

**Recent Advances in the Design of a Cyclotron-Driven, Intense, Subcritical Neutron Source**, P. COHILIS, Y. JONGEN, G. LANNOYE, IBA; H. AÏT ABDERRAHIM, P. D'HONDT, L. VAN DEN DURPEL, SCK-CEN - Most of the nuclear reactors used today for radioisotope production (mainly  $^{99}\text{Mo}$  for nuclear medicine), research and industrial applications, are due, in the next years, for a major refurbishment or for decommissioning. As an attractive, competitive alternative, the authors recently proposed a subcritical, cyclotron-based spallation neutron source, with neutron multiplication by fission. The system includes a 150 MeV, high intensity cyclotron and a molten Pb-Bi primary target surrounded by secondary targets in a water moderator. The secondary targets contain a subcritical amount of  $^{235}\text{U}$ , for neutron multiplication. The present paper presents some recent advances in the design of this system. The cyclotron will be based on the negative ion technology. The target will be vertical with the liquid lead-bismuth flowing out of a ring-type nozzle into an open channel, where the fluid interacts with the proton beam and is in direct contact with the vacuum. The design corresponding to the optimal configuration for  $^{99}\text{Mo}$  production will be presented.