RADIOLOGICAL SURVEY OF THE ITREC PLANT

ABSTRACT

The Itrec nuclear facility was a U-Th fuel reprocessing and fabrication pilot plant in operation during ‘70s , located in Trisaia (South Italy).
The planning and the implementation of decommissioning strategies for the Itrec plant require knowledge of the contamination levels reached during operation and still present following shutdown. Therefore a characterization programme has been implemented as an initial step of the decommissioning.
The characterization programme had comprised four main steps:
a) Review of Historical information
b) Performance of radiometric survey
c) Performance of Non-destructive radiological analyses
d) Performance of Destructive radiological analyses
Reviewing the Historical information of the facility provided useful information for the management of the plant characterization (list of radionuclides to be investigated, definition of the “characterization area covered by the radiological analysis, definition of the homogeneous group, etc).
In the second step, scanning measurements (Dose Rate measurements, Surface contamination measurements and qualitative spectrometry measurement with NaI detector) have been performed to map the surface contamination and radiation dose and to locate radiation anomalies (hot spots).
Measurements using an in-situ High Resolution Gamma Spectrometric system have been carried out in order to quantify gamma emitters in system components (valves, pumps, tubes, tanks, etc.) and in building structures (walls, floors etc.). Finally Destructive radiological analysis have been performed in order to determine the activity of hard-to-measure radionuclides and to determine nuclide vectors (scaling factors) enabling to correlate concentrations of hard-to-measure nuclides with concentrations of the strong gamma emitting key radionuclides.
The report illustrates the implementation of the characterization plan using statistical approach and the main results.