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**BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED (BHAVINI)**

**DEPARTMENT OF ATOMIC ENERGY**

**COMMITTEE ON PUBLIC UNDERTAKINGS  
(2015-2016)**

**TENTH REPORT**

**(SIXTEENTH LOK SABHA)**



**LOK SABHA SECRETARIAT**

**NEW DELHI**

**TENTH REPORT**  
**COMMITTEE ON PUBLIC UNDERTAKINGS**  
**(2015-2016)**  
**(SIXTEENTH LOK SABHA)**

**BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED (BHAVINI)**

**DEPARTMENT OF ATOMIC ENERGY**

**(Action taken by the Government on the Observations / Recommendations  
contained in the Sixth Report of Committee on Bharatiya Nabhikiya Vidyut Nigam  
Limited (BHAVINI))**



**Presented to Lok Sabha on 08.12. 2015**

**Laid on the table of Rajya Sabha on 08.12. 2015**

**LOK SABHA SECRETARIAT**

**NEW DELHI**

**08 December 2015 / 17 Agrahayana 1937 (S)**

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## **COMPOSITION OF COMMITTEE ON PUBLIC UNDERTAKINGS (2015-16)**

Shri Shanta Kumar - Chairperson

### Members Lok Sabha

2. Sh. L.K. Advani
3. Sh. Ramesh Bais
4. Shri Pankaj Chaudhary
5. Shri Nand Kumar Singh Chauhan
6. Sh. Biren Singh Engti
7. Shri Feroze Varun Gandhi
8. Dr. Kambhampati Haribabu
9. Shri Baijayant Panda
10. Shri Prahlad Patel
11. Shri Rayapati Sambasiva Rao
12. Shri Ram Sinh Rathwa
13. Prof. Saugata Roy
14. Shri B. Senguttuvan
15. Shri Sushil Kumar Singh

### Members Rajya Sabha

16. Shri Narendra Budania
17. Shri Muthukaruppan
18. Shri Praful Patel
19. Shri Rangasayee Ramakrishna
20. Shri C.M. Ramesh
21. Shri Tapan Kumar Sen
22. Shri Ramachandra Prasad Singh

### Secretariat

1. Smt. Sudesh Luthra - Joint Secretary
2. Smt. Anita B. Panda - Director
3. Shri Haokip Kakai - Executive Assistant

## INTRODUCTION

I, the Chairperson, Committee on Public Undertakings (2015-16) having been authorized by the Committee to submit the Report on their behalf, present this Tenth Report on 'Action Taken by the Government on the Observations/Recommendations contained in the Sixth Report of the Committee on Public Undertakings (Sixteenth Lok Sabha) on "Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI)'.

2. The Sixth Report of the Committee on Public Undertakings was presented to Lok Sabha / laid on the Table of Rajya Sabha on 28.04.2015. Replies of the Government to the Observations/Recommendations contained in the Report were received on 20.10.2015.

3. The Committee considered and adopted the draft Report at their sitting held on 27.11.2015.

4. An analysis of the action taken by the Government on the Observations/Recommendations contained in the Sixth Report of the Committee (2014-2015) is given in Annexure.

**New Delhi**  
**02 December, 2015**  
**11 Agrahayana, 1937(S)**

**SHANTA KUMAR**  
**Chairperson,**  
**Committee on Public Undertakings.**

## **CHAPTER I**

### **REPORT**

This Report of the Committee deals with the action taken by the Government on the observations/recommendations contained in the Sixth Report (Sixteenth Lok Sabha) of the Committee on Public Undertakings (2014-15) on "Bharatiya Nabhikiya Vidyut Nigam Limited". The Report was presented to the Parliament on the 28th April, 2015. The Report contained eight observations/recommendations.

2. Action Taken notes have been received from the Government in respect of all the eight observations/recommendations contained in the Report. These have been categorized as follows:

- (i) Observations/Recommendations which have been accepted by the Government (Chapter II)  
Sl. Nos. 1, 2, 3, 4, 5, 6 and 8. (Total 07)
- (ii) Observation/Recommendation which the Committee do not desire to pursue in view of the Government's replies (Chapter III)  
Sl. No. 7 (Total 1)
- (iii) Observations/Recommendations in respect of which replies of the Government have not been accepted by the Committee (Chapter IV)  
Nil
- (iv) Observations/Recommendations to which final replies of the Government have furnished interim replies (Chapter V)  
Nil

3. The Committee desire that response to their comments in Chapter I of the Report should be furnished to them expeditiously.

4. The Committee will now deal with the action taken by the Government on some of the recommendations in the succeeding paragraphs.

