

(b) These cases of exposure are not directly resulting from release of radioactivity to environment from Fukushima disaster, but they are from the planned exposure situation during post clean-up operations at Fukushima. At low doses (within the safe limit), it cannot attribute radiation as the only cause of cancer if detected only in few individuals. The scanning of large number of population anywhere in the world can find cases of cancer like leukemia, lung cancer, thyroid cancer etc., even if they are not exposed to radiation. There is no scientific evidence of confirmed cancer incidences for exposure to less than 100 mSv and the exposure reported from Fukushima is much below this dose.

(c) Indian nuclear power programme believes in protection of the worker, public and their environment from potential radiation hazards, while at the same time making it possible for advancing the nation to enjoy all the benefits resulting from use of nuclear energy.

There is no reason to reconsider the decision of going ahead with nuclear energy programme in India. Fukushima accident was caused by an unexpected severe tsunami followed by a massive earthquake. Such major nuclear accident is not anticipated in any of the Indian Nuclear Power Plants due to their location as well as engineering design and operating condition.

The Indian Nuclear Power programme follows stringent guidelines on safety at all stages such as siting, design, construction and operation of nuclear power plant and strict regulatory control and compliance. The safety of the workers and public is ensured during normal operation as well as under off-normal conditions. Hence, the Government does not see any detrimental impact on worker and public due to nuclear energy programme.

#### **Deaths due to radiation related hazards**

486. SHRI DILIP KUMAR TIRKEY: Will the PRIME MINISTER be pleased to state:

(a) how many persons have died due to radiation related hazards, accidents and sickness in India's nuclear installation spread all over the nation; and

(b) the steps taken by Government to provide all the safety kits to people working in such places particularly the Uranium mines?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH): (a) There has been no death due to radiation related hazards, accidents and sickness in India's nuclear installations.

(b) The safety of the radiation workers in the nuclear installations, including the Uranium mines, is fully ensured by the Health Physics Unit (HPU) situated in every plant. It is also enforced by regular monitoring and regulatory inspections. Various types of protective equipment are provided depending on the type of operations being undertaken to ensure radiological safety of the workers. Moreover, they are periodically monitored by appropriate dosimeters to ascertain that the dose received by them does not exceed the stipulated/permissible limit.

For example, at all Nuclear Power Plants, as a first step of prevention, radiation exposure to occupational workers is controlled and maintained at very low levels. The occupational workers are imparted training on safety aspects prior to their employment. In addition, they undergo periodic refresher safety training courses during the period of their employment. For carrying out jobs in the Nuclear Power Plant, the occupational workers are provided with protective clothing like coveralls, boiler suits, lab coats etc., respiratory protective equipment like oro-nasal, iodine and airline respirators, ventilated plastic suits etc., and protective gears like rubber gloves and shoes, head caps, etc. Further, all occupational radiation workers are provided with dosimetry devices for close monitoring of their radiation exposure to maintain it well below the stipulated limits as set by Atomic Energy Regulatory Board (AERB).

#### **Steps to deal with nuclear waste**

487. SHRI AHMED PATEL: Will the PRIME MINISTER be pleased to state:

(a) whether as per the latest records, nuclear energy is cheaper than pit based energy for the final consumer, if so, the details thereof, State-wise/UT-wise;

(b) whether Government has been able to effectively deal with nuclear waste; and

(c) what is the impact of disposing nuclear waste on the overall cost that the final consumer would have to pay?

(d) THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH): (a) The tariffs of electricity through nuclear energy are comparable to those of the contemporary conventional base load power generating units (like coal based thermal power) located in the area/region. The tariffs of nuclear power projects presently in operation range from 94 paise per unit for the first generation plants at Tarapur Atomic Power Station Units 1 & 2 (TAPS-1 & 2) to 388 paise per unit for latest commissioned plant in Dec., 2014 at Kudankulam Nuclear Power Project (KKNPP). The average tariff of nuclear power was about 278 paise per unit in 2014-15. The range of tariffs of fossil fuel based sources of electricity in the central sector are given below: