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JAPAN

R-349

## OPERATING EXPERIENCE OF JAPANESE IMPROVEMENT AND STANDARDIZATION BWRs AND BEHAVIOR OF RADIOACTIVITY IN REACTOR WATER

**Keywords:** CONTAMINATION PREVENTION; COBALT; DOSE REDUCTION; PRIMARY COOLANT CHEMISTRY

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**Objectives:** This paper describes the increasing concentration of radioactivity in reactor water at Japanese BWRs and the results of studies to clarify this phenomenon.

**Comments:** In new Japanese BWRs, increased Co-60 concentrations are occurring which may cause an increase in plant dose rates as operation continues year after year. To suppress such dose rate increases at new plants, the investigators have begun to study the causes of increased Co-60 concentrations. The following possibilities were suggested:

- 1) dissolution speed of fuel deposits accelerating due to reduced reactivity of Fe and Co
- 2) dissolution speed of fuel deposits accelerating due to change of oxidized surface conditions of new fuel cladding
- 3) dissolution speed of fuel deposits increasing due to production of high Cr content deposits by increased feedwater Cr concentration
- 4) highly corrosive fuel spacers

**Remarks/Potential for dose limitation:** Measures implemented by new plants:

- 1) use of corrosion-resistant materials for the turbine system
- 2) dual condensate purification facility
- 3) oxygen injection into feedwater system
- 4) use of low-Co materials in feedwater-heater tubes, fuel-spacer springs, and control rod pins and rollers
- 5) pre-filming
- 6) Fe/Ni ratio control

**References:** Aizawa, M., Ohsumi, K., Asakura, Y., Morikawa, Y., Hirahara, Y., Sakai, T., and Haraguchi, K., "Operating Experience of Japanese Improvement and Standardization BWRs and Behavior of Radioactivity in Reactor Water," *Water Chemistry of Nuclear Reactor Systems 6*, Vol. 1, pp. 39-44, British Nuclear Energy Society, London, 1992.

**Duration:** from: 19 to: 1994

**Funding:** N/A

**Status:** In Progress

**Last Update:** June 8, 1993