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R-357

ON-LINE MEASUREMENT OF PARTICLES IN REACTOR WATER OF BWRS

Keywords: CONTAMINATION PREVENTION; ON-LINE MEASUREMENT;
RADIATION FIELD; WATER CHEMISTRY

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Objectives: To measure the number, size, and composition of particles in the primary cooling water of a BWR.

Comments: A high temperature and pressure cell (290°C, 90 bar) was developed and tested in an out-of-pile loop. The equipment was subsequently used in cooled reactor water in the NPP Leibstadt. During steady state, power reduction, and the shutdown operation, the number and size of particles were measured. Additional chemical and radiological analyses were done to give information regarding particle composition. A POLYTEC HC 70 was used to measure suspended material in the reactor water. By measuring on-line, the investigators were able to determine at what times during the reactor cycle the activated products were bound to particles, and at what times they were "dissolved" and not bound.

Remarks/Potential for dose limitation: In the primary circuits of water cooled reactors, activated corrosion products such as Co-58, Co-60, and Mn-54 are transported and deposited on the walls. Since the deposited activity causes a radiation field that makes maintenance work more difficult, it would be of great importance to control the deposition process.

References: Schenker, E, Francioni, W., and DeGuelde, C., "On-line Measurement of Particles in Reactor Water of BWRs," *Water Chemistry of Nuclear Reactor Systems 6*, Vol. 1, pp. 133-139, British Nuclear Energy Society, London, 1992.

Duration: from: 1990 to: 1992

Funding: N/A

Status: Completed

Last Update: June 10, 1993