#### **Recommendation (Sl. No. 1)**

#### **India's Nuclear Energy Programme: Commissioning of FBRs**

5. With regard to India's Nuclear Energy Programme the Committee in their Sixth Report, had recommended as follows :-

"The Committee observe that the nuclear energy programme has been visualised to grow in three stages, which is sequential as each stage has fuel cycle linkages in which spent fuel from one stage is reprocessed to obtain fuel for the next

stage. The Committee understand that having obtained commercial success in the Stage - I Pressurized Heavy Water Reactors (PHWRs), Stage II Fast Breeder Reactors (FBRs) was taken up for implementation to attain energy security for the Nation. The Committee feel that BHAVINI, which was formed as a Special Purpose Vehicle (SPV) to facilitate implementation of the Stage II expeditiously has a greater role to play in bringing long-term energy security of the nation. Since nuclear energy offers the most potent solution to long term energy security, the Committee are firmly of the view that India has to successfully realise the three stage development and thereby tap its vast thorium reserves to become truly energy independent beyond 2050. They, therefore, urge upon BHAVINI to make all out efforts for expediting the commissioning of and also ramp up the capacity of FBRs so as to achieve energy security in the country. They also desire that DAE should develop adequate technologies for commercial exploitation of vast thorium reserves of the nation".

6. The Department of Atomic Energy in their action taken reply, has stated as follows :-

"We gratefully appreciate the perception of the members of COPU. It reflects thoroughly the mission of BHAVINI under DAE. We thank COPU for bringing out the important role of the units of DAE for the realisation of commercial exploitation of the vast Thorium reserves in the nation.

**7. The Committee in their earlier Report had recommended for all out efforts to expedite the commissioning of and also ramping up the capacity of FBRs so as to achieve energy security in the country. They had also emphasized to develop adequate technologies for commercial exploitation of vast thorium reserves of the nation. The Committee note that the reply of the DAE is a mere formality and as such does not provide any details of the progress achieved in completion of stage 1 i.e. Prototype Fast Breeder Reactor (PFBR) project so far. The Committee are aware that the PFBR project has already suffered time and cost overruns, some of the reasons for which were though beyond the control of DAE. As the PFBR would be followed by stage II FBRs, the Committee note from the replies submitted by DAE that FBR 1 & 2 beyond PFBR, has been already conceptualized by the Department and will be executed for its commissioning. The intention of the Committee was to emphasize upon the fact that the Department must strictly monitor adherence to the laid down timelines so as to ensure that there are no delays in achieving the aim of energy security by the year 2050, hence a detailed reply from the Department addressing the Committee's concerns was expected from them. Therefore, the Committee strongly reiterate their earlier recommendation and expect to be apprised of the specific action taken so far in the matter.**

## **Recommendation (Sl. No.2)**

### **Board of Directors**

8. On the issue concerning the appointment of two independent Directors in the Board of Directors in BHAVINI, the Committee, in their Sixth Report, had recommended as follows:-

"The Committee noted that while the Board of Directors of all Government companies are constituted as per the Department of Public Enterprises (DPE) guidelines, BHAVINI's Board of Directors was constituted as per Atomic Energy Commission (AEC) guidelines. Giving justification for having separate guidelines, BHAVINI stated that pursuit of the objectives set for the Company involves management of certain unique challenges unlike other PSEs. Further BHAVINI's organizational role encompasses implementation of an entire spectrum of activities from developing technology, design, engineering and construction to commissioning, operation and maintenance of FBRs which is different from other PSUs. Notwithstanding separate guidelines for the Company, the Committee find that there were vacancies for two independent Directors and proposal for appointment of only one Director was sent by the Company to DAE on 3rd August, 2013. It was only in February, 2015 that DAE informed the Committee that it has approved the appointment of two independent directors to the Board of BHAVINI and sent the same for further processing. The Committee are of the considered view that since BHAVINI is required to achieve its objectives entirely by indigenous efforts without access to external resources, either technological, financial or in terms of human resource expertise, timely induction of two professionals of eminence from industry in private / non-government sector with a high degree of proven ability as independent directors in BHAVINI's board would have certainly provided the Company the expertise needed for better operational proficiency in the project management of PFBR. They, therefore, deprecate the flippant attitude of the Management in treating an important matter in an unimportant and unprofessional manner. They, therefore, would like to caution the Company to be careful in future while dealing with such important issues".

9. The Department of Atomic Energy, in their Action Taken Reply, has stated as follows:-

"BHAVINI Board consists of professionals drawn from Planning Commission (now NITI Ayog), Ministry of power, Director (BARC) and Director (IGCAR) besides government directors and functional directors. These Professional directors, appointed by President, are guiding the Company in an independent and professional manner. BHAVINI brought to the notice of Department of Atomic Energy regarding appointment of Independent Directors as per AEC Guidelines in the year 2013. Department of Atomic Energy has sent the proposal to Department of Personnel & Training, Government of India for appointment of



two Independent Directors on the Board of BHAVINI in February, 2015, seeking approval of Appointment Committee of Cabinet (ACC). Department of Personnel and Training (DoPT) vide its OM dated 06.10.2015 has conveyed approval of ACC for appointment of one Independent Director on the Board of BHAVINI".

