

Radiation Damage and Aging Accelerator Components at the SPring-8

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We encountered degradations caused by the radiation damages or aging of the accelerator components, during more than 16 years of operation of SPring-8 accelerator complex. Some of them invoked beam aborts during the user time. Others were found in the occasion of the regular inspections during annual maintenance periods, and had no effects on the user time, but countermeasures or cures were required. Some cases of these experiences will be presented.

Examples of the degradations are pneumatic tube breaks, corrosion of water cooling pipes by chemicals in the cooling water, chemical reactions induced by synchrotron radiation in the absorber cooling water path, radiation damage on the rubber hoses for magnet cooling water, etc. Some of them were caused by inadequate usage condition, while the others occurred even under normal usage conditions. Causes of these phenomena will be described. Countermeasures including such as shielding of the components from the scattered X rays, modification of the structure of the absorbers will be also presented.
