CORROSION AT NUCLEAR POWER PLANT FROM MÖSSBAUER SPECTROSCOPY POINT OF VIEW

V. Slugen[1], J. Lipka[1], J. Dekan[1], I. Toth[1], I. Smiesko[2]

[1]Department of Nuclear Physics and Technology, Slovak University of Technology Bratislava, Ilkovicova 3, 812 19 Bratislava, Slovakia;
[2]NPP Jaslovské Bohunice, SE, a.s., Slovakia.

Steam generators of four VVER-440 units at nuclear power plants V-1 and V-2 in Jaslovske Bohunice (Slovakia) were gradually changed by new original "Bohunice" design in period 1994-1998. Corrosion processes before and after these design and material changes in Bohunice secondary circuit were studied using Mössbauer spectroscopy during last 25 years. Innovations in the feed water pipeline design as well as material composition improvements were evaluated positively. Mössbauer spectroscopy studies of phase composition of corrosion products were performed on real specimens scrapped from water pipelines or in form of filters deposits. The corrosion of new feed water pipelines system (from austenitic steel) in combination to innovated operation regimes goes dominantly to magnetite. The hematite presence is mostly on the internal surface of steam generator body and its concentration increases towards to top of the body. In the results interpretation it is necessary to consider also erosion as well as scope a type of maintenance activities. The long-term study of phase composition of corrosion products at VVER reactors is one of precondition for the safe operation over the projected NPP lifetime.

Presenting author: **Vladimír Slugeň**
Address: **Ilkovicova 3, 812 19 Bratislava, Slovakia**
E-mail: **Vladimír.Slugen@stuba.sk**