

**GOVERNMENT OF INDIA
ATOMIC ENERGY
LOK SABHA**

UNSTARRED QUESTION NO:2938
ANSWERED ON:30.07.2014
THORIUM RESERVES
Nayak Shri B.V.

Will the Minister of ATOMIC ENERGY be pleased to state:

- (a) whether India has large reserves of Thorium which can be used for electricity generation;
- (b) if so, the details thereof;
- (c) whether the Government has taken any step to tap this resource for electricity generation;
- (d) if so, the details thereof; and
- (e) if not, the reasons therefor?

Answer

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE
(DR. JITENDRA SINGH):

(a) & (b) Yes, Sir. India has an estimated reserves of Monazite of about 11.93 million tonnes (containing about 1.07 million tonnes of thorium metal) occurring in beach and river sands in association with other heavy minerals. Indian Monazite on an average contains about 9-10% of ThO₂.

(c) Yes, Sir.

(d) Indian Rare Earths Limited (IREL), a 100% owned Government of India Undertaking under the administrative control of the Department of Atomic Energy (DAE), is engaged in the mining and separation of beach sand minerals. IREL produces monazite in its plant at Manavalakurichi in Tamil Nadu, Chavara in Kerala and OSCOM in Odisha.

IREL has set up monazite processing plant at OSCOM, Odisha to process 10,000 tonnes of monazite per annum. Thorium is a by-product, along with rare earth chloride and tri- sodium phosphate as main product, from this plant.

Bhabha Atomic Research Centre (BARC) and other research organisations attached with DAE are engaged in various R&D activities to address the utilisation of thorium in different types of reactors. Some important highlights of these activities are the following :

(i) Thorium Oxide (Thoria) pellets contained in bundles have been used in the initial cores of our Pressurised Heavy Water Reactors (PHWRs). Thoria based fuels have also been irradiated in the research reactors CIRUS and Dhruva. After such irradiation these fuel elements have been examined in the laboratories at BARC, yielding excellent results.

(ii) The irradiated thoria pins of CIRUS have been reprocessed to obtain Uranium-233. The recovered Uranium-233 has been fabricated as fuel for the 30 Kilo Watt (thermal) KAMINI reactor, which is in operation at Indira Gandhi Centre for Atomic Research (IGCAR) at Kalpakkam.

(iii) The very challenging technologies for fabrication of Thoria based fuel pellets, carrying uranium-233, have been established.

(iv) The design of 300 MW Advanced Heavy Water Reactor (AHWR), using thorium based fuel, has been completed. This reactor will serve as a technology demonstrator for not only the thorium fuel cycle technologies, but also several advanced passive safety features. A Critical Facility for AHWR was commissioned in 2008 at BARC, and is used for carrying out experiments to further validate the physics design features of AHWR. A project for launching construction of AHWR has been included in the XII Plan.

(e) Does not arise in view of (d) above.