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## **Analysis on characteristics of occupational radiation source items during AP1000 unit overhaul**

More than 80% of occupational exposure in PWR nuclear power plants comes from overhaul,  $\gamma$  Deposition source term is the main source of occupational exposure during nuclear power plant overhaul. As the third generation advanced PWR nuclear power plant, it is necessary to measure and analyze its deposition source term during overhaul, so as to understand the main components of radionuclides in occupational radiation contributors and provide data for the optimization and evaluation of occupational radiation dose. During the first overhaul of AP1000 unit, the deposition source terms of main pipelines such as cold leg and hot leg in its main circuit system were analyzed in situ  $\gamma$  The spectrum is measured and compared with the source term data of typical M310 unit. It is found that the pipeline exposure dose rate of main circuit system of AP1000 unit is significantly lower than that of typical M310 unit. The average surface exposure dose rate of AP1000 unit's main loop system pipeline is  $100 \mu\text{SV} / \text{h}$ , the average surface contact dose rate of main circuit pipeline of typical M310 unit is  $300 \mu\text{Sv/h}$  ; The main nuclides are co-58, Co-60 and Fe-59. The average surface activity of nuclide co-58 is  $104\text{Bq} / \text{cm}^2$ , the average surface activity of nuclide co-58 in typical M310 unit is  $105\text{Bq}/\text{cm}^2$ .The main reason why the pipeline exposure dose rate of the main circuit system of the AP1000 unit is lower than that of the typical M310 unit is that the compact structure of the main circuit pipeline in the AP1000 unit reduces the source of corrosion; The AP1000 unit began to inject zinc from the first cycle, reducing the corrosion and activation of Ni and CO in the substrate, so that the activity of nuclide co-58 is at a low level.

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