nical data banks to provide technical information to rural entrepreneurs and agro-based entrepreneurs so that we can take technology back to rural India and help implement ideas better.

SHRI K. R. NARAYANAN: Sir, I think that is a question which falls within the purview of the Indian Council of Agricultural Research. Generally speaking, I think this is an area in which the Government is interested in collecting and providing information and statistics.

SHRI RAJIV GANDHI: Sir, may I just add to that? One of our biggest thrusts and achievements has been in taking very high technology to the rural areas and that is why we have made such a success in our food growing programmes. The technology that is now available with our farmers in terms of seeds, the research work that is backing the seed and other technologies is equal to any in the world.

SHRI ATAL BIHARI VAJPAYEE: Question No. 143.

SHRI K. R. NARAYANAN: Sir,..

MR. CHAIRMAN: Mr. Narayanan, long answers should be placed on the Table of the House. Hereafter let your Department take note of it.

SHRI K. R. NARAYANAN: Sir, a statsement is placed on the Table of the House.

SHRI ATAL BIHARI VAJPAYEE: Sir, there is no statement.. *(Interruptions)* We have not received a copy of it.

MR. CHAIRMAN: Mr. Narayanan, please read the answer to Question No. 143. It is a long statement and so I suggested that hereafter you must place long answers on the Table of the House. But now you read it.

SHRI K. R. NARAYANAN: May I read it, Sir?

MR. CHAIRMAN: Yes, you have to.

*The question was actually asked on the floor of the House by Shri Atal Bihari Vajpayee.

Capital and Operational cost in Nuclear power stations

*143. SHRI ATAL BIHARI VAJPAYEE: †
SHRI ASHWANI KUMAR:

Will the PRIME MINISTER be pleased to state:

(a) what is the capital cost and the operational cost per Kw. in the nuclear power stations at Tarapur, Rajasthan, Kalpakam and the estimated ones in Narora;

(b) in what manner they compare with their averages in the thermal and hydel power stations; and

(c) whether there has been a steep rise in the capital cost and operational cost in the nuclear power stations; if so, what is Government's thinking regarding installation of new nuclear power stations in future?

THE MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGIES AND MINISTER OF STATE IN THE DEPARTMENTS OF OCEAN DEVELOPMENT, ATOMIC ENERGY ELECTRONICS AND SPACE (SHRI K. R. NARAYANAN): (a) Capital cost|Kwe installed for Nuclear Power Stations at Tarapur, Rajasthan, Madras and Narora, is Rs. 2247, Rs. 3996, Rs. 5231 and Rs. 11444 respectively. The unit energy cost is 36.99 paise|Kwh for Tarapur, 35.49 Paise|Kwh for Rajasthan and 43.03 Paise|Kwh for Madras Atomic Power Stations. The estimated unit energy price for Narora is about 71 Paise|Kwh.

(b) The capital cost|Kwe installed of Power Stations to be commissioned in the year 1992 is estimated to be Rs. 15,400 for Nuclear, and Rs 14,790 for Thermal Power Stations respectively. Nuclear power at the selected sites is cheaper than electricity generated depending on the locations and those of the recent stations at Dul Hasti, Chamera II, Nathapajahkri, Uni Poonch vary from Rs. 10,760 to 13,280 per Kwe. The operating costs of hydel stations are naturally low and in comparison with operating costs of thermal and nuclear units would not be appropriate.

(c) There has been a rise in the capital and unit energy costs of power from nuclear, which is of an order similar to the rise in the case of power from thermal and other sources. In view of the energy needs of the country, Government considers it desirable to exploit all available and feasible sources of power including hydel, thermal and nuclear.

