GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
UNSTARRED QUESTION NO. 846
TO BE ANSWERED ON 26.06.2019

THORIUM-BASED NUCLEAR REACTORS

846. SHRIMATI RATHVA GITABEN VAJESINGBHAI :

Will the PRIME MINISTER be pleased to state:

(a) whether scientists have now started to experiment the power of other radioactive element such as thorium as a safer and cleaner energy source;

(b) if so, whether the thorium-based small nuclear reactors would be able to make the world free from its dependency on coal and natural gas;

(c) if so, the response of the Government thereto and whether Government is contemplating to use it; and

(d) if so, the time as well as the manner in which it is likely to be done?

ANSWER

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

(a) Yes, Sir. Department of Atomic Energy (DAE) has planned the use of large deposits of Thorium available in the country as a long-term option. A three-stage nuclear power programme has been chalked out to use Thorium as a viable and sustainable option, right at the inception of India's nuclear power programme. The three stage nuclear power programme aims to multiply the domestically available fissile resource through the use of natural Uranium in Pressurised Heavy Water Reactors, followed by use of Plutonium obtained from the spent fuel of Pressurised Heavy Water Reactors in Fast Breeder Reactors. Large scale use of Thorium will subsequently follow making use of the Uranium-233 that will be bred in Reactors. The utilisation of Thorium, as a practically inexhaustible energy source, has been contemplated during the third stage of the Indian Nuclear Programme. As is the case with generation of electricity from Uranium, there will be no emission of green house gases from Thorium also and therefore, it will be a clean source of energy.

(b) It is not possible to build a nuclear reactor using Thorium (Thorium-232) alone due to its physics characteristics. Thorium has to be converted to Uranium-233 in a reactor before it can be used as fuel.

(c) Development of technologies pertaining to utilisation of thorium has been a part of ongoing activities in Department of Atomic Energy. With sustained efforts over the years, India has gained experience in different areas of Thorium fuel cycle. Efforts are currently on to enlarge the present Thorium related R&D work and activities to a bigger scale and towards development of technologies for the third stage of our nuclear power programme. Safety has been accorded paramount importance in all Thorium technology development studies.

(d) Commercial utilisation of Thorium, on a significant scale can begin only when abundant supplies of either Uranium-233 or Plutonium resources are available. Accordingly, the large scale introduction and utilization of Thorium in the programme has been contemplated after an adequate inventory of Plutonium becomes available from our Fast Breeder Reactors (FBRs), comprising the second stage of Indian nuclear power programme. This will be after a few decades of large scale deployment of FBRs. In preparation for the utilisation of Thorium in Third Stage of India's Nuclear Power Programme, efforts towards technology development and demonstration are made now so that a mature technology for Thorium utilisation is available in time.

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