

- (c) Does not arise.

**Discovery of God particle**

†626. CHAUDHARY MUNABBAR SALEEM: Will the PRIME MINISTER be pleased to state:

- (a) whether Indian scientists were involved in mega experiment which discovered God particle;
- (b) if so, the details thereof, and their contribution in this discovery;
- (c) whether such discovery is being made in India also; and
- (d) if so, the details thereof?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY): (a) and (b) The research for the Higg's Boson, popularly called the God particle started 30 years back. Scientists and engineers from Raja Ramanna Centre for Advanced Technology, Indore; Indira Gandhi Centre for Atomic Research, Kalpakkam; Variable Energy Cyclotron Centre, Kolkata; Bhabha Atomic Research Centre, Mumbai; Delhi University, IIT-Bombay, Mumbai; National Institute for Science, Education and Research, Bhubaneswar; Tata Institute of Fundamental Research, Mumbai; Punjab University; Visva Bharati; etc., are involved in this research project. Of the approximately 4000 researchers world-wide involved in this programme, about 80 are from India.

Since 1994 India has been participating in Large Hadron Collider (LHC) experiments in all aspects: These include the fabrication of LHC machine components (special types of magnets), fabrication of some of the sub-detectors for big experiments at LHC [Compact Muon Solenoid (CMS) and A Large Ion Collider Experiment (ALICE)] as well as development of grid computing technology and hosting two grid computing centres in India for the experiments.

Indian scientists are regularly participating and discharging various functions as a part of experimental programme like data collection, data quality monitoring, monitoring computing efforts for data process and transfer and detector performances. They are playing key roles in the analyses of data, scrutiny of results and presentation of results in international fora of scientists. Since the start of the LHC machine in November, 2009, the data collected during first two years have been primarily used to establish the credibility of the LHC experiments as a precursor to the discovery of Higg's Boson. The recent discovery is the outcome following the huge data collected by CMS experiment during 2011 and 2012.

(c) and (d) India alongwith other countries participated in this international collaborative experiment. As already indicated India has made large contribution in

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†Original notice of the question was received in Hindi.

setting up of the LHC facility and subsequently in the collection and analyses of experimental data arising therefrom, thus contributing significantly to the discovery.

**Vessel supplied by the vendor for Nuclear Power Plant**

627. SHRI D. BANDYOPADHYAY: Will the PRIME MINISTER be pleased to state:

(a) whether the reactor pressure vessel supplied by the vendor to the Kudankulam Nuclear Power Plant was found to be of an obsolete model developed in early 1980s and whether the pressure vessel has two welds while the international safety parameters require that there should be no welds in the pressure vessel; and

(b) if so, the reason why this pressure vessel was accepted with its possible proneness to accident and what precautionary measures have been taken to prevent any loss of life and property of nearly 1.5 million people living within a radius of 30 km. from the plant in case of an accident?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY): (a) No, Sir. The Reactor Pressure Vessel (RPV) of Kudankulam Nuclear Power Reactors employs state-of-the-art technology. The use of specific configuration of welded joints in the fabrication of Kudankulam reactor Pressure Vessel is consistent with existing practice and meets the laid down requirements of internationally accepted pressure vessel design codes.

The materials used in the forgings and welds of the RPV of Kudankulam Nuclear Power Reactors minimize radiation embrittlement. The robustness of these materials has been established by scientific and engineering tests. The design, materials and configuration of the RPV were approved by the regulatory authorities, both in the Russian Federation and in India (the Atomic Energy Regulatory Board) after extensive review.

(b) Does not arise.

**Uranium resources in the country**

628. SHRI PALVAI GOVARDHAN REDDY: Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that Andhra Pradesh has the highest uranium resources in the country;

(b) if so, the details thereof, district-wise;

(c) by when the above reserves have been discovered; and

(d) what efforts Atomic Minerals Directorate for Exploration and Research is making to explore the same?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY): (a) Yes, Sir. The survey and exploration for uranium carried