श्री अटल बिहारी वाजपेयी : सभापति जी, वक्तव्य में यह स्वीकार किया गया है कि एटम से बनने वाली बिजली की तुलना में पानी से तैयार होने वाली बिजली सस्ती पड़ती है। लेकिन मंत्री महोदय का कहना है कि तुलना करने की आवश्यकता नहीं है। मैं यह समझने में असमर्थ हू कि इसमें तुलना क्यों नहीं की जानी चाहिए। अगर पानी से बिजली बनाना सस्ता है और हिमाचल जैसे प्रदेश में पानी से बिजली बनाने की परिस्थितियां उपलब्ध हैं तो पानी से बिजली बनाने को हम प्राथमिकता क्यों नहीं दे रहे हैं ? मंत्री महोदय जरा इस पर प्रकाश डालें।

SHRI K. R. NARAYANAN: Sir, I said, it need not be compared because obviously and demonstrably the price of hydro-electricity is less. I can give you the figures. It ranges from 2.6 paise unit cost per kw. hour to 4.80 paise. And the capital cost, of course, is not as cheap, it is almost on a par.

First of all, may I say that it is our policy to develop hydel power to the maximum extent possible. We are thinking of a mix of thermal, hydel and nuclear power and indeed all other sources of power like solar, wind, wave and other kinds of new energy. There are some problems with regard to hydel power. Though we have great rasources of hydel electricity, there are questions of environment, questions of submerging land or submerging forests etc. involved in developing hydel power. Therefore, this places a certain constraint. And taking into account all aspects, social, environmental, cost and other aspects, while we should develop and we are developing hydel power, we have to think of satisfying the overall needs of the country by having nuclear power also.

SHRI ATAL BIHARI VAJPAYEE: After the accident in Chernobyl, the safety of the atomic power stations and the safety of the people should be given the highest priority. But in our country, unfortunately, there is a competition among States to secure more and more power stations as if the power station has become a status symbol. I would like to know whether the Prime Minister has given any thought to this matter and whether this question is being discussed with the concerned State Governments.

SHRI RAJIV GANDHI: Sir, I will definitely discuss with the Ministers the fact that power stations are becoming status symbols with the State Governments.

SHRI ATAL BIHARI VAJPAYEE: I expected a more serious reply. It is not a matter to be joked about. He is the Minister in charge of Atomic Energy. After the Chernobyl accident the people are to be made aware of the dangers of accidents in power station.

SHRI RAJIV GANDHI: Sir, I answered the question that was put to me. I do believe that a second question has not been put.

MR. CHAIRMAN: You said in the course of your question, "Will the Prime Minister say whether he would discuss it with the States." Therefore, he confined his answer to that question. The other question may be answered by Mr. Narayanan, whether you have considered the possibilities of leakage and all that.

SHRI K. R. NARAYANAN: Yes, Sir. The safety of the atomic power reactors is one of the foremost considerations in our mind. But may I first of all say that until the Chernobyl accident there had been no fatalities in a power ractor as a result of atomci radiation. his is one of the major accidents. Of course, the Three Mile Island acci-

dent took place. But if you consider the fatality in atomic reactors, they have been less than, if I may say so, in coal mines. More people have died in coal-mines than they have died due to atomic reactor fatalities. But we are nevertheless alive to the health of the people which is of utmost importance and we have taken safety measures at three levels. First of all at the level of the designing and construction of the reactor itself. We have incorporated all the modern safety features in this. I can explain it, but I think it is not necessary. Secondly, for the safety of the people who are working in the reactors and around it, we have taken all possible precautions. Thirdly, we are thinking of off-site accidents which might involve the community as a whole. For this also be have taken measures like first of all having an exclusion zone of 1.6 kilometres; then what we call as sterlized zone of five kilometres, and above all the design and construction of the reactor is such that with the double containment with the other major shut down facilities, storing of water, what we call redundancy, additional water pump additional shut down facilities. With all these precautionary measures we have incorporated into an atomic reactor we feel that the possibility of an accident is rather remote. Besides, our reactors have greater safety measures than was present in the Chernobyl reactor which was of a different type.

Yesterday the Prime Minister, of course, had mentioned in the other House that he would like a discussion on the subject of the measures we should take in case of the unlikely event of a calamity with regard to a reactor. This is a legitimate question to be discussed and I think we have to think of other measures. Apart from the technical things we have done, communication systems are being established in the reactors with buses and transport system for evacuation, storage of water within as well as in the vicinity of the reactor and also getting...

MR. CHAIRMAN: We do not anticipate all these in the supplementaries. Please sit down.

SHRI A. G. KULKARNI: That is the difficulty with the diplomats.

श्री अश्विनी कुमार : माननीय सभापति महोदय, अभी बताया गया कि हाइडल पावर में बहुत सारी समस्याएं हैं, बहुत सारी जमीन वगैरह लेनी पड़ती है। लेकिन जो बेस्ट-फेक्टर है, तीनों का लगभग बराबर है—हाइडल, थर्मल और न्यूक्लीयर का इंस्टालेशन कॉस्ट। रनिंग कोस्ट में इतना अन्तर है कि जहां .71 पैसे और 4 पैसे का अन्तर है। जहां तक हेज़ारड्स का प्रश्न है, वहां जमीन लेने का प्रश्न है, तो अटोमिक पावर स्टेशन के बारे में आज सारी दुनियां में चर्चा हो रही है कि जब वे बंद कर दिए जाएंगे, जब उनकी आयु खत्म हो जाएगी, तो फिर इनका क्या किया जायेगा, कहां उनको डिसपोज-ऑफ किया जावेगा? यह समस्या, जो बहुत बड़े-बड़े न्यूक्लीयर पावर स्टेशन हैं, उनके सामने भी आ गयी है। हर साल जो पावर स्टेशन बन्द होते जाएगें, क्या वह न्यूक्लीयर टोम्ब बनेंगे, न्यूक्लीयर पिरामिड बनेंगे, जो कि भविष्य की पीढ़ी के लिए खतरा बनेंगे? उनका इतना ज्यादा खतरा है और माननीय मंत्री जी कहते हैं कि उनका कोई खतरा नहीं है। थर्मल पावर के अन्दर, जो थर्मल पावर स्टेशन हैं, उनके पास तीन-चार पांच किलोमीटर के अन्दर जो लोग रहते है, क्योंकि उनमें इतना कोयला झोंका जाता है, जिससे उनको सांस लेने से कई बीमारियां रहती हैं। कोयला खदानों में क्या है? मैं मंत्री महोदय से जानना चाहूंगा कि जब हेज़ारड्स बराबर है, इनिशियल कोस्ट बराबर है, रनिंग कोस्ट कम है तो क्या वे न्यूक्लीयर की ओर कम ध्यान देकर और हाइडल को अत्यधिक महत्व देकर सबसे ज्यादा एलोटमेण्ट हाइडल के लिए करने का प्रयास करेंगे क्या?

MR. CHAIRMAN: In fact the hon. Minister in his exhaustive answer had anticipated all these things.

SHRI K. R. NARAYANAN: Hydel power is not given less importance. As I said we propose to exploit the hydel energy resources available within the country to the maximum extent possible. but as I said we have to bear in mind some of the consequences. It is within this constraint that we can develop hydel power. I know that there is a question of unreliability with regard to hydel power. Sir, I come from the Kerala State and I know that during the last one year, how electricity has failed from the big hydel schemes, we have built up in Kerala because of drought. We must take into account all these things and for meeting the total needs of the country, we must develop alternative sources of energy. As I said, not only nuclear source, but even solar and other sources of power for meeting the immense developmental needs of our country.

SHRI SURESH KALMADI: Sir, the Department of Atomic Energy has stated that 10,000 MW of power by 2,000 will cost about Rs. 15,000 crores. I would like to know from the Minister whether he is sticking to the figure of Rs. 15,000 crores? You can see, Sir, the answer given by the Minister shows the costs have gone right from Tarapur to Narora and Kakrapar. For example, construction costs have gone up from Rs 200 crores and Rs. 300 crores to Rs. 500 crores and Rs. 600 crores. Even the heavy water is also Rs. 1 crore nearly per tonne. The delay in implementation is mainly responsible for cost escalation. The Madras atomic power plant was supposed to cost about Rs. 65—70 crores and it has gone up to Rs. 200 crores. Even the power plant No. 2 was shut up for three times. So in view of all these factors, I want to know from the Minister whether the figure of Rs. 15,000 crores continues? Whether he has taken into account the hidden costs involved while calculating the capital cost? We all know that gestation period of a power plant is about five years and its life span is about 25 years. After 25 years or so, the Tarapur plant has to be dismantled. While dismantling the cost of prevention of radio activity, etc., the cost works out to as much as constructing a power plant. So in view of this, I would like to know, whether the hidden capital cost is also included? What is your return on investment?

SHRI K. R. NARAYANAN: I think we have anticipated this Rs. 15,000 crores and we stick to that figure. I am not saying that price rice and other factors would not occur. It has happened not only with the atomic projects but with every project. But there are ways in which we can economise. First of all, we have concentrated on standardisation of the reactors. Let us not forget that we have been experimenting and developing in a very new and unkonwn field of technology without the support of the rest of the world, more or less when they have imposed an embargo in giving us equipment and technology. Therefore, there had been many teething troubles. By standardising our reactors, we have succeeded in doing so with regard to 235 MW reactor. We might do so, with regard to 500 MW also. This will bring down the cost. As you have said elimination of delays by better planning, advance storage of equipment and all that. This is the experimental stage through which we have passed and we have learnt many lessons and. I think, we would be able to shorten the period of constructing a reactor in the future. This will save...

SHRI SUKOMAL SEN: Sir, my question is about the future programme. I would like to know from the hon. Minister whether the Government is contemplating to install any other new nuclear power stations in the country besides those which we have already? If so, which are the places that have been selected for the nuclear power stations?

MR. CHAIRMAN: Future programme.

SHRI K. R. NARAYANAN: Yes, Sir, we have planned our future programme. Actually a total number of 12 reactors of 235 MW capacity and 10 reactors of 500 MW capacity. This is in the planning stage and we will have after Narora, a plant at Rajasthan. Third and fourth reactors one in Kaiga is under consideration and beyond that we have planned other reactors. I said there is a Selection Committee, set up by the Atomic Energy Department which is looking into the question of choosing sites for the future reactors. (*Interruptions*).

SOME HON'BLE MEMBERS: Sir, we have not been given a chance to ask supplementary.

MR. CHAIRMAN: Mr. Kulkarni please. (*Interruptions*). I am, unfortunately, finding it very difficult. None of you raised your hands earlier.

SHRI JAGESH DESAI: We have raised our hands, Sir.

MR. CHAIRMAN: For future guidance, whenever you want to put a question, you please raise your hands even when the first question is put. I am calling in the chronological order.

SHRIMATI JAYANTHI NATARAJAN: Sir, you never look at us.

MR. CHAIRMAN: I never look at any side. My marshal does it.

Please go ahead, Mr. Kulkarni.

SHRI A. G. KULKARNI: Sir, a very lengthy answer which was provided by the hon. Minister and the way in which he was advocating particularly the safe character of the atomic power plant and the progress of the power plants in this country, I think, Sir, a knowledgeable person like the Minister, he must have read the report of the Committee of top scientists of the world which held its meeting at Vienna to consider the Chernobyl accident and what are the factors involved in projecting and designing new atomic power plants? Sir, in view of this, as some of my friends have stated that a doubt has been raised particularly about the accident prone character of the atomic power plant though Dr. Ramanna has stated that it is the safest and it is the cheapest, we have got many expert opinions in this country which is casting doubts. I want to get myself satisfied on this point. There are various U.S., French, Canadian and British designs that we have seen. But Mr. Minister, our own BARC plant, which is the first plant in this country, it is an old Canadian design which is 90 years old and which Canada itself has discarded but we are still running it though, under-rating the capacity. Sir, there are 251 breakages. (*Interruption*).

MR. CHAIRMAN: You question please.

