

Research Project on “Plant Life Management of Light Water Reactors” (PLM Project)

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Backgrounds

Nuclear power generation is a fundamental power source occupying about thirty percent of all electricity in Japan and is expected to play an important role as one of key elements in global warming restrictions in future. On the other hand, light water reactors early constructed in 1970s have been operated for more than thirty years. In future, the number of aged light water reactors will increase rapidly, hence the need to urgently investigate the ageing effects on components and materials. With this in mind, today, ageing research has been actively promoted within the national government, universities, and industries.

Under such circumstances, the Central Research Institute of Electric Power Industry (CRIEPI) in May 2007 reconstructed related research subjects in the Material Science Research Laboratory and Nuclear Technology Research Laboratory for effective ageing research, applying its conventional research potential, and established Research Project on “Plant Life Management of Light Water Reactors” (PLM Project).

Research Contents

The research project on “Plant Life Management of Light Water Reactors” adopted three material ageing phenomena on **Neutron Irradiation Embrittlement, Stress Corrosion Cracking (SCC), and Pipe Wall Thinning** as typical problems on ageing in order to clarify its fundamental mechanism, and develop a new material database as well as means of predicting and assessing ageing phenomena, while also reflecting the results in codes and standards to help ensure the integrity and safety of aged light water reactors. In addition, since April, 2008, research targets have been expanded to include subjects for cable deterioration and non-destructive inspections, which were promoted in this project.

Major research subjects

- (1) Investigation of the irradiation embrittlement mechanism in light water reactors and an advanced assessment method for the same,
- (2) Advanced assessment technology for stress corrosion cracking propagation in light water reactor materials,
- (3) Clarification of the wall thinning effect of light water reactor piping and advanced assessment technology for the same and
- (4) Assessment of cable isolation deterioration and the development of non-destructive inspection technology