**10. While the Committee have no doubts about the professional capabilities of existing BHAVINI Board members, they in their original Report, had raised the point of non-inclusion of two independent Directors in the Board. They were of the considered view that as BHAVINI is required to achieve its objectives entirely by indigenous efforts without access to external resources, either technological, financial or in terms of human resource expertise, timely induction of two professionals of eminence from industry in private / non-government sector with a high degree of proven ability as independent directors in BHAVINI's Board would have certainly provided the Company the expertise needed for better operational proficiency in the project management of PFBR. The Action taken reply is a mere repetition of the fact already known to the Committee that the proposal for the same was sent by the DAE to DoPT in February, 2015, two years after the matter was brought to the attention of DAE by BHAVINI. No reason for the delay has been given by the DAE in the reply. Besides as the DoPT is stated to have approved appointment of only one Independent Director, the Committee desire to know reasons for not taking up the matter for approval of another Director. They would again like to emphasize upon the fact that delays need to be addressed at all levels for the efficient handling of PFBR project and its timely commissioning. Hence, the Committee desire to be apprised as to whether the approved incumbent has since joined BHAVINI Board. The Committee also would like to have response from DAE on the progress regarding the action taken for appointment of the second independent Director.**

#### **Recommendation (Sl. No.4)**

#### **PFBR project at Kalpakkam**

11. With regard to delay in commissioning of Kalpakkam PFBR project, the Committee, in their Sixth Report, had recommended as follows:-

"The Committee are concerned to note that there have been inordinate delays in the commissioning of the PFBR at Kalpakkam. As per the original schedule, the project was to be commissioned in September, 2010, which was later revised to September, 2014. The deadline was further extended to September, 2016. The reasons for delay were attributed to factors such as Tsunami (December, 2004), technological challenges involved in manufacturing of the first of its kind equipment and integration of the equipment in a sequential manner etc. The Committee feel that though this project is first of its kind yet such challenges could have been anticipated and the completion schedule should have been fixed accordingly. Repeated postponement of the deadlines causes enormous time and cost overruns leading to huge loss to national exchequer. Besides, such

delay would also hamper India's effort towards achieving energy security in the long run. The Committee regret to note that despite steering committee headed by Secretary, DAE conducting regular meetings on quarterly basis for monitoring the activities of various projects including PFBR in which achievements, constraints, physical and financial progress are reviewed, such review meetings have not yielded any concrete results as the completion schedule has been changed due to various constraints resulting in considerable delay in achieving criticality. During their study visit to BHAVINI's project site at Kalpakkam, the Committee found that the PFBR have incorporated state of the art technology and had achieved considerable physical progress. While appreciating the remarkable work done by the scientists of our country, the Committee hope that the Company will take all necessary steps to expedite the remaining work so that the reactor is commissioned within the stipulated revised time schedule."

12. The Department of Atomic Energy, in their Action Taken Reply, has stated as follows:-

"The Department acknowledges the appreciation by the Committee for the sustained efforts of the Scientists and Engineers of DAE. This truly motivates all of us. Looking at the progress achieved till date, the Department is not envisaging any possibility of the slippage in the completion date of PFBR project i.e. September 2016".

**13. The Committee note with satisfaction that the DAE is confident about the completion date of September, 2016 of the PFBR project as per the extended deadlines. The Committee hope that once PFBR Project is completed, the FBRs at stage II would be implemented as planned. However, the Committee would like to be provided with clear stage-wise details of the commissioning of PFBR Project till date.**

#### **Recommendation (Sl. No.8)**

#### **Civil Liability for Nuclear Damages**

14. The Committee, in their Sixth Report, had recommended as follows:-

"Another related issue which needs to be highlighted in the light of safety of Nuclear Power Plant is the civil liability for nuclear damages. The Committee noted that DAE, in consultation with the General Insurance Corporation (GIC) of India is trying to develop a nuclear insurance pool, which will help in coming up with an insurance policy for the liability of nuclear power / energy. The Committee were informed that since the nuclear industry in the country does not have adequate capacity and resources to raise the nuclear insurance pool, DAE has requested the Ministry of Finance for providing with assistance to extend a sovereign guarantee for Rs. 750 crore, which is stated to be under their consideration. The Committee urge upon DAE to pursue this matter with Ministry

of Finance at the highest level so that the sovereign guarantee is extended by the Government for creation of adequate nuclear insurance pool so that GIC will be in a position to offer an insurance product for the risks associated with generation of Nuclear Energy".

