Non-Destructive Testing Applied on Model Nuclear Power Plant's Structural Materials - First Approach for Magnetic Barkhausen Noise Technique

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Abstract. The so-called "RPV (reactor pressure vessel) Model Steels", represented by 12 ferritic steels with the parametric variation of alloying elements were developed at EC - JRC Petten (the Netherlands). Their composition was derived from compositions typical for WWER-1000 (water-water energetic reactor) and PWR (pressurized water reactor) RPV materials. To understand the role and influence of certain alloying elements and impurities on the behavior of steels during operation of NPP (nuclear power plant), the set of RPV Model Steels was irradiated in the High Flux Reactor -LYRA irradiation facility (Petten, the Netherlands) in a joint NRG-JRC irradiation experiment to the nominal fast neutron fluence (E>1 MeV) of 1.11×10^{20} n.cm^{-2}, as part of STRUMAT project. In this paper, we present the first approach to assess the irradiation - induced changes by the magnetic Barkhausen noise technique.