Risk associated with the transport of radioactive materials in the fuel cycle

F. Lange (1), J.H. Mairs (2), J.-C. Niel (3)

(1) GRS, Schwertnergasse 1, D-50667 Köln, Germany
(2) United Kingdom’s Department of Transport, London
(3) IPSN, BP 6, 92265 Fontenay-aux-Roses Cedex, France

This paper sets out the regulatory framework within which nuclear fuel cycle materials are transported. It establishes the basic principles of those safety regulations and explains the graded approach to satisfying those requirements depending on the hazard of the radioactive contents. The paper outlines the minimum performance standards required by the Regulations. It covers the performance standards for Type C packages in a little more detail because these are new to the 1996 Edition of the IAEA’s Regulations for the Safe Transport of Radioactive Material and are less well reported elsewhere at present. The paper then gives approximate data on the number of shipments of radioactive materials that service the nuclear fuel cycles in France, Germany and the UK. The quantities are expressed as average annual quantities per GWel installed capacity. There is also a short discussion of the general performance standards required of Type B packages in comparison with tests that have simulated specific accident conditions involving particular packages. There follows a discussion on the probability of packages experiencing accident conditions that are comparable with the tests that Type B packages are required to withstand. Finally there is a summary of the implementation of the Regulations for sea and air transport and a description of ongoing work that may have a bearing on the future development of mode related Regulations.

Nuclear fuel cycle materials are transported in accordance with strict and internationally agreed safety regulations which are the result of a permanent and progressive process based on social concern and on the advancement of knowledge provided by research and development. Transport operations take place in the public domain and some become high profile events in the management of these materials, attracting a lot of public, political and media attention. The risks associated with the transport of radioactive materials are low and it is important that nuclear fuel cycle materials are managed in accordance with their actual rather than their perceived hazard. Transport is a vital component in the management of nuclear fuel cycle materials but it should not have an undue influence in the choice of fuel cycle strategies.