15. In their Action Taken Reply on the above recommendation, the Department of Atomic Energy has stated as follows:-

"With the efforts of the Department, General Insurance Corporation of India (GIC Re) has launched the Indian Nuclear Insurance Pool (INIP) on 12.06.2015 to the tune of Rs. 1500 crore to cover the Operator's liability under Civil Liability for Nuclear Damage Act, 2010. The entire capacity of Rs. 1500 crore for INIP has been arranged by GIC Re from Indian market only. GIC-Re is in the process of finalising the terms and conditions of the Insurance Product in consultation with Nuclear Power Corporation of India Limited, a Public Sector Undertaking of the Department and an Operator under CLND Act".

**16. The Committee are happy to learn that the General Insurance Corporation of India (GIC Re), in consonance with the efforts of the DAE has launched the Indian Nuclear Insurance Pool (INIP) on 12.06.2015 to the tune of Rs. 1500 crore to cover the operator's liability under Civil Liability for Nuclear Damages Act, 2010. It is appreciable further that the entire capacity of Rs. 1500 crore for INIP has been arranged by GIC Re from Indian Market only. The Committee hope that the insurance product would be finalised well in time and would like to be apprised if any timeline is fixed for its launch. The Committee would also like the Department to specify progress on the matter of extension of Sovereign guarantee by the Ministry of Finance for creation of adequate nuclear insurance pool.**

## CHAPTER II

### RECOMMENDATIONS THAT HAVE BEEN ACCEPTED BY THE GOVERNEMENT

#### Recommendation at Sl. No.1

##### India's Nuclear Energy Programme: Role of BHAVINI

The Committee observe that the nuclear energy programme has been visualised to grow in three stages, which is sequential as each stage has fuel cycle linkages in which spent fuel from one stage is reprocessed to obtain fuel for the next stage. The Committee understand that having obtained commercial success in the Stage - I Pressurized Heavy Water Reactors (PHWRs), Stage II Fast Breeder Reactors (FBRs) was taken up for implementation to attain energy security for the Nation. The Committee feel that BHAVINI, which was formed as a Special Purpose Vehicle (SPV) to facilitate implementation of the Stage II expeditiously has a greater role to play in bringing long-term energy security of the nation. Since nuclear energy offers the most potent solution to long term energy security, the Committee are firmly of the view that India has to successfully realise the three stage development and thereby tap its vast thorium reserves to become truly energy independent beyond 2050. They, therefore, urge upon BHAVINI to make all out efforts for expediting the commissioning of and also ramp up the capacity of FBRs so as to achieve energy security in the country. They also desire that DAE develop adequate technologies for commercial exploitation of vast thorium reserves of the nation.

#### Reply of the Government

We gratefully appreciate the perception of the members of COPU. It reflects thoroughly the mission of BHAVINI under DAE. We thank COPU for bringing out the important role of the units of DAE for the realisation of commercial exploitation of the vast Thorium reserves in the nation.

#### Recommendation at Sl. No.2

##### Board of Directors

The Committee noted that while the Board of Directors of all Government companies are constituted as per the Department of Public Enterprises (DPE) guidelines, BHAVINI's Board of Directors was constituted as per Atomic Energy Commission (AEC) guidelines. Giving justification for having separate guidelines, BHAVINI stated that pursuit of the objectives set for the Company involves management of certain unique challenges unlike other PSEs. Further BHAVINI's

organisational role encompasses implementation of an entire spectrum of activities from developing technology, design, engineering and construction to commissioning, operation and maintenance of FBRs which is different from other PSUs. Notwithstanding separate guidelines for the Company, the Committee finds that there were vacancies for two independent Directors and proposal for appointment of only one Director was sent by the Company to DAE on 3<sup>rd</sup> August, 2013. It was only in February, 2015 that DAE informed the Committee that it has approved the appointment of two independent directors to the Board of BHAVINI and sent the same for further processing. The Committee are of the considered view that since BHAVINI is required to achieve its objectives entirely by indigenous efforts without access to external resources, either technological, financial or in terms of human resource expertise, timely induction of two professionals of eminence from industry in private / non-government sector with a high degree of proven ability as independent directors in BHAVINI's board would have certainly provided the Company the expertise needed for better operational proficiency in the project management of PFBR. They, therefore, deprecate the flippant attitude of the Management in treating an important matter in an unimportant and unprofessional manner. They, therefore, would like to caution the Company to be careful in future while dealing with such important issues.

### **Reply of the Government**

BHAVINI Board consists of professionals drawn from Planning Commission (now NITI Ayog), Ministry of power, Director (BARC) and Director (IGCAR) besides government directors and functional directors. These Professional directors, appointed by President, are guiding the Company in an independent and professional manner.

