

## OPTIMIZATION ALGORITHM FOR A SEMI-PROBABILISTIC ASSESSMENT OF REACTOR PRESSURE VESSELS UNDER PRESSURIZED THERMAL SHOCK

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**Abstract.** Update of the Pressurized Thermal Shock analysis is required by the Argentinean regulator (ARN) in order to extend the operational license of Atucha I Nuclear Reactor. The effect of the neutron irradiation is to increase the ductile-to-brittle transition temperature (DBTT) represented by the master curve of the material. The traditional failure criteria meets the requirement that fracture toughness equal the stress intensity factor (SIF) that depends on the accident transient and the size of the postulated defect. In the designer deterministic approach, the postulated defect is fixed. In order to take into account the effect of the postulated defect size through a semi-probabilistic analysis, the FLEPA.v.7.1 code was developed incorporating an optimization algorithm in the context of ASME XI SIF approach. The code was validated against another code used by Argentinean National Atomic Energy Commission (CNEA).