

New Method Manufacturing of Control Rod Wing for Nuclear Reactor 45,7 MW

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Abstrak

Using the quantum approaching, the nuclear control rod wing shape optimization method based on control theory in nuclear structure have been intensively developed especially in Canadian Deuterium Uranium (CANDU) nuclear research reactor. The control rod blade dimensions include 5 meters length, 0.80 meters diameter, and 0.11 meters thickness and it has the wing for thermal neutron reaction controlling at the Cerenkov's radiation coming up. Moving on normally with 76 mm/second velocity. The floating of U particle in 2.1×10^5 currie/mm thermal neutron flux is one problem in nuclear control rod wing manufacturing. Based on quantum approaching in transuranium nuclear chain control theory, the structural and thermal neutron flux flow is the best optimization technique for 450 tesla magnetic field weight and 45.7 MW adjusted power. This research purposed for new shape of nuclear control rod wing by several mathematical formulations have been modeled by Euler equations and build the miniature of control rod wing, then the angle has expected around 37.6° until 421° based on Sr20 matrix as the primer material and DUO; loading is the nuclear chamber: