

# RAJYA SABHA

Thursday, the 11th August, 1988/20th  
Shravana, 1910 (Saka)

The House met at eleven of the Clock.  
MR. CHAIRMAN in the Chair.

## ORAL ANSWERS TO QUESTIONS

MR. CHAIRMAN: Question No. 221.

श्री राम अवधेश सिंह : मान्यवर,  
घर में तीन रोज से पानी नहीं आ  
रहा है। मैं नहाया नहीं। जब एम० पी०  
गो के घर में तीन-तीन दिन तक पानी  
नहीं हो तो आम जनता के आम लोगों  
घरों में प्रधान मंत्री कैसे पानी  
पूछायेगे?

श्री सभापति : नोटिस दिया आपने  
सवाल का ? ... (अवधान) ...

श्री राम अवधेश सिंह : नहाए हुए  
तीन दिन हो गए है। ... (अवधान)

MR. CHAIRMAN: All right. Question  
No. 221.

SHRIMATI VEENA VERMA: Sir,  
Question No. 221.

THE MINISTER OF STATE IN THE  
MINISTRY OF SCIENCE AND TECH-  
NOLOGY AND THE MINISTER OF  
STATE IN THE DEPARTMENTS OF  
SCIENCE, DEVELOPMENT, ATOMIC  
ENERGY, ELECTRONICS AND SPACE  
(SHRI K. R. NARAYANAN): Sir, (a) and  
(b): It is proposed to build a 500 MWe  
Prototype Fast Breeder Reactor (PFBR)  
by 2000 A.D. Successful commissioning of  
this reactor will be followed by construc-  
tion of a series... (Interruptions) ...

SHRI SWANT SINGH: Sir, we are  
not able to hear anything... (Interrup-  
tions) ...

SHRI N. E. BALARAM: Sir, we are  
not able to hear what the Minister is read-  
ing out... (Interruptions) ... We are not  
able to hear him... (Interruptions) ...

MR. CHAIRMAN: Mr. Minister, kindly  
speak near the mike... (Interruptions) ...

Kindly speak into the mike. Kindly speak  
into the mike because the Members say  
that they are not able to follow you. So,  
Please speak near the mike.

SHRI K. R. NARAYANAN: Sir, they  
cannot hear if they talk... (Interruptions)  
... I am prepared to read it out again.  
But if they talk, they will not be able to  
hear. I will read it again.

## Building of fast breeder reactors

\*221. SHRIMATI VEENA VERMA:†  
SHRI KAPIL VERMA:

Will the PRIME MINISTER be pleased  
to state:

(a) the details of the plans to build fast  
breeder reactors;

(b) by when these are likely to be estab-  
lished and at what cost;

(c) the fuel which is likely to be used  
in these reactors and from where it is  
likely to be obtained; and

(d) what will be the number of such  
reactors?

THE MINISTER OF STATE IN THE  
MINISTRY OF SCIENCE AND TECH-  
NOLOGY AND THE MINISTER OF  
STATE IN THE DEPARTMENTS OF  
OCEAN DEVELOPMENT, ATOMIC  
ENERGY, ELECTRONICS AND SPACE  
(SHRI K. R. NARAYANAN): (a) and (b)  
It is proposed to build a 500 MWe Proto-  
type Fast Breeder Reactor (PFBR) by 2000  
AD. Successful commissioning of this reac-  
tor will be followed by construction of a  
series of reactors of similar capacity. The  
cost of construction has not been finalised.

(c) Fuel for these reactors will be ob-  
tained by reprocessing irradiated uranium  
discharged from the Pressurised Heavy  
Water Reactors (i.e. spent fuel from these  
reactors) and by recovering plutonium  
bred in the fast breeder reactor itself.

†The question was actually asked on the  
floor of the House by Shrimati Veena  
Verma.

(d) It is premature to arrive at the number of such reactors to be built in future.

**SHRIMATI VEENA VERMA:** Mr. Chairman, Sir, I welcome the Fast Breeder Reactor Programme outlined by the Government.

Fast Breeder has been taken so far as the best bet for producing cheap nuclear energy. But our experience of India's first Fast Breeder Reactor at Kalpakkam has not been encouraging. The big project was set up in 1971. The Fast Breeder Test Reactor attained criticality probably in 1985. But the teething problems are not over even now and the reactor is still not operational. I want to know whether the technical problems faced at Kalpakkam can be solved. Can the Minister indicate a firm date by which this reactor will start functioning because the indications of time given so far have proved elusive? Sir, I also want to know what impact the Kalpakkam problems will have on the programme of Fast Breeder Reactors announced by the Minister just now.

