

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
UNSTARRED QUESTION NO.3319
TO BE ANSWERED ON 12.02.2014

SETTING UP OF ATOMIC REACTORS

3319. SHRI HARSH VARDHAN:
SHRI RAO SAHEB DANVE PATIL:
SHRI HANSRAJ G. AHIR:
SHRIMATI SEEMA UPADHYAY:
SHRI A.T. NANA PATIL:

Will the PRIME MINISTER be pleased to state:

- (a) the details of the thorium reserves identified in the country, State-wise; and
- (b) the steps taken by the Government for exploitation of these thorium reserves and production of atomic energy using thorium?

ANSWER

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

- (a) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of Department of Atomic Energy (DAE), has so far established 11.93 million tonnes of monazite in the country, which contains about 1.07 million tonnes of thorium oxide (ThO₂). The state-wise resources of *in situ* monazite established by AMD as on December 2013 are as follows:

State	Monazite (Million tonnes)
Odisha	2.41
Andhra Pradesh	3.72
Tamil Nadu	2.46
Kerala	1.90
West Bengal	1.22
Jharkhand	0.22
Total	11.93

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- (b) The commercial exploitation of thorium deposits is carried out by Indian Rare Earths Limited (IREL), a Public Sector Undertaking of DAE. Since the year 1952, the IREL has been processing monazite and sufficient quantity of thorium has been stockpiled. Processing monazite to extract thorium is a continuous process. Aimed at long term energy security based on use of abundant Thorium resources, India's nuclear power programme is designed in three stages. In the first stage, electricity is generated using natural uranium fuel in Pressurised Heavy Water Reactors (PHWRs). In the second stage, spent fuel from PHWRs after further processing is used in Fast Breeder Reactors (FBRs). Thorium in itself cannot produce electricity and, in the later part of the second stage, when enough nuclear installed capacity has been reached, it has to be first converted to Uranium-233 in a FBR and then used in the third stage for generating electricity. As of now, India has entered into the second stage of the nuclear power programme and it has a long way to go to reach the third stage after successful operation of sufficient number of FBRs. Substantial work has been carried out in the areas of research on technologies for utilisation of thorium in nuclear fuel cycle, and the development of an Advanced Heavy Water Reactor (AHWR), to serve as a demonstrator for use of thorium based fuel on a large scale.