BHAVINI brought to the notice of Department of Atomic Energy regarding appointment of Independent Directors as per AEC Guidelines in the year 2013. Department of Atomic Energy has sent the proposal to Department of Personnel & Training, Government of India for appointment of two Independent Directors on the Board of BHAVINI in February, 2015, seeking approval of Appointment Committee of Cabinet (ACC). DoPT vide its OM dated 06.10.2015 has conveyed approval of ACC for appointment of one Independent Director on the Board of BHAVINI.

### **Recommendation at Sl. No.3**

#### **Nuclear Power Generation vis-a-vis Plan targets**

The Committee note with concern that the generation of Nuclear Power declined during the XI Plan period. Despite revision of the target from 163395 MUs to 124608 MUs at MTA stage, the actual power generated was merely 109642. The reasons for shortfall during the XI Plan were stated to be primarily related to shortage of fuel due to demand-supply mismatch of domestic uranium, delay in international co-operation, delay in completion of Kudankulam 1 & 2 projects and delay in completion of PFBR (BHAVINI) project. Further, delay in completion of Kudankulam also accounted for the shortfall during the XII Plan period as well. The Committee are disquiet to note that

targets were fixed by the DAE taking into account presumptive factors and they could not foresee the impending difficulties, which accounted for the shortfall in targets. The Committee are of the considered view that since nuclear energy has an important role in the energy mix of the Country, particularly in the context of energy security, they, therefore, recommend that DAE should make all out efforts to see that all impediments / problems are removed so that the targets set for generation of nuclear power are achieved by all the nuclear plants.

### **Reply of the Government**

Nuclear Power Corporation of India Limited, a public sector undertaking of this Department has achieved highest ever commercial power generation of 35592 Million KWh (MUs) during financial year 2014-15 increased by 3.99% as against 34228 MUs during 2013-14. This is excluding 2243 MUs of infirm power generation during the year by Kudankulam Nuclear Power Plant Unit 1.

Unit 1 of Kudankulam Nuclear Power Project, India's largest single Nuclear Power Project (2 x 1000 MW) being implemented with Technical Co-operation with Russian Federation, was put into commercial operation with effect from December 31, 2014. Unit 2 is at an advanced stage of commissioning.

The Government have made efforts to augment indigenous uranium supply by opening of new mines and processing facilities thus narrowing down the demand-supply gap for reactors using indigenous fuel. Further, the international cooperation agreements have opened up the possibilities of import of fuel for reactors under IAEA Safeguards. As a result of these efforts, there has been a progressive improvement in capacity utilisation of nuclear power plants.

The target of electricity generation from nuclear power in the XII Five Year Plan period (2012-17) is 2,41,748 Million Units against which a total of 1,22,342 MUs of power has been generated up to August, 2015. With the expected commissioning of Kudankulam Nuclear Power Plant Unit 2 and PFBR, the Department is confident of achieving the target of electricity generation set for XII Five Year Plan Period.

With regard to PFBR project, in the process of regulatory review, several technical and safety issues had to be investigated thoroughly from the view point of designers, regulators and public. We should be careful that unforeseen problems do not arise in completing the targeted milestones. Particularly in PFBR, considerable delay has taken place which was not fully anticipated in the manufacturing of components in view of limited industries available in the country which could meet the stringent dimensional and quality control requirements. Multi-stage review processes, developing infrastructure for handling, transportation & erection and providing elaborate training to the young construction team who were having limited exposure/experience with special nuclear components, took considerable time. Compared to International scenario and global efforts put-forth for the FBR development, the time taken for PFBR seems to be reasonable. Only a few countries have mastered the fast reactor technology. All units of DAE and other R&D units in the country are also putting their best efforts to ensure successful commissioning of PFBR. The Department is going ahead with confidence on deployment of FBRs for commercial exploitation.

## **Recommendation at Sl. No.4**

### **Delay in Commissioning of BHAVINI Project**

The Committee are concerned to note that there have been inordinate delays in the commissioning of the PFBR at Kalpakkam. As per the original schedule, the project was to be commissioned in September, 2010, which was later revised to September, 2014. The deadline was further extended to September, 2016. The reasons for delay were attributed to factors such as Tsunami (December, 2004), technological challenges involved in manufacturing of the first of its kind equipment and integration of the equipment in a sequential manner etc. The Committee feel that though this project is first of its kind yet such challenges could have been anticipated and the completion schedule should have been fixed accordingly. Repeated postponement of the deadlines causes enormous time and cost overruns leading to huge loss to national exchequer. Besides, such delay would also hamper India's effort towards achieving energy security in the long run. The Committee regret to note that despite steering committee headed by Secretary, DAE conducting regular meetings on quarterly basis for monitoring the activities of various projects including PFBR in which achievements, constraints, physical and financial progress are reviewed, such review meetings have not yielded any concrete results as the completion schedule has been changed due to various constraints resulting in considerable delay in achieving criticality. During their study visit to BHAVINI's project site at Kalpakkam, the Committee found that the PFBR have incorporated state of the art technology and had achieved considerable physical progress. While appreciating the remarkable work done by the scientists of our country, the Committee hope that the Company will take all necessary steps to expedite the remaining work so that the reactor commissioned within the stipulated revised time schedule.