**SHRI K. R. NARAYANAN:** Sir, it is a test reactor which has had teething problems and also the problems of getting fuel. In the beginning, France had promised fuel. But after 1974 they had difficulties in giving that fuel to us. Therefore, we had to develop a fuel of our own. This is called mixed carbide. These are basically the reasons for the delay in the Fast Breeder Reactor Programme.

**SHRIMATI VEENA VERMA:** I would like to know whether the Fast Breeder Reactors will be more dangerous to environment and human life in case of accidents taking place in the nuclear plants. I would also like to know whether the Government has given its final approval to the acquisition of two 1000 MW pressurised light water reactors offered by the Soviets. If so, what will be the exact nature of safeguards agreed to by the Government? Will they be full-scope safeguards or will they be limited in nature?

**SHRI K. R. NARAYANAN:** Sir, about the possible threat to environment from the Fast Breeder Reactor, I understand

that due to technological reasons the radiation threat posed by Fast Breeder Reactor would be much less than by pressurised heavy water reactors. This is because of two or three reasons. One is that the coolant that will be used in the Fast Breeder Reactor is sodium coolant which has a very high boiling point. Therefore, there is less danger of any leakage taking place. The second reason is that in respect of neutron flux which creates radioactivity there is an internal technology provision for shielding in the Fast Breeder Reactor which will absorb more of the neutrons. Therefore, for that reason also, the threat of radio-activity being released into the background is much less. There is one more technological reason which is in the perspective of the future. It is a new fuel which is being developed. It is inherently safer than the fuel we have. It is a metallic alloy of Plutonium and uranium on which we are working.

I think the Russian offer is not a part of this question. But I can tell you very briefly that the Russian offer is still under the consideration of the Government and a final decision has not yet been taken.

**SHRI KAPIL VERMA:** I want to know whether the Government has taken any lessons from the experience of the French who have been most successful in developing fuel for the supersonic reactor. What is the Government's assessment of it? Recently, the French have been having serious problems about their own Fast Breeder Reactors. I also want to know what is the impact on Government's thinking of the report that the Chief Scientific Adviser of the British Cabinet has said saying that the Fast Breeder Programme has no short-term commercial potential. The most important question that I want to ask is this. By what time will the Government be able to establish this new nuclear technique for commercial use? Sir, plutonium will be used as fuel for the fast breeder reactor. But we have seen serious allegations in the western press that India has been stock-piling plutonium for nuclear bombs and that we have been importing heavy water in a clandestine manner. Of course, it is absolutely wrong. Has the

Government reacted to it? Have they made any statement denying it? If not, I think they should use this opportunity to deny it.

**SHRI K. R. NARAYANAN:** Sir, let me first of all deal with the question of denial. I would humbly request the hon. member not to give credence to reports appearing in the western press. We all know the facts. We have a peaceful nuclear programme and we stick to it unless, of course, some emergency over-whelms us.

With regard to the viability of fast breeder programmes, it is a new technology. It is still a developing technology. Not only in France, but in the United States, in Britain, in the Soviet Union and in Japan Fast Breeder Reactors have been built and they are functioning. I am not aware of any basic problems with regard to the French programme. In fact, the French had supplied us some technology with regard to the components for our fast breeder programme.

**SHRI KAPIL VERMA:** There are serious problems. It is all over in the press.

**PROF. C. LAKSHMANNA:** Mr. Chairman, Sir, the Minister stated that by 2000 AD there is a possibility of a successful launch. I would like to know how you could be sure of 2000 AD. Firstly, we have been depending on the supply of fuel by the French which they have denied us. Secondly, we have been making our own efforts to develop fuel. As has been stated by the Minister in his reply and also in reply to the supplementaries and as the information is also tickling down, we are in a position to know exactly about the preparation of fuel. Therefore, I would like to know what is the basis for the optimism of 2000 AD for making this programme successful.

