(b) if so, the details thereof and the reasons therefor?

THE MINISTER OF STATE IN THE DEPARTMENT OF ATOMIC ENERGY (DR. JITENDRA SINGH): (a) and (b) Nuclear Power Corporation of India Limited (NPCIL) has been in discussions with M/s Westinghouse Electric Company (WEC), United States of America (USA) to arrive at a viable project proposal for setting up nuclear power plants in India. The filing of bankruptcy by M/s WEC has been noted. This would be factored-in during further discussions to ensure protection of our interests while arriving at the project proposals.

Disposal of radioactive waste materials

2086. DR. R. LAKSHMANAN: Will the PRIME MINISTER be pleased to state:

(a) whether Government is aware that one controversy or the other arises with regard to disposal of radioactive waste materials by atomic power plants located across the country;

(b) if so, the details thereof;

(c) whether Government has felt any need to formulate a comprehensive and foolproof policy in handling and disposing nuclear wastes;

(d) if so, the details thereof; and

(e) if not, the reasons therefor?

THE MINISTER OF STATE IN THE DEPARTMENT OF ATOMIC ENERGY (DR. JITENDRA SINGH): (a) No, Sir. There is a well established mechanism for management of radioactive wastes at nuclear power plants.

(b) Does not arise.

(c) Yes, Sir. An established policy in line with international procedures following the guidelines of International Atomic Energy Agency exists for handling and management of the nuclear wastes in our country.

(d) A comprehensive radioactive waste management policy having emphasis on waste volume minimization, recycle and reuse at par with international practices is established taking into account the operational capability for the management of radioactive waste and an independent regulatory capability for its review. As a waste

management philosophy, no waste is released/disposed to the environment unless the same is cleared, exempted or excluded from regulations.

Management of radioactive waste in Indian context includes all types of radioactive wastes generated from entire nuclear fuel cycle and also from installations using radionuclides in medicine, industry and research. A brief summary of the process being adopted for management/disposal of the nuclear wastes arising from nuclear facilities is given below:–

(1) Gaseous, waste is treated at the source of generation. The techniques used are adsorption on activated charcoal and filtration by high efficiency particulate air filter.

(2) Liquid waste streams are treated by various techniques, such as filtration, adsorption, chemical treatment, evaporation, ion exchange, reverse osmosis etc. depending upon the nature, volume and radioactivity content. The concentrates from liquid waste treatment are immobilized in suitable inert matrices.

(3) The radioactive solid wastes generated during operation and maintenance of nuclear facilities are segregated and volume reduced using technologies like compaction and incineration prior to their subsequent emplacement in engineered barriers to ascertain effective confinement of radioactivity and to allow its decay to innocuous level. These disposal systems are located both above and underground in access-controlled areas. These disposal systems are designed on multi-barrier principle for ensuring effective containment of radioactivity.

(4) In addition, a very small volume of high level radioactive liquid waste also gets generated during reprocessing of spent nuclear fuel. The same is immobilized into an inert glass matrix through a process, called vitrification. The vitrified waste is stored for an interim period in a Solid Storage Surveillance Facility for cooling prior to its eventual disposal in underground geological disposal facility. This policy is at par with international practices following the guidelines of International Atomic Energy Agency. With the advent of new technologies based on partitioning of waste, where long - lived radioactive waste constituents are separated prior to immobilizing

them in the glass matrices, the need of deep underground geological disposal facility will reduce to a great extent in near future. The long lived radio isotopes is planned to be burnt in fast reactors or Accelerator Driven Sub Critical systems to get it converted into short- lived species. Main fission products like Cs-137 and Sr-90 present in the waste are recovered using in house developed technologies and deployed for societal applications covering medical applications, external irradiators and other medical applications. This is accomplished for the first time in the world by India, where radioactive waste is regarded as a useful by-product.

(e) Not applicable.

Set up of nuclear reactors

2087. SHRI C. M. RAMESH: Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that Government has recently taken a decision to set up 10 nuclear reactors in the country;

(b) if so, the details thereof;

(c) to what extent this decision helps in increasing the atomic energy generation percentage from the present two per cent to, at least, the global average of elevan per cent; and

(d) the quantum of capacity addition can India has with this and how much time would it take to set up ten nuclear reactors?

THE MINISTER OF STATE IN THE DEPARTMENT OF ATOMIC ENERGY (DR. JITENDRA SINGH): (a) Yes, Sir.

(b) The Government has accorded administrative approval and financial sanction for construction of 10 indigenous 700 MW Pressurized Heavy Water Reactors (PHWRs) in fleet mode. The reactors are planned at Kaiga, Karnataka (Kaiga-5 and 6); Gorakhpur, Haryana (GHAVP-3 and 4); Chutka, Madhya Pradesh (Chutka-1 and 2) and Mahi Banswara, Rajasthan (Units-1 to 4).

(c) On progressive completion of the reactors, the nuclear power capacity would increase by 7000 MW. The exact increase in percentage share of nuclear power as a result of this capacity addition would depend on the addition of capacities from other sources at different points of time.