SHRI A. G. KULKARNI: I will complete Sir. I would like to know from the Minister, looking to the various danger aspects of these designs, is there any talk that we have had that the U.S.S.R. is interested in collaborating with this country for some 250 mega watts power plant? We know the USSR design which contains graphite is the most dangerous element in the designing of the atomic power plant. In view of this, what is your effort to design and project an atomic power plant in this country, considering the safety character? The last point is you have approved only Rs 500 crores in the Seventh Plan, is it going to achieve 10,000 megawatt capacity?

SHRI K. R. NARAYANAN: Sir, about the danger aspect, I think, I have already said that all the features, we have incorporated...

SHRI A. G. KULKARNI: What all the...

SHRI K. R. NARAYANAN: If I may say so, in none of the Indian reactors, there have been any accidental fatality as a result of variation during the last 26 years. I think, this is something to be remembered and secondly about danger aspect, there

is danger in the development of technology Sir. We have to choose, whether we will remain timid or we have to be bold in accepting the latest technology. I feel that one contribution which the development of atomic energy has done to this country is that it has taken India to the highest realm of technology, which is not reflected just in electricity but in the general capability, technological capability of this nation, so that we do not again become backward. I think this has to be remembered. Regarding the Canadian plant at BARC, it is not a power plant at all. This Cirus reactor is a research reactor. It is an old one and it has worked for 26 years; and it is still working very well. It has a low capacity; it is a 40 MW plant. It is not a power reactor. It is a research reactor and it is in perfect working order. There is no reason why we should discard it, specially because it is used for research.

Then about the USSR. there are certain proposals about offering a nuclear power plant to India. It is under the consideration of the Government. Beyond that, I do not want to say anything except that it is not just true that all Soviet reactors are based on graphite.

SHRI VITHALRAO MADHAVRAO JADHAV: Mr. Chairman, Sir, I would like to point out a very pertinent point. As Dr. Raja Ramanna has said, the cost per unit of nuclear power production is 84.59 paise and the cost per unit of thermal power production is 91 paise. That means, surely the cost of production per unit of nuclear energy is less than the cost of production per unit of thermal power. Similarly, while the capital investment and the operation cost of nuclear power are more. the cost of fuel is much less. So, we have got large resources of thorium and we have acquired the technology to convert this thorium to enriched plutonium and uranium. So I would like to know whether it is possible to reduce the per unit cost of nuclear energy as compared to the cost of production of hydel energy and thermal energy.

MR. CHAIRMAN: You have given the answer yourself. You have said that Dr. Raja Ramanna has said that the thermal cost is so much and the nuclear energy cost is so much. Mr. Minister, please confirm what he has said.

SHRI K. R. NARAYANAN: I think it is possible to reduce the cost of nuclear energy.

श्री सत्पाल मलिक: श्रीमन्, बिजली घरों की सुरक्षा के बारे में माननीय प्रधान मंत्री जी ने और डा० राजा रमन्ना जी ने जो बयान दिए हैं उनसे काफी आश्वस्ति मिलती है। जहां तक उनके डिजाइनिंग उनके चलने और तकनीक का सवाल है। लेकिन जो जानकारी मैं मंत्री जी से चाहता हूं वह ह्यूमन फैक्टर के सिलसिले में है। चरनोबिल के बारे में ह्यूमन फैक्टर काफी हद तक जिम्मेदार था और चाहे प्रधान मंत्री के जहाज का सवाल हो या रेल दुर्घटना हो उनमें ह्यूमन फैक्टर बहुत दूर तक मौजूद रहता है। तो जो ह्यूमन फैक्टर के खतरे हैं उन को खत्म करने के लिए हमारे जो लोग चुने जाते हैं, उनकी ट्रेनिंग, रख-रखाव और जो अन्य बातें हैं, उनके लिए आप क्या कार्यवाही करने जा रहे हैं?

SHRI K. R. NARAYANAN: Sir, with regard to the human factor which was actually important in regard to the Chernobyl accident as well as the earlier Three Mile accident in the United States, we in India in our atomic energy establishments have highly qualified and highly trained people working. In many of the developed countries, they have relatively a shortage of such people. But all the people working in our atomic energy establishments, especially reactors. etc., are highly qualified and highly trained people. Therefore, as far as the human factor is concerned, I think we have very fine, very well trained human factor which

would do everything to avoid human errors.