### **Reply of the Government**

The Department acknowledges the appreciation by the committee for the sustained efforts of the Scientists and Engineers of DAE. This truly motivates all of us. Looking at the progress achieved till date, the Department is not envisaging any possibility of the slippage in the completion date of PFBR project i.e. September 2016.

## **Recommendation at Sl. No.5**

### **Cost of Production and Economic Viability of Nuclear Projects**

The Committee note that the cost of the PFBR project went up from Rs. 3492 crore to Rs. 5677 crore leading to cost escalation of Rs. 2185 crore. The Committee find that although initially the project was planned to be handled by Indira Gandhi Centre for Atomic Research (IGCAR) and the DPR was prepared by them, subsequently BHAVINI was formed to execute the project, which led to cost escalation. Government took the decision in view of the long term perspective of many future fast breeder reactors that

have to be built in the country on commercial basis. The Committee wonder why the Government failed to visualize this at the time of conceptualization of the project.

Another related issue is the economic viability of the Nuclear Power vis-avis other conventional sources of energy. The projected tariff of nuclear power to be produced from Kudankulam appears to be costlier than that of the other generating technologies. DAE's own admission that 'the cost of generation or the unit energy cost is the barometer for adjudging economic viability and competitiveness of a source of electricity generation' speaks eloquently of the competitive disadvantage of the nuclear power vis-a-vis other sources of energy. The Committee have been informed that BHAVINI is expected to break even when the 500 MWe PFBR operates at 62.8% capacity factor, which means that the gestation period of Nuclear Power Plants is very high. However, the Committee are of the considered view that nuclear power is an intense energy source and is inherently sustainable. Moreover, deployment of Nuclear Power to produce electricity avoids emission of carbon dioxide, thereby helping in decarbonization of environment. Having appreciated the usefulness of the nuclear power, as a clean form of energy, the Committee urge the Company to make concerted efforts towards reducing the overall cost of Nuclear power to make it economically more viable. They also desire that the nodal Department should ensure that bottlenecks, if any, faced by the Company in the process are sorted out without any loss of time.

### **Reply of the Government**

The Department fully agrees with the Committee's view that the FBRs are commercially competitive apart from the benefits from environmental considerations. BHAVINI has also understood that capital cost and construction time are the two major factors to be reduced to make FBR plant competitive. Future FBRs, being constructed on twin units basis, will bring down the cost significantly. Though PFBR is a single unit, the preliminary assessment of unit energy cost is found to be acceptable, with the current context of the unit energy cost of modern power plants. The Department has also conceptualised FBR 1&2 beyond PFBR by introducing several novel features for improving economy and enhanced safety to meet the emerging safety criteria. The Department is targeting for unit energy cost similar to new PHWR plants planned by the Department. All efforts will be made to keep the Unit Energy Cost of FBRs comparable with that of fossil power plants. However, it is mentioned that this evolution would happen over decades. Hence, benefits of FBR should be visualised in a long run which will be certainly attractive. In the Indian context, this option is essential.

The current tariff of nuclear power, both from indigenous reactors and from reactors set up with foreign technical cooperation (KKNPP) is comparable with that of other contemporary base-load electricity generating technologies like coal based thermal power stations in the region. The endeavour of the Department is to work towards reducing costs to retain the competitiveness of nuclear power. In respect of indigenously designed Pressurised Heavy Water Reactors (PHWRs), efforts in this regard have included increasing unit size from 220 MW to 540 MW and further to 700 MW to gain from economies of scale, standardisation, improvement in design and efficiency, and optimisation of gestation period. In respect of projects to be set up with



foreign cooperation, the measures include adopting appropriate business models to arrive at competitive cost.

### **Recommendation at SI. No.6**

#### **Procurement Policy**

The Committee are heartened to note that notwithstanding the fact that equipment being used in Prototype Fast Breeder Reactor is technologically sophisticated and entails stringent specifications and that the tools and methodologies used are first of its kind. Yet, more than 95 per cent of the equipment for the PFBR is being sourced from Indian industry. The Committee appreciate the efforts made by BHAVINI for procuring its equipment through indigenous sources as this will give fillip / boost for the 'Make-in-India' campaign. The Committee desire that BHAVINI should continue making efforts towards indigenization of the manufacturing of various components and engage more proactively with the Indian companies both in public and private sector for the development of state of the art technologies, so that apart from achieving the objectives of energy security, it will provide a definite boost to the indigenous manufacturing capabilities.

