

AMS and ICP-MS for actinides and ^{137}Cs results around a Nuclear Power Plant

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Italy built and commissioned 4 nuclear power plants between 1958-1978, which delivered a total of 1500 MW. All four were closed down after the Chernobyl accident following a referendum in 1987. One of the plants was Garigliano, commissioned in 1959. This plant used a 160 MW BWR1 (SEU of 2.3 %) and was operational from 1964 to 1979, when it was switched off for maintenance. It was definitively stopped in 1982, and is presently being decommissioned. We report here details on the chemistry procedure and on the measurements for environmental samples, collected up to 4.5 km from the Nuclear Plant. A comparison between uranium concentration as determined by means of AMS (Accelerator Mass Spectrometry) and by ICPMS (Inductively Coupled Plasma-Mass Spectrometry) techniques respectively at the ANU (Australian National University) and at the Ecowise company in Canberra, Australia, is reported, as well as ^{239}Pu concentration results. Isotopic ratios by means of AMS for both U and ^{239}Pu are also derived. A contribution from Chernobyl is visible only in the concentration of ^{137}Cs from gamma activity measurements.