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## Addition of aluminum salts to water for reducing Co-60 in activated corrosion product deposits on primary system surfaces of nuclear reactor plants.

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Radiation situation in occupied areas of nuclear reactor plants is much determined by the activity of loose corrosion product deposits (crud) in the primary system. Co-60 present in crud is the major contributor to personnel exposure because it has a long half-life period and emits hard  $\gamma$ -radiation. Experimental studies have been performed to analyze the possibility of reducing Co-60 in crud on the primary system surfaces. Mechanisms of hydrolysis polymer product formation in mixed nitrate solutions of Fe(III) + Al(III) + Co(II) have been investigated. This hydrolysis process models hydrolysis of corrosion products in the primary coolant water where aluminum salts are added. Analyses have been carried out with gel permeation chromatography and radioisotope and elemental analysis methods. The analysis results show that almost all Co(II) ions which entered hydrolysis polymer products during their initial formation are substituted by aluminum ions as the polymer products age. Since these polymers are precursors to occurrence of loose corrosion product deposits on the primary system surfaces and these deposits include Co-60 as the most important source of radiation exposure, the analysis data attributes improved radiation situation in the occupied areas to addition of aluminum salts to the primary coolant water and demonstrates the usefulness of this addition.

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