**SHRI K. R. NARAYANAN:** The main basis of optimism is that we have already succeeded in developing an alternative fuel what is called 'mixed carbide', a mixture of plutonium and uranium. This has been tested and accepted as a viable fuel. Therefore, we would be completely self-reliant with regard to this fuel question. In fact,

we are also going into other possible fuels like mixed nitrate coolant or what is called metallic alloy fuel. On this also we are doing research. We have with us the mixed carbide.

**SHRI VISHWA BANDHU GUPTA:** Mr. Chairman, Sir, I am happy that this fast breeder programme is being taken up by the Government. I would like to ask the hon. Minister whether the facility of this fast breeder reactor would be available to other research labs for doing research of fundamental particles and whether this will also help our programme of fusion and research of fusion as a source for power.

**SHRI K. R. NARAYANAN:** Research facilities will be available to other labs in the field. But as regards fusion, it is a scientific question. I am not aware of it. I don't think it is directly related to fusion technology. I would like to have notice.

**SHRI SUBRAMANIAN SWAMY:** Sir, the original fast breeder programme was to be integrated ultimately to the use of thorium needed in our nuclear programme, and therefore, to make India self-reliant because 80 per cent of the deposits of thorium are in India. Sir, since the target set at 1980 by Dr. Homi Bhabha is no more attainable—he is no more and he is not in the scene—I want to know whether the Government has any programme or target for the utilisation of thorium through this technology.

**SHRI K. R. NARAYANAN:** Yes, we have started before that. As you know, this fast breeder technology is the second stage of our nuclear programme. The third stage will be the thorium-based nuclear programme. That, I am afraid, is a little far away, after we get into this.

**SHRI SUBRAMANIAN SWAMY:** How far away?

**SHRI K. R. NARAYANAN:** Maybe...

**SHRI SUBRAMANIAN SWAMY:** 22nd century?

**SHRI K. R. NARAYANAN:** Certainly 21st century because this Fast Breeder Reactor itself is a 21st century thing. And maybe by the middle of the next century we may be fully using thorium as a base. By that time, our calculation is—that of Dr. Homi Bhabha—that our known resources of uranium would have run out and we would need to tackle thorium for getting fissionable material.

**SHRI RAOOF VALIULLAH:** Sir, the hon. Minister has stated that prototype fast breeder unit of 500 MW size is currently under design at the Indira Gandhi Centre for Nuclear Research at Kalpakkam, Tamil Nadu, which is expected to be commissioned by the turn of the century. I would like to know from the hon. Minister whether it is an indigenous programme or with the Soviet assistance and whether Indian scientists could fabricate reactors of indigenous design and, secondly, whether generation of electricity from the nuclear fission process is safe, reliable and economic and efficient and, if so, what is the cost per unit of energy produced at the nuclear station and that produced at the thermal power station.

**SHRI K. R. NARAYANAN:** First of all, Sir, the fast breeder reactor or what we call the prototype fast breeder reactor is a completely indigenous programme. The construction will begin by 1990-91 and will be completed by 2000 AD. We have already asked some of the Indian industrial manufacturing firms to go ahead with manufacturing some of the basic components. Therefore, the work is going on not only with regard to research but also in regard to getting components and other equipment. Orders have been placed on our industrial firms. Secondly, Sir, about the cost of electricity in the beginning, I am afraid, it would be costlier than other reactors naturally because it is a high technology field, a very complex technology. And until we go into a fairly large-scale production, cost would not come down. But this cost we have to bear for the sake of our technological advance and also for having sources of energy when the other known resources might run out. Of course, I can give the

cost of electricity produced from the pressurised heavy reactor in relation to coal-based electricity, 30 to 44.6 paise per unit is the present price of electricity produced from nuclear plants while that of thermal is 37.41 to 61.55 paise. In fact, in certain cases, compared to coal-based thermal plants which are far away from the pit-head, the nuclear energy today is cheaper. With regard to hydel, of course, there is no comparison. Hydel is much cheaper. But the cost of building is much greater and it has also many large-scale environmental repercussion.

