OSART Good Practices
RADIATION PROTECTION
Radiation protection support during emergencies

Rovno 3/4, Ukraine

Mission Date; 24 Nov.-11 Dec, 2008

Automated Radiation Monitoring System

The Automated Radiation Monitoring System (ARMS) is in operation at Rivne NPP. The ARMS system, in parallel with the site radiation monitoring systems, measures and monitors the activity of gaseous and aerosol releases, liquid effluents and radiation environment on the site. ARMS measures and monitors also the dose rate, iodine and aerosol activity in the air of the surveillance area. Meteorological parameters are measured and high altitude atmosphere probing is performed up to 3000 m. ARMS data are used to calculate doses from actual releases and effluents for the critical group of public and to predict radiation environment in case of possible emergencies. ARMS implementation allowed to enlarge and improve the efficiency of radiation monitoring, as well as to improve the response procedures in case of radiation accidents.

Koeberg, South Africa

Mission Date; 22 Aug.-8 Sep., 2011

Emergency Monitoring Vehicles are fitted with real time simulation software and Global Positioning System capabilities for use in Emergency Exercises.

Field Survey Vehicle Radiation Simulator:

The Emergency field team vehicles are equipped with a real time simulated radiation and air sampling software programme. By inserting relevant information, up to 5 survey vehicles can simultaneously be used for plume chasing. The information is based on release time, wind speed, wind category and wind direction. It can also be used to obtain EPD data and has a function to simulate deposition surveys (cpm), after the plume has passed. It also automatically calculates the leading edge and can also be used to follow the trailing edge of a plume in the event of the release being terminated. It uses GPS co-ordinates to project the radiological conditions within the affected area on the laptop identical to what would be shown if the vehicle was inside a radioactive plume. This ultimately means that the RP personnel inside the vehicles need to search for the plume as directed by the Field Team leader. They do not have any maps showing plume direction or doserates at their disposal, as they need to rely on the instrument readings. The information is displayed as if it were real and then the communication system is used to its full potential, i.e. as the RP individual passes through the plume he would simply capture all GPS / dose rate information by a press of a button and then data sent via satellite to the Emergency Control Centre.

The use of the simulator ensures that a realistic environment is created without the use of radioactive material, which ultimately means that the conditions simulated are the same as they would be in the event of an actual release. This process also results in real time surveys, which in turn results in representative time intervals that the Emergency Control Centre receives data.

Kozloduy, Bulgaria

Mission Date; 26 Nov.-13 Dec., 2012

Monthly training on response to unanticipated situations performed for each radiation protection shift.
The Emergency Training in the Operational Radiation and Dosimetry Monitoring section for the operating personnel is performed on a monthly basis.
The scenarios are developed in advance and described in the site Instruction on the Implementation of Emergency Training and are renewed for each calendar year.
The goals of the repeated training are as follows:

-Registration of the occurred change in the situation, reporting and localizing the emergency, as well as non-admission of spread to other equipment or premises;
-Training of the staff for actions in case of emergency situations;
-Improve all shifts to adequately react and undertake the same actions on identifying the event source term;
-In case of the occurrence of such event, the actions of the staff are expected to be quick, accurate, correct, so that they would contribute to the clarification of the situation;
-During the emergency the whole staff is expected to react in a strictly defined succession of actions. These actions shall also contribute to the decreasing of the dose exposure for the workers who participate in the emergency liquidation;
-Initiation of open discussions to help resolve a given problem.

Kozloduy, Bulgaria

Mission Date; 26 Nov.-13 Dec., 2012

Automated Aerological Probing System

Automated Aerological Probing System (AAPS) is designed to measure the atmospheric parameters in vertical profile in case of emergencies. The measurement is achieved by the instruments (GPS, temperature, pressure) attached to the balloon that is released to the atmosphere in case of necessity. The following meteorological parameters are determined:
-mixing layer height;
-main atmospheric transfer direction and speed;

The two values - mixing layer height and main transfer speed and direction are extremely important for all model scales (from the ones of NPP area to those of transboundary contamination). They are used to determine the spreading of radionuclides in the atmosphere, their settling and ground concentrations, depositions, and radiation exposure. Where such data is unavailable, some averaged values are used for the respective geographic region or some calculation from semi-empirical formula based on data from ground parameters. With this data the prediction of atmospheric dispersion is improved.

Data for the above parameters are used in the model for evaluation and forecast of the radionuclide spreading within the 30 km area in case of accident.

The plant exercises the Automated Aerological Probing System launching the balloon once every three months.