

4. FUTURE TRENDS

Safe management of nuclear radioactive waste is very important for the applications of nuclear energy, especially for exploitation of fission energy for electricity generation. While geological disposal in suitable repositories is considered as an unavoidable final step in any scheme of RW management, there have been particular concerns with respect to disposal of some very long lived fission product and alpha active minor actinide components of the spent fuel in nuclear power generation. Neutron transmutation of these problematic nuclides by a suitable method is being suggested as a possible way to attack this problem. It is also pointed out that these transmutation schemes may ultimately turn out to be quite attractive and economically viable since in these schemes minor actinides which are otherwise troublesome waste, also become additional fissile fuel. However, a number of important technological problems remains to be addressed and there is clearly the necessity for further active R&D in this field.

Partitioning and transmutation is a further extension of an efficient closed nuclear fuel cycle and, therefore, with future R&D in this field it is expected that this technology will be fully developed in the coming years to solve fuel problems of the nuclear industry and satisfy world energy needs. Rational use of uranium and thorium natural resources is impossible without serious, eventually multiple, recycling. It is especially true for large countries with large population and growing nuclear power programmes for electricity generation - China, India, Russia.

Active programmes in partitioning and transmutation research are now going on internationally, covering practically all the relevant aspects. Some of these important research areas are:

- radiochemistry of partitioning;
- fuel fabrication;
- physics of fast burner reactors;
- liquid metal coolants technology;
- nuclear data;
- advanced fuel cycles including those which are thorium based;
- accelerator driven transmutation technology.