**SHRI JASWANT SINGH:** Mr. Chairman, Sir, I have two clarifications to seek, Sir, most of the plutonium that we are using in our FBTR, to my information, comes from our own sources. Now, what is the status of this fuel? Is it IAEA safeguarded? Secondly, is it correct that the FBTR at Kalpakkam will, in fact, use more plutonium than produce it up to almost 1992? Sir, the second clarification that I seek relates to heavy water. We have six heavy water plants of which Talcher is shut down since April 1987. Now, between Kota Tuticorin, Thal and Baroda we produce roughly 390 to 400 tonnes, that is the built-in capacity. But it is also known that we have a shortfall between capacity and production. In 1986-87, for instance, it was roughly 60 to 70 tonnes. One is, therefore, to consider how are we meeting the shortfall of heavy water programme, because without these two the entire FBTR programme will suffer.

**SHRI K. R. NARAYANAN:** Sir, with regard to plutonium reprocessing for the fast breeder reactors, we will be producing sufficient reprocessed plutonium from the Kalpakkam plant itself. That would be sufficient for fuelling the fast breeder reactor which would be built up, whether at Kalpakkam or somewhere else. With regard to safeguards of course, the Tarapur reprocessing plant is under safeguards. But the one at Kalpakkam is not under safeguards. Therefore the plutonium which we get from there, we are free to use for our own purposes in our own way. With regard to heavy water, Sir, we import, under an agreement with the Soviet Union, the heavy water required for the

Rajasthan nuclear plant. Apart from this, we produce enough heavy water for all our nuclear plants and we are self-sufficient in that respect. (*Interruptions*).

MR. CHAIRMAN: Yes, Mr. Jadhav.

SHRI VITHALRAO MADHAVRAO JADHAV: Mr. Chairman, Sir, Kalpakam is a totally indigenously built reactor. Likewise, the Dhruva reactor at Bombay, which is also a research reactor. May I ask through you the hon. Minister that the fuel which is produced there at Kalpakam and Dhruva reactors will be sufficient for the generation of 10,000 M.W. of power through atomic energy by 2000 A.D.? This is my first question. My second question is whether there are any proposals from the Government of Maharashtra to establish atomic power plants in Maharashtra. I think I have learnt that three projects have been submitted to the Government of India. I would like to know what decision has been taken on them.

SHRI K. R. NARAYANAN: Sir, with regard to future nuclear plants, selection of sites, a Site Selection Committee has reported on it and this report is under the consideration of the Government. The Government has not yet decided upon where sites of the future plants will be.

SHRI VITHALRAO MADHAVRAO JADHAV: When a decision be taken?

SHRI K. R. NARAYANAN: I cannot forecast now. But this is under the consideration of the Government. With regard to fuel, Sir, up to 2000 A.D. there is no question of using the reprocessed plutonium. We will be depending upon our pressurised heavy water reactors run by natural uranium with heavy water. And we need only uranium resources. We have enough uranium resources for fuelling these plants and the plants which we are going to set up upto 1990 or 1995 for reaching the target of 10,000 M.W. electricity by 2000 A.D.

SHRI E. BALANANDAN: Sir, it is reported in the press that our nuclear energy programme needs to be toned

down because of financial constraints. Will the Minister be kind enough to say whether it is true? I want to know also whether the Government of Kerala has requested to establish a nuclear power plant in the State and the Government of India is considering that. What is the position today? Will the Minister explain that too?

SHRI K. R. NARAYANAN: Sir, there is certainly financial constraint. But in order to overcome this financial constraint we have set up the Nuclear Power corporation which is free now to raise money from the open market. In fact, they floated bonds which have been over-subscribed already.

For the 10,000 MW target, we would need about Rs. 14,000 crores which would be met by the Corporation and also naturally some funds coming from the Government itself. So we feel that it is a feasible programme financially as well as technologically.

About setting up a nuclear power station in Kerala, it comes under the same category as in the case of Maharashtra which was referred to earlier. As I had said, it is under the consideration of the Government. I cannot forecast what the decision would be.

MR. CHAIRMAN: Next question.

**River basin study by the Institute of Water Studies Taramani**

\*222. SHRI V. GOPALSAMY:†  
SHRI T. R. BALU:

Will the Minister of WATER RESOURCES be pleased to state:

(a) whether it is a fact that the river basins are being studied in depth by the Institute of Water Studies Taramani;

(b) if so, what are the details in this regard;

(c) whether agriculture experts from the Centre and States are likely to be

†The question was actually asked on the floor of the House by Shri V. Gopal-samy.