#### **Reply of the Government**

The Department appreciates the views expressed by the Committee. BHAVINI will adhere to the committee's recommendations on procurement policy for design and construction of future FBRs also.

### **Recommendation at SI. No.8**

#### **Civil Liability for Nuclear Damages**

Another related issue which needs to be highlighted in the light of safety of Nuclear Power Plant is the civil liability for nuclear damages. The Committee noted that DAE, in consultation with the General Insurance Corporation (GIC) of India is trying to develop a nuclear insurance pool, which will help in coming up with an insurance policy for the liability of nuclear power / energy. The Committee were informed that since the nuclear industry in the country does not have adequate capacity and resources to raise the nuclear insurance pool, DAE has requested the Ministry of Finance for providing with assistance to extend a sovereign guarantee for Rs. 750 crore, which is stated to be under their consideration. The Committee urge upon DAE to pursue this matter with Ministry of Finance at the highest level so that the sovereign guarantee is extended by the Government for creation of adequate nuclear insurance pool so that GIC will be in a position to offer an insurance product for the risks associated with generation of Nuclear Energy.

### **Reply of the Government**

With the efforts of the Department, General Insurance Corporation of India (GIC Re) has launched the Indian Nuclear Insurance Pool (INIP) on 12.06.2015 to the tune of Rs. 1500 crore to cover the Operator's liability under Civil Liability for Nuclear Damage Act, 2010. The entire capacity of Rs. 1500 crore for INIP has been arranged by GIC Re from Indian market only. GIC-Re is in the process of finalising the terms and conditions of the Insurance Product in consultation with Nuclear Power Corporation of India Limited, a Public Sector Undertaking of the Department and an Operator under CLND Act.

## CHAPTER III

### OBSERVATIONS/RECOMMENDATIONS WHICH THE COMMITTEE DO NOT DESIRE TO PURSUE IN VIEW OF THE GOVERNMENT'S REPLIES

#### Recommendation at Sl. No.7

#### SAFETY OF NUCLEAR PLANT

The Committee were informed that in the aftermath of December 2004 Tsunami, many novel design features had been incorporated in Prototype Fast Breeder Reactor (PFBR) which provide a robust safety architecture. Besides, the safety of the plant is governed and regulated by Atomic Energy Regulatory Board (AERB) and the Standard Operating Procedures (SOPs) issued by it are very stringent and rigorously followed. However, the Committee feels that post Fukushima nuclear disaster, there is an increasing apprehension in the minds of the people regarding the safety of nuclear plants. Therefore, the Committee urge upon the Company to take proactive steps to allay such fears from the minds of the people so as to mould a favourable public opinion about the usefulness of the PFBR. A robust media campaign highlighting the significance and importance of the project and its environment-friendly attributes will have to be given adequate thrust. Further, keeping in view the current trends of terrorism, the Department should take adequate safeguards to ensure that there is no theft or loss of nuclear material. Moreover, the Committee would hope that the depleted uranium and plutonium after the reprocessing of the fuel should be properly cooled and stored before it is ultimately vitrified.

#### Reply of the Government

- Scientific facts behind the Fukushima accident have been brought out clearly to the public through various means like extensive media coverage, face to face interviews in open channels inviting participation from external experts, addressing the neighbourhood village representatives, cycle rallies, distribution of circulars to neighborhood schools and colleges.
- Extensive and immediate actions taken to raise the safety of the plant against large scale earthquakes (beyond design levels) to comply with the enhanced safety requirements stipulated by AERB, have been made available to public, particularly for the academicians. This includes building tall walls completely enveloping the plant site to prevent the sea water entering plant area (in the event of very high level of Tsunami having very low probability of occurrence), earthquake and Tsunami warning signals, etc. This apart, the leak tightness of reactor containment building and structural strengthening of various safety related structures have been enhanced very stringently.
- As a part of defense-in-depth safety, the philosophy followed in the nuclear power plants, several measures have been implemented to mitigate the

consequences of severe events. Laying alternate roads, installation of emergency control rooms, ensuring availability of raw water supplies, mobile diesel generators are a few to name.

