



Presented at NDE2002, to predict. assure. improve. www.nde2002.org
National Seminar of ISNT, the Indian Society for Non Destructive Testing
Hotel Taj Connemara and Raja Muthiah Hall, Chennai, 05. – 07. 12. 2002

Development of Leak Testing Technique and X-ray Radiography Technique for Inspection of PHWR Mox Fuel Pins

D. B. Sathe, D. Mukherjee, N. Walinjkar, A. K. Hinge, J. P. Panakkal, H. S. Kamath

Advanced Fuel Fabrication Facility, Bhabha Atomic Research Centre, Tarapur

Abstract

AFFF is taking up the fabrication of fuel pins containing mixed oxide (MOX) pellets for experimental irradiation in Pressurized Heavy Water Reactors (PHWR). MOX fuel pellets are made from the oxides of Uranium (UO_2) and Plutonium (PuO_2). These fuel pellets are manufactured by powder metallurgical route consisting of steps like mixing, compaction, sintering and grinding. These pellets are then encapsulated in clad tubes already welded with spacer pads. All these operations are carried out in Glove Boxes. Therefore it was felt necessary to introduce an additional step of Helium Leak Testing to ensure the quality of spot welds of spacer pads before encapsulation. Special fixture was developed for the same. The details are discussed in the paper.

The fuel tubes are sealed by TIG welding procedure. X-ray Radiography therefore is introduced to check the integrity of the end plug welds. For this purpose, a suitable Shape Correction Block has been designed and fabricated. The Shape correction block compensates for the variation in thickness of the test object. Thus it makes the film density constant in the area of interest increasing the visibility of the defects. The details of different designs of shape correction blocks are discussed with their merits and demerits in the paper.