MR. CHAIRMAN: Question No. 144.

Fire in Siddhartha Hotel

*144. SHRI ASHWANI KUMAR:† SHRI KAILASH PATI MISHRA:

Will the Minister of HOME AFFAIRS be pleased to state:

(a) whether an inquiry commission was appointed to go into the causes of and to suggest remedial measures about the devastating fire in Siddhartha Hotel in New Delhi on 23rd January last;

(b) what are its findings and recommendations and whether the report is proposed to be laid on the Table of the House;

(c) number of claims filed, accepted and date of payments thereof;

(d) criteria and procedure of determining the claim amount; and

(e) names of persons whose claims have not been paid and reasons therefor?

THE MINISTER OF STATE IN THE MINISTRY OF HOME AFFAIRS (SRHI CHINTAMANI PANIGRAHI): (a) Yes, Sir.

(b) The report of the Inquiry Commission is awaited from the Delhi Administration. The report together with the Memorandum of Action taken will be laid on the Table of the House.

(c) to (e) It is a matter between the private parties. The concerned parties have to file claims in civil courts and the courts will decide the quantum of compensation in each individual case.

श्री अश्विनी कुमार : माननीय सभापति महोदय, मैं मंत्री जी का आभारी हूं कि उन्होंने आश्वासन दिया है कि यह रिपोर्ट सदन के पटल पर रखी जायेगी। आजकल कई रिपोर्टों को नहीं भी रखा जाता। इसके काज के बारे में, इसकी समस्याओं के बारे में उसी समय विचार होना चाहिए जब रिपोर्ट आ जाए। दूसरा विषय आज क्लेम का है। इस ओर आपका ध्यान आकर्षित करना चाहता हूं। रेलवे एक्सीडेंट होता है रेलवे क्लेम कुछ देती है 10,20,30 हजार देती है। एयर एक्सीडेंट होता है उसमें भी कुछ क्लेम दिया जाता है। बहुत सी दुर्घटनाएं सड़क पर होती हैं। बहुत से लोग मारे जाते हैं। उनके क्लेम के लिए कोर्ट्स में जाना पड़ता है। इश्योरेंस कम्पनी में जाना पड़ता है। वर्षों तक उसके पीछे दौड़ना पड़ता है।

अभी अपने देश में पिछले दिनों एक बहुत बड़ी दुर्घटना भोपाल में हुई। दो साल के लगभग बीत गये। किसी भी समस्या का निदान नहीं हुआ। इन दुर्भाग्यशाली लोगों को कहां से क्लेम मिलेगा, कौन क्लेम देगा पता नहीं। न सरकार न यूनियन कार्बाइड से देने का फैसला हुआ है। हजारों परिवार टकटकी लगाये बैठे हैं। बहुत से लोग बिना सहायता के मरते जा रहे हैं।

इसी प्रकार सिद्धार्थ होटल की दुर्घटना हुई। 37 लोग मारे गये हैं। आपका कहना है कि अपना पर्सनल क्लेम फाइल करें। एक क्लेम फाइल किया गया है 50 लाख का, दूसरा किया जायेगा 100 लाख का और तीसरा किया जायेगा 10 लाख का। जैसी जिस की रसियत होगी वह क्लेम फाइल करेगा। इस प्रकार से अनावश्यक समय लगता चला जायेगा। इससे पता नहीं चलेगा कि मरने वालों के परिवारों को कब सहायता मिलेगी कब नहीं। आपके अपने कानून की व्यवस्था है उसमें कितना खर्चा होगा, इन सारी चीजों को देखते हुए मैं मंत्री महोदय से जानना चाहूंगा कि ऐसी भीषण दुर्घटना के लिए क्या सरकार कोई बोर्ड

†The question was actually asked on the floor of the House by Shri Ashwani Kumar.