

"Reactors put under safeguards should get fuel from the international market"

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Interviews

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Anil Kakodkar, Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy, says the eight indigenous Pressurised Heavy Water Reactors (PHWRs) that India will put under safeguards should get natural uranium as fuel from outside.
Excerpts from an interview on March 12 in Mumbai:

Anil Kakodkar: "The safeguard arrangements of India will not be of the type which are applicable to the NPT states."

What is the significance of India insisting that its Fast Breeder Test Reactor (FBTR) and the Prototype Fast Breeder Reactor (PFBR) at Kalpakkam should not come under safeguards?

The development of Fast Breeder Reactor technology and the development of its associated fuel cycle technology have to go hand in hand because breeders have to operate in a closed cycle mode. In the development of breeders, we have to go through evolution of several fuel cycle technologies, not one. For example, the PFBR will initially be on the mixed oxide fuel system. We will have to reprocess and re-fabricate the mixed oxide fuel. Then we want to take it to the next stage of development where we have to develop the metallic fuel. We then have to talk about the fuel cycle for metallic fuel. Later about the thorium fuel cycle. So there is an intimate link between the development of FBR technology and the development of associated reprocessing and refabrication technology. Our infrastructure for fuel cycle activities are rather small now. That is also intimately linked to the strategic programme. So the PFBR and the FBTR cannot be brought under safeguards because they are closely associated with the strategic programme through the fuel cycle linkage.

The United States insisted that we should put the PFBR and the FBTR under safeguards. How did it give in?

We had made our position quite clear on this right from the beginning, even soon after the July 18, 2005, Joint Statement [by Prime Minister Manmohan Singh and President George Bush]. It was a logical position. In fact, there was no way it could have been compromised. I am glad we finally reached an agreement.

If everything falls in place, the U.S. adjusts its domestic laws and the Nuclear Suppliers' Group changes its guidelines to sell light water reactors (LWRs), enriched uranium and natural uranium to India, where do we go from here?

We have an on-going programme and that will continue as planned. In our programme, we also have kept a place for imported light water reactors as additionalities. Now there is a chance that this objective can be realised. If all goes well, we can even hope to have a much larger capacity of LWRs compared to what we had planned earlier.

What will be the capacity?

In the programme of 20,000 MWe of nuclear power by 2020, we had provided 8,000 MWe of LWRs capacity. Hopefully, that can be realised now and perhaps even a larger capacity.

Where do we stand now in terms of building of reactors and the supply of fuel?

The domestic programme will continue. That means, we will continue with the construction of the PHWRs and the FBRs. Right now, we are constructing five PHWRs, one PFBR, and two LWRs. We also have to take up construction of more PHWRs as part of the pre-defined programme. After we are nearly complete with the PFBR, we will take up construction of more FBRs.

The construction of the 300 MWe Advanced Heavy Water Reactor (AHWR), which will use thorium as fuel marking the third stage of our nuclear power programme, has been delayed by three years. Why?

Since the AHWR has an innovative design, we wanted to make sure that it is peer reviewed by another group other than the group which designed it. That has been done. We also wanted pre-license regulatory review. The Atomic Energy Regulatory Board is in the process of carrying it out. Once that review is completed, it will be time for us to approach the Government for approval for construction of the project. It may still happen by the end of this year or next year. It is better to be sure of the design and safety in advance.

How will the separation of civilian nuclear facilities from their military counterparts affect the DAE's organisational structure?

There is no change in the structure. We are identifying specific plants as civilian and they will be put under safeguards. Laboratories like BARC [Bhabha Atomic Research Centre] will be obviously on the strategic side. Like that, facility by facility is identified. There is no need for any change in the organisational structure. This obtains in all countries. Only one Government department looks after the entire atomic energy activity.

What will be the cost of the separation?

