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How the uranium enrichment SC «PA ECP» won the trophy as the «Best Fuel Company Enterprise for Civil Protection» from Russia's TVEL

In January 2015, the Stock Company «Production Association Electrochemical Plant», located in Zelenogorsk, Russia (formerly known as Krasnoyarsk-45), was declared the winner of the 2013-2014 TVEL challenge cup for "Best Fuel Company Enterprise for Civil Protection" at a nuclear fuel facility. The competition is held every two years by TVEL, one of the world's largest producers of enriched uranium and isotope products.

This is the second time that the prize has been awarded to SC «PA ECP», which won in 2009-10 – an unprecedented achievement. Reflecting the successful realisation of ambitious plans, the plant's general director Sergey Filimonov was handed the 2013-2014 prize by the head of mobile works, civil defence and emergency at TVEL.

A key factor in the winning of the prize was the plant's Automated Measuring System for Industrial and Ecological Monitoring (AMSIEM) along with its automated mobile system for emergency response (ASEMKAR). A demonstration of these systems was given by plant personnel, with the involvement of representatives of the fire brigade and department of civil defence.

The basics of the system are shown in the illustrations.

There is provision for continuous environmental monitoring of the area occupied by the fuel facilities, including industrial zones, work places and storage facilities, as well as the city of Zelenogorsk (population 70000).

The environmental monitoring employs technology provided by Saphymo of Germany, at the heart of which is the SkyLINK

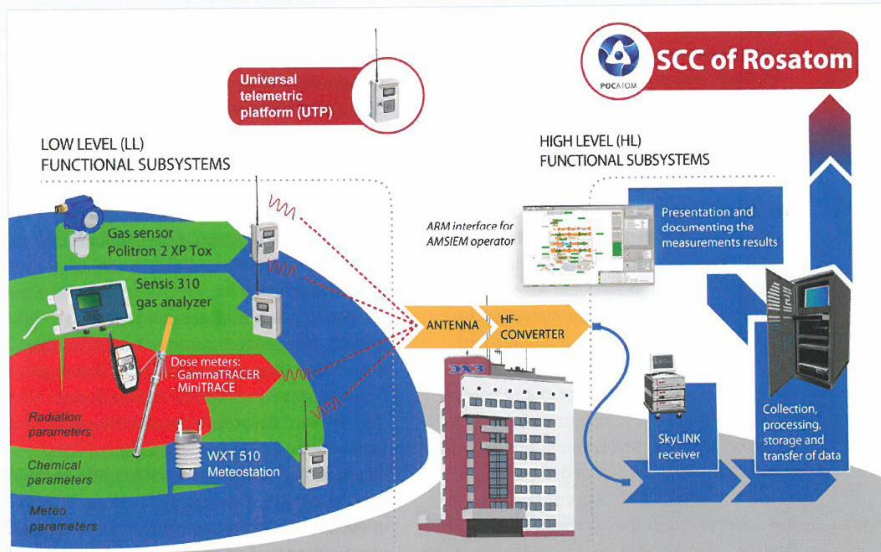


proprietary radio system for wide-area monitoring. This reliably collects data from various types of sensors and transmits them up to 100 km. Under harsh environmental conditions it has provided stable performance since its installation in 2010.

Currently the system comprises 13 GammaTRACER gamma dose rate probes, 40 chemical sensors in the industrial zone (mainly HF, also NH₃, NO₂, SO₂ (mg/m³)), seven chemical sensors for the ECP perimeter and the city and one meteorological station.

In the case of the individually set threshold values being exceeded an alarm is triggered. All data are collected, processed, visualised, archived and fed into an emergency planning forecast model for decision makers. This involves various levels of regional and national administration, including the municipality of Zelenogorsk, the region of Krasnoyarsk and the Rosatom headquarters, Moscow.

Due to their very low power requirements (only 10 mW for data transmission) GammaTRACER probes operate continuously for up to ten years without the need for battery exchange. The various chemical sensors are integrated into the systems via Universal Telemetry Platform, and also come with battery back-up.



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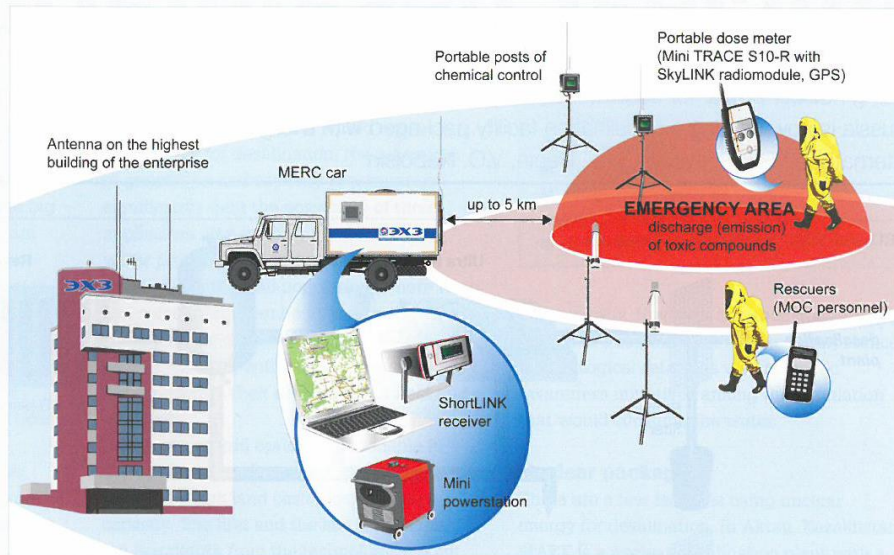


The monitoring system was extended in 2013 to include mobile capabilities. In MCER (Mobile Complex for Emergency Response), the more easily deployable probes along with hand-held MiniTRACE radio gamma dose rate meters (including GPS) have been integrated with a mobile ShortLINK radio receiver to enable mobile operation over a range of 5 km, employing a measurement truck which acts as the Mobile Operations Center (MOC) or Emercom HQ.

A range of mobile equipment is available at MCER control posts in Zelenogorsk. This includes the latest Saphymo equipment for completely unmanned deployment of probes. For emergencies, in particular, the innovative self-erecting GammaTRACER Spider provides maximum protection for first responders as it can be dropped to any site by quadcopter and offers several emergency-proof options for communication, including satellite.

For situations where the nature of gamma radiation needs to be identified a future expansion of the equipment will include the new SpectroTRACER probe for air, soil and water measurement. Even in such difficult conditions, parts of the data can be SkyLINK/ShortLINK transmitted to serve as back-up, in addition to principal operation via LAN, WIFI, GPRS or satellite.

Installation, training, maintenance and system extensions have been carried out by technical personnel from Soyuzatompribor, Moscow, who have also installed a number of other similar



systems, for Russian nuclear power plants, RosRAO and other industrial enterprises. For the Krasnoyarsk regional authority, which is responsible for monitoring a number of potentially dangerous facilities in the area, the SC «PA ECP» approach provides a model for the newly created Center for Environmental Safety. ■



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