The resources of xenotime, another rare-earth bearing mineral, are negligible in India. AMD has established about 2000 tonnes of xenotime-bearing heavy mineral concentrate containing 2% xenotime in the riverine heavy mineral placer deposits of Chhattisgarh and Jharkhand.

(c) Monazite is a mineral mainly containing rare earths and thorium-a prescribed substance to be handled by the Department of Atomic Energy (DAE). Accordingly, Indian Rare Earths Ltd. (IREL) wholly owned by the Government. of India, under the administrative control of the Deptt. of Atomic Energy (DAE) utilises monazite mainly for production of rare earth compounds, and thorium, as needed in the Department of Atomic Energy.

Dense population around Narora Atomic Power Plant

†468.SHRI VISHAMBHAR PRASAD NISHAD: Will the PRIME MINISTER be pleased to state:

(a) whether a study has found Narora Atomic Power Plant in high risk category due to dense population around the plant, if so, the details thereof; and

(b) the action plan Government proposes to chalk out in view of the findings of these study?

THE MINISTER OF STATE IN THE DEPARTMENT OF ATOMIC ENERGY (DR. JITENDRA SINGH): (a) No, Sir.

(b) Does not arise.

Thorium reserves in country

469. SHRI ANIL MADHAV DAVE: Will the PRIME MINISTER be pleased to state:

(a) whether India has reserves of thorium in sufficient quantity as compared to other parts of world:

(b) if so, the details of thorium reserves identified in India, its volume and estimated generation of power through these reserves;

(c) whether thorium as a fuel for power generation has more advantages than Uranium; and

(d) whether Government is considering promoting thorium based plants to overcome power crisis?

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†Original notice of the question was received in Hindi.

THE MINISTER OF STATE IN THE DEPARTMENT OF ATOMIC ENERGY (DR. JITENDRA SINGH): (a) Yes, Sir.

(b) and (c) 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 *in situ* resources Monazite (Thorium bearing mineral) in the country, which contains about 1.07 million tonnes of thorium. The State-wise resources of *in situ* monazite established by AMD as of September, 2014 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

Both Uranium and Thorium have got distinctive characteristics governing their utilisation in nuclear reactors. Unlike uranium, thorium alone cannot be directly used as nuclear fuel in a reactor. Utilisation of Thorium with either uranium or plutonium, without going through the second stage of Fast Breeder Reactors, to build sufficient inventory of plutonium first, will be counter-productive by limiting thorium utilisation to a very small fraction of the total available resources in the country. Utilisation of Thorium in the third stage makes it available as a sustainable energy resource for centuries. With this mode of utilisation, Thorium offers not only a sustainable energy resource, but also excellent fuel performance characteristic in a reactor, better than Uranium with respect to lower inventory of long lived nuclear waste.

(d) The three stage Indian nuclear programme was formulated at the inception of the DAE and has as its main stay objective of utilisation of large resources of Thorium in a sustainable manner. As explained above, Thorium cannot be used for overcoming power crisis in the short term.