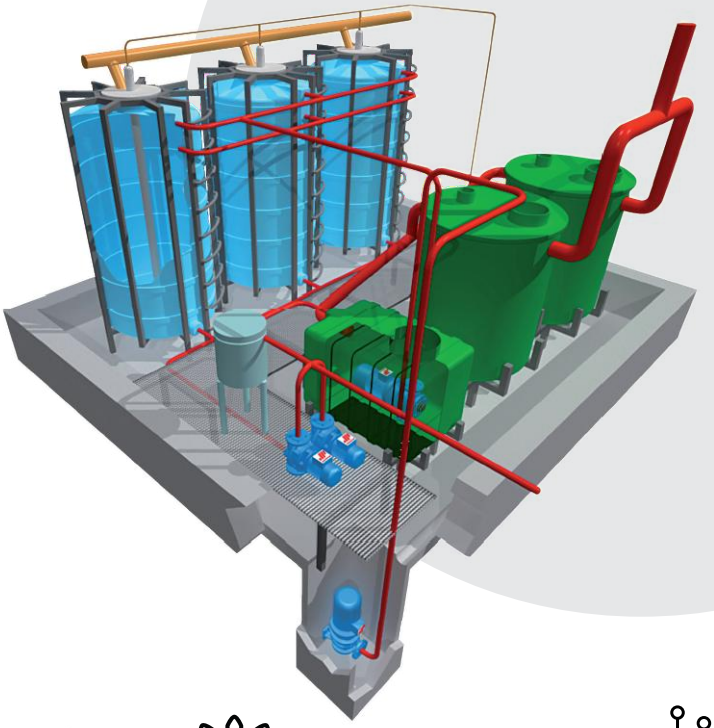
WDMS NT-VK

MONITORING AND DISPOSAL SYSTEM FOR RADIOACTIVE WASTEWATERS



Redundant level sensors and pumps

Automatic system managed by remote PC

Fully customizable system

- 1 liter Marinelli beaker measurement geometry
- 2″x2″ NaI(Tl) scintillator with MCA
- Lead shielding well
- Release pumps
- Safety devices against flooding
- Local PLC and remote PC with management software

The **WDMS NT-VK** system is designed to collect and monitor radioactive wastewaters, which can be released only after their radioactivity drops below a defined value. The main application of such a system is related to diagnostic and therapeutic procedures involving radioactive substances, and their partial elimination through the patient's metabolism.

The **WDMS NT-VK** main components are:

- Purification group: Imhoff tanks designed to collect the wastewaters and to separate liquid from solid waste
- Sorting group: pumps and conduits pouring the wastewaters in the decay tanks
- Decay group: tanks array where the wastewaters are poured and stocked until their radioactive level drops below a defined value
- Sampling system: valves and pumps used by the system to wash the sampling circuit and to sample the stocked wastewaters, allowing the measurement in Marinelli geometry
- Release group: pumps and conduits releasing the wastewaters in the sewers, if allowed by the monitoring results
- Safety groups and devices: level and pump sensors installed in all the system critical stages, stopping the wastewaters flow in case of detected anomaly, and safety flooding well which can collect and stock wastewaters potentially overflowing from any system group

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The entire system is locally managed by a PLC, which is commanded by a remote management software installed on a PC.
Through the interactive synoptic interface of the software the operator can activate the system automatic cycles, set the measurement parameters, visualize the alarms and release archives, and monitor the system's status (filling levels, pump stages, measurements, alarms). Depending on the measurement results, and as defined by the procedures in force, the operator can also activate the monitored wastewaters release in the sewers.

TECHNICAL SPECIFICATIONS

System layout

Some components of the system, mainly the number and the type of the decay tanks, can be defined according to specific installation requirements; however, the main groups and the functioning logic are essentially the same.

Radiological monitoring specification

- Detector: 2"x2" NaI(Tl) scintillator with MCA
- 1 liter Marinelli beaker including connections to the system
- Lead well: 5 cm thickness

Marinelli geometry measuremet chamber inside lead well

SAFETY DEVICES

Redundant critical elements

The elements of the hydraulic system managing the flow of the wastewaters (pumps, purification tanks, etc.) are designed to minimise the risks of overflowing due to any malfunctioning, and to guarantee the operational functioning of the system also during maintenance procedures.
In particular, the critical elements are redundant: if the first Imhoff tank gets clogged, or if it needs maintenance, the second tank allows to continue the normal operations without risks or interruptions. This redundancy is applied also to the sorting pumps, which works alternatively even in normal functioning, to minimize their wear.

Containment group

A perimetral waterproof containment barrier is built on the floor, to contain wastewaters potentially flooding from any system stage and to convoy them to a safety flooding well; from here, under the operator's command, the wastewaters can be poured back in the sorting group through a dedicated pump.

Level sensors

These devices indicate to the operator the progressive filling of the decay tanks, the sorting group and the safety flooding well.

WDMS NT-VK example (decay tanks and PLC board)

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