

RESYS DECAY TANK CONTROL SYSTEM



MAIN ADVANTAGES

- Safe system for capturing liquid radioactive waste
- The solution minimizes the permanent settling of sludge at the bottom of the tanks
- Monitoring the activity of individual radionuclides in liquid waste
- Ensuring that the release levels of individual radionuclides are not exceeded when discharging wastewater into the environment
- Optional full automation of release of liquid waste into the sewerage
- Optimization of the retention tank system according to the specific needs of the customer
- Storing data on drained tanks and waste to the RESYS system database
- Printing of protocols and reports on drained tanks and waste
- Control of technology from a PC after logging in to an RESYS system by an authorized user
- Service mode allows authorized users to control individual components of retention tanks, such as valves, pumps, etc.
- Possibility to control the system from a remote PC connected to the LAN
- Sending messages to the system administrator via e-mail or optionally SMS

PURPOSE

The system of retention tanks is installed at the outlet of the gravity or vacuum sewer and is designed for:

- collection of radioactive wastewater in tanks,
- their detention until their activity has fallen below the legal release level by radioactive decay
- drain into the sewer, including records of balances of activities of released radioisotopes.

The system ensures monitoring of radioactive liquid waste and non-exceedance of free release levels for individual radioisotopes when draining wastewater from a workplace that works with liquid RAW.

The system is designed especially for diagnostic (PET, SPECT centres) and oncological workplaces of nuclear medicine, using radionuclides with a relatively short half-life such as ^{131}I , $^{99\text{m}}\text{Tc}$, ^{18}F , ^{177}Lu , ^{68}Ga , ^{153}Sm , etc.

The basis of the VF solution is one or more tanks in which wastewater is collected. The standard tank consists mainly of:

- stainless steel or plastic tanks for liquid waste collection;
- level sensors to determine the volume of waste in the tank;
- MAK-201 scintillation detector for spectrometric measurement of the activity of up to four selected radionuclides;
- pumps and valves for liquid waste handling.

TYPES

The retention tank system usually comprises two tanks: the standard and the emergency tank. Optionally, it can comprise just one standard tank or several tanks of the following types:

Standard tank

is the basic type of tank that virtually all installations have. The liquid collects in it and subsequently the radioactive waste dies out in it. Subsequently, the waste can be drained from it or transferred to another tank.

Pumping tank

is intended for the case when the liquid waste at the inlet to the system will be filled through the pumping tank mainly due to:

- installation of vacuum sewerages;
- retention tanks are installed above the level of the sewerage outlet.

The waste is then continuously pumped into a standard tank.

Drain tank

is designed for the case where liquid waste will be released into the environment from this tank due to cost savings for verification of the activity meter.

From the standard tank, the waste is then pumped out after completion of retention into the discharge tank, which after the measurement will allow the waste to be released into the environment.

Outpumping tank

is intended for the case when the released liquid waste will be drained from this tank, especially due to the fact that the system of retention tanks is installed below the level of the waste outlet from the building. Waste from it is continuously pumped into the sewerage.

Separate tank

it is installed as a completely separate, the waste from it flows directly into the environment, it cannot be transferred to another tank. The user must set the operating mode of the workplace so that no new radioactive waste flows into the tank during the retention period.

Emergency tank

One or more emergency sumps are located below the retention tanks in the event of an accident.

WASTE RELEASE

The release level can be set for:

- limited volume activity of isotopes in the tank,
- limited total isotope activity released during a given period (e.g. month),
- combination of both of the above limits.

The user can choose whether the tank will be drained:

- Automatic - after fulfilling the condition for release;
- After confirmation - based on a system notification that the tank can be drained.

Drain confirmation can be set in the following modes:

- Drain when id needed: The system will drain the tank as soon as it is needed (the system no longer has the capacity to store additional waste) or if the tank is no longer active.
- Drain immediately: Tanks that meet the limits and can be drained are automatically offered to the operator.

DETECTOR MAK-201

Detector	NaI(Tl)
Crystal ($\varnothing \times h$)	1 × 1"
Reference radionuclide	¹³⁷ Cs, 1 kBq
Measurement range	10 MBq/m ³ – 20 GBq/m ³
Energy resolution (¹³⁷ Cs)	> 8 %
Number of MCA channels	1024
Number of monitored radioisotopes	1 - 4



SYSTEM RESYS

The retention tank system controls the RESYS system, which is installed in a switchboard near the retention tanks and consists of:

- industrial automation (PLC) for tank technology control,
- technological computer with a monitor for controlling retention tanks,
- a router with a firewall for secure separation of the RESYS system from the user's computer network.

The technological computer with the RESYS SW installed is used for archiving measured data, presenting data to users and setting or controlling tank technology to the user.

An LCD monitor with a computer touch screen is installed on the cabinet door.

It is possible to connect other user computers to this computer via Ethernet LAN, on which the RESYS SW can be installed. From these PCs, the authorized user can control the system of retention tanks from a remote workplace after logging in.

The SW provides users with information about the state of waste in individual tanks and also about the volume and activity of waste released in the past. The software also allows you to print predefined protocols.

PROVIDED SERVICES

- initial proposal for a solution for draining waste from the workplace;
- consultations and calculations of tank volume, dose rates, required shielding, etc. ;
- securing a permit at locally competent state authorities to use the technology
- complete design documentation;
- complete material deliveries, including the installation of a system of extinction tanks at the customer's site;
- calibration of MAK-201 detectors;
- customer support for the commissioning of the system, including staff training;
- as-built documentation;
- support with the operation and maintenance of the system.

RELATED PRODUCTS

MDG-04 Smart Dose Rate Meters

RDU-22 Radiation Display Unit

ASU-50 Alarm Slave Unit

HF Hand-Foot Contamination Monitor

PAM Portable Activity Meter

FCM-11 Frisking Contamination Monitor