- Free exchange of design provisions and features incorporated / to be incorporated to prevent / mitigate the consequences of all possible accidents, with international experts / organisations (IAEA for example). DAE organized many meetings as well as participated in almost all the meeting on this subject and contributed significantly.
- Wide publicity have been given on the benefits of PFBR plant in minimising the waste management burden through recycling the spent fuel extracted from the plant (in the closed fuel cycle concept), thereby effectively utilising the available uranium ores in the country and ensuring sustainable electricity supply for the long periods.
- Robust mechanism has been established to issue immediate rejoinder for the false reports in the media.
- Providing ample opportunities for the locals to work for the project, thereby to understand the various safety features of plant in their day to day activities.
- Ensuring the public on the absence of radioactivity release by continuous monitoring of effluent releases through sea and atmospheric dispersions. In this exercise, external agencies are extensively involved. It is planned to continue above efforts in an enhanced manner in future over the entire life of the plants.
- Foreign material exclusion philosophy is established comprehensively and strictly followed in-line with international standards and guides. In this respect, development of novel and innovative sensors to identify the strategic material transport is given high emphasis through indigenous efforts in collaboration with national and international institutions.
- In closed fuel cycle concept conceived for PFBR plant, the depleted uranium itself is the major material, mixed with the plutonium to fabricate fuel pellets and fed back to the reactor. The total cycle length is about two years. Hence, there is no need of long term storage. The spent fuel extracted from the reactor is cooled in a water pool for a shorter duration in the intermediate stage. This is the unique feature of fast reactor with closed fuel cycle.

Fast Reactor Fuel Cycle Facility (FRFCF), which is currently under construction, facilitates to realise the closed fuel cycle option. Both PFBR and FRFCF are co-located adjacent to each other and hence, there is no need of long distance transport of radioactive materials.

## CHAPTER IV

### RECOMMENDATIONS IN RESPECT OF WHICH REPLIES OF THE GOVERNMENT HAVE NOT BEEN ACCEPTED BY THE COMMITTEE

-- NIL --

**CHAPTER V**

**OBSERVATIONS/RECOMMENDATIONS IN RESPECT OF WHICH FINAL REPLIES  
OF THE GOVERNMENT ARE STILL AWAITED**

-- NIL --

**New Delhi  
02 December, 2015  
11 Agrahayana 1937(S)**

**SHANTA KUMAR  
Chairperson,  
Committee on Public Undertakings.**

## APPENDIX I

### **COMMITTEE ON PUBLIC UNDERTAKINGS** **(2015-2016)**

#### **MINUTES OF THE FOURTEENTH SITTING OF THE COMMITTEE**

The Committee sat on Friday, the 27<sup>th</sup> November 2015 from 1500 hrs to 1545 hrs in Committee Room 'D', Ground Floor, Parliament House Annexe, New Delhi.

#### **PRESENT**

Shri Shanta Kumar - Chairperson

#### **MEMBERS**

##### ***Lok Sabha***

2. Shri Baijayant Panda
3. Dr. Kambhampati Haribabu
4. Shri Prahlad Singh Patel
5. Shri Sushil Kumar Singh

##### ***Rajya Sabha***

6. Shri Praful Patel
7. Shri Rangasayee Ramakrishna

#### **SECRETARIAT**

1. Smt. Sudesh Luthra      Joint Secretary
2. Smt Anita B. Panda      Director
3. Shri G.C. Prasad      Deputy Secretary

2. At the outset, the Chairperson welcomed the Members to the Sitting of the Committee convened for consideration and adoption of the following draft Reports: -

- (i) Corporate Social Responsibility in Select CPSUs;
- (ii) Hindustan Organic Chemicals Limited (HOCL); and
- (iii) Action Taken by the Government on the Observations / Recommendations contained in the Sixth Report (Sixteenth Lok Sabha)

of the Committee on Public Undertakings (2014-15) on Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI).

3.     xxxx -----xxxx-----xxxx

4.     xxxx -----xxxx-----xxxx

5.     The Committee thereafter took up for consideration the draft Report on the “Action Taken by the Government on the Observations / Recommendations contained in the Sixth Report (Sixteenth Lok Sabha) of the Committee on Public Undertakings (2014-15) on Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI)” and adopted the same without any changes.

6.     The Committee then authorized the Chairperson to finalise the aforesaid draft Report on the basis of factual verification by Ministries/ Departments concerned and present the same to Parliament.

***The Committee then adjourned.***



## ANNEXURE

*(Vide para 4 of the Introduction)*

### **Analysis of the Action Taken by Government on the Observations/ Recommendations contained in the Sixth Report of the Committee on Public Undertakings (Sixteenth Lok Sabha) on Bharatiya Nabhikiya Vidyut Nigam Limited**

I	Total number of recommendations	08
II	Observations/Recommendations that have been accepted by the Government [Paras No. 1 to 6 and 8]	Total - 07 Percentage - 87.5
III	Observations/Recommendation which the Committee do not desire to pursue in view of Government's replies [Para No. 7]	Total - 01 Percentage - 12.5
IV	Observations/Recommendations in respect of which replies of the Government have not been accepted by the Committee	Total - Nil Percentage - Nil
V	Observations/Recommendations in respect of which final replies of Government are still awaited.	Total - Nil Percentage - Nil