It is difficult to exactly quantify. Our programme is not at a standstill. As our programme grows, we have to expand our facilities. New facilities will have to be added. It will be our choice to define tomorrow which of the future facilities will be on the civilian side and that will be India's sole determination. You are talking about additional costs. If the programme is static and you have to separate, then you will have to build duplicate facilities. If the programme is growing, you can build additional facilities to meet the growth requirements. Whatever capacity we are setting up will be fully utilised at all times. To that extent, additional costs will be contained... There will be some costs. But I will imagine that it will not be excessive particularly because we are going to implement the separation plan in a phased manner over a period of time.

Why are we retiring CIRUS? It was refurbished only recently. Are we shutting it down because there were allegations that the plutonium for the 1974 Pokhran nuclear explosion came from CIRUS?

CIRUS has all along been a facility to support research for peaceful applications of atomic energy. As per our understanding of the July 18 Joint Statement, it has to be on the civilian side and placed under safeguards. But we cannot do that because it is located on BARC. And BARC is a strategic facility where we cannot allow external inspections. So it is a logical decision to complete the on-going research programme in CIRUS and shut it down in 2010.

Will we build more research reactors?

We always have plans to build more research reactors... Sometime ago, we had plans to build a multipurpose research reactor. Similar newer ideas may come on the horizon. We have to think of new facilities. Research reactors are used for a variety of purposes. Production of plutonium [for strategic purposes] is only one aspect. Dhruva is a high-power reactor. We have several other reactors of smaller power, which support research activities. In that sense, Dhruva is an important system for both research and plutonium for strategic programmes...

Supposing we get natural uranium for the PHWRs we are building now or plan to in the future, will you put those reactors under safeguards?

Yes. I will put it this way. The reactors that we put under safeguards should get fuel from the international market.

Otherwise, you are not prepared to put them under safeguards?

The point is that any reactor put under safeguards should become eligible for full, civil cooperation, which means it also becomes eligible for external fuel supply. In the international market, natural uranium is cheap. If we get that natural uranium, electricity tariff will come down.

So will we insist that the eight PHWRs which we will put under safeguards or the future PHWRs that we will put under safeguards should get natural uranium from outside?

Yes. That is the understanding...

What is the sanctity of the dates "between 2006 and 2014" when we will put eight PHWRs under safeguards?

We have to do a lot of preparation. That is why we have said the separation will be done in a phased manner. The time indicates the duration for the phased manner.

Why did we agree to put our reactors under permanent safeguards? Why did we not insist that we should have a right to shift them from the civilian to the military domain?

We are outside the NPT [Non-Proliferation Treaty]. Certainly, therefore, safeguard arrangements of India will not be of the type which are applicable to the NPT States. We

are a country with nuclear weapons and that has been accepted. 'Nuclear weapon states' is NPT terminology. As far as we are concerned, we have to have our own India-specific safeguards. What has been done now is to ensure that the fuel supply for reactors placed under safeguards will be available for their full operating life. In that sense, we are talking about permanent fuel supply assurances. As long as fuel supply is permanent, there should be no problem in permanent safeguards... The new arrangement visualises several assurances to ensure that disruptions do not occur. That includes stockpiling for the full life of the reactor. There will also be a provision to take corrective measures if at all disruption takes place. It is a good practical arrangement.

The nuclear separation agreement talks about India-specific safeguards. What are they?

Our safeguards agreement cannot be like that of any NPT country. They are India-specific arrangements, recognising the fact that India has a nuclear weapon programme.

Ratan Tata has shown interest in private sector participation in building nuclear power projects. Will you welcome private participation?

Yes. But it has to be a specific proposal and it should lead to a larger capacity addition over and above what can be done with the present arrangements.

What is the basis for selecting Madras Atomic Power Station 1 & 2 reactors and Tarapur 3 & 4 reactors for exclusion from safeguards?

We need [a] certain minimum capacity for our strategic programme. So they will not come under safeguards.

Why did we choose to put the heavy water plants on our own at Tuticorin, Thal and Hazira under safeguards when it is not necessary to do so?

Civilian heavy water reactors can be fed from civilian heavy water plants. The strategic heavy water reactors can be fed by strategic heavy water reactors... Heavy water plants should also be eligible for international cooperation if they are in the civilian domain.