

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1758**  
TO BE ANSWERED ON 10.08.2011

**AVAILABILITY OF THORIUM**

1758. ADV. GANESHRAO DUDHGAONKAR:

Will the PRIME MINISTER be pleased to state:

- (a) whether sufficient quantity of thorium reserves are available in the country which has the potential to serve as feedstock for an ambitious nuclear power programme;
- (b) if so, the details thereof; and
- (c) the steps taken/proposed to be taken to extract thorium and utilize it for our nuclear power programme?

**ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND  
IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

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- (a) Yes, Sir.
- (b) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy has established 10.70 million tonnes of Monazite in the country, which contains 9,63,000 tonnes of Thorium Oxide (ThO<sub>2</sub>). Indian Monazite contains about 9-10% of ThO<sub>2</sub> and about 8,46,477 tonnes of Thorium Metal can be obtained from 9,63,000 tonnes of ThO<sub>2</sub> which will be used for future programmes of DAE.  
India is pursuing a three stage nuclear power generation programme aimed at long term energy independence based on use of our abundant Thorium resources. The programme is to use Thorium for electricity generation in the long-term. In order to realize this goal, we are well into the first stage based on our modest domestic Uranium resources. This will be followed by second stage comprising of fast reactors. It is proposed to set up a large power generation capacity based on fast reactors before getting into the third stage. Thorium in itself cannot produce electricity and it has to be first converted to

Uranium-233 in a nuclear reactor. A comprehensive three-stage nuclear power programme is therefore being implemented sequentially.

- (c) India has been working on the development of technologies for Utilisation of Thorium for Nuclear Power Generation since the inception of the Indian Nuclear Programme. As a part of this work, thorium has been irradiated in our Research Reactors and also in Pressurised Heavy Water Reactors. Technologies for reprocessing of irradiated thorium fuel for the separation of Uranium-233 have also been developed on a pilot plant scale. Uranium-233 thus separated has been used as fuel in research reactor Purnima-II and later in the 30 Kw Research Reactor Kamini now in operation at Indira Gandhi Centre for Atomic Research(IGCAR), a constituent Unit of the Department of Atomic Energy (DAE). Thorium based fuel has been manufactured and located in the Advanced Heavy Water Reactor (AHWR) critical facility for Reactor Physics experiments as well. Further development of technologies for large scale commercial level manufacture and reprocessing of Uranium-233 bearing fuel is underway.

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