REMOTE RADIATION ENVIRONMENT MONITORING

A. M. PASHAYEV, A. Sh. MEHDIEV and A. A. BAYRAMOV
National Aviation Academy, Airport Bina, Baku, Azerbaijan

Corresponding author: bayramov_azad@mail.ru

ABSTRACT:

The environment radiation monitoring system was developed. Measurements with the help of “EKOMON” fixed stations, consisting of appropriate sets of registration, the analysis and transfer of received data on an off-wire communication circuit and an autonomous supply set being planned to monitor ecological environmental factors: a level of an electromagnetic background, density dangerous and noxious gases, temperatures, pressure, atmosphere and wind speed. It will allow more precisely and to forecast development of an ecological situation not only in Azerbaijan, but also in whole of the neighboring states.

Keywords: Radiation safety, environment, automated monitoring, emergencies and ecological catastrophes.

INTRODUCTION:

Azerbaijan Republic doesn’t have nuclear apparatuses, nuclear reactor, nuclear energy systems and nuclear materials technologies. But our country has frontier with the countries, which have nuclear technologies. Before the accident at the Chernobyl Atomic Power plant the greatest concentrations of $^{90}$Sr and $^{137}$Cs were 1-30 Bk/kg. After the accident, the concentrations of these radionuclides in the earth levels were increased by 2-3 times. At the same time the quantity of radionuclides falling from atmosphere were also changed accordingly.

Evidently the accident in the nuclear reactor, the waste will affect the air, water basins, and the ground surface of Azerbaijan. It will also affect on the mass of radionuclides. The safe development of nuclear technology of our neighbor countries is important for the safety of the people of Azerbaijan. Next new developments of our neighbors are important in radiation safety of our Republic:

1. Armenian Nuclear Electric Power Station and reactions operating there.
2. WER type, 316 MW reactor - Atomic power plant at Medzamor, Armenian.
3. Research nuclear reactor was stopped in Georgia.
4. Nuclear equipment and different reactors placed in the European part of Russia.
5. WER-1000 nuclear reactor being built at Bushire, IRAN.
6. Technological equipment for nuclear material of Kazakhstan.
7. The purposed nuclear reactor with high-speed neutrons with vapor and pollution output, in Aktou, Kazakhstan.
Now, the project of the automated remote monitoring of environment background radiation in settlements along the boundary of Azerbaijan, and also along eastern suburbs of Azerbaijan regions inhabited by Armenia’s army, was fully developed. The main purpose of the project is:

- Increase of a level of a radiation safety on territory of Azerbaijan,
- Controlling of a level of an environment and background radiation on boundary of the Azerbaijan with the purpose of well-timed warning and acceptance of indispensable measures at probable emergencies on Atomic Power Stations in a number adjacent from Azerbaijan countries, or other ecological catastrophes,
- Controlling a level of an environment background radiation along eastern suburbs of Azerbaijan regions occupied of Armenia’s army and detection of the facts of wrongful disposals of atomic engineering waste generated by Armenia on territory of Azerbaijan.

As is known, in a number adjacent Azerbaijan countries the nuclear industry is advanced or being developed. It has resulted in origin of a threat of radiation hazard in case of ecological catastrophes: may be a wide scale leakage of radioactive wastes, explosions, or fires on nuclear generating plants, acts of sabotage, directional against Azerbaijan. In this case, at unfavorable meteorological conditions, a radioactive waste may be brought by a wind or a rain on territory of Azerbaijan.

Due to a huge atomic power station construction in Bushire (IRAN), it is necessary to estimate an initial background radiation along southern boundaries of Azerbaijan, that to determine probable changes in an ecology of southern boundaries during regular maintenance of atomic power station. Other one is an Armenian atomic power station, which is the padding center of a heightened radiation hazard in the Caucasian region. It is stipulated by several reasons:

- territory of Armenia is heightened seismic activity, therefore in case of earthquake there is a threat of destruction of generating sets of the Armenian atomic power station;
- because of absence of direct land transport communicational linkages, Armenia is not capable to remove waste products of atomic energetic to Russia, therefore it is rather probable, that these highly a radioactive waste dump on occupied territories of Azerbaijan;
- the atomic power station is the object, requiring of realization of regular, different repair-preventive actions, which highly qualified Russian and Armenian experts conducted one in the Soviet period. However after the collapse of the USSR scientific and technical links between scientists of republics were broke, and many experts leading in the field of atomic engineering have left the country. Therefore, as it is noted also by experts in Yerevan, Armenia, safety in operation of the Armenian atomic power station to be on a low level because of impossibility of realization of well-timed repair-preventive activities.

From this, realization of round-the-clock control of the environment conditions, first of all a background radiation check, along the boundary of Azerbaijan, and also along eastern remote areas is extremely a big problem.