

TWENTY THIRD REPORT
STANDING COMMITTEE ON ENERGY
(1995-96)
(TENTH LOK SABHA)

DEPARTMENT OF ATOMIC ENERGY
DEMANDS FOR GRANTS (1995-96)



Presented to Lok Sabha on..... 21.4.1995
Laid in Rajya Sabha on.....

LOK SABHA SECRETARIAT
NEW DELHI

April, 1995/Vaisakha, 1917 (Saka)

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PART II*

**Record of discussion held with representatives of
Department of Atomic Energy on 18th April, 1995.**

*Not printed. One cyclostyled copy laid on the Table of each of the House and 5 copies placed in Parliament Library.

**COMPOSITION OF THE STANDING COMMITTEE ON ENERGY
(1995-96)**

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Shri Jaswant Singh

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Lok Sabha

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3. **Shri Murli Deora**
4. **Shri Motilal Singh**
5. **Shri Khelsai Singh**
6. **Shri Khelan Ram Jangde**
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24. **Shri Vijay Kumar Yadav**

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34. Shri Dipankar Mukherjee
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36. Smt. Ila Panda
37. Shri J.S. Raju
38. Shri T. Venkatram Reddy
39. Shri Rajni Ranjan Sahu
40. Shri Viren J. Shah
41. Dr. Naunihal Singh
42. Smt. Kamla Sinha

SECRETARIAT

1. Shri S.N. Mishra	—	<i>Additional Secretary</i>
2. Smt. Roli Srivastava	—	<i>Joint Secretary</i>
3. Shri G.R. Juneja	—	<i>Deputy Secretary</i>
4. Shri A. Louis Martin	—	<i>Under Secretary</i>

INTRODUCTION

I, the Chairman of the Standing Committee on Energy having been authorised by the Committee to present the Report on their behalf, present this Twenty Third Report on the Demands for Grants (1995-96) relating to the Department of Atomic Energy.

2. The Committee considered and adopted the Report at their sitting held on 18th April, 1995 and also held discussion with the officials of the Department of Atomic Energy on the same day.

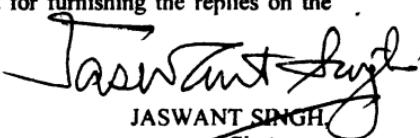
3. The replies furnished by the Department of Atomic Energy on the points contained in this report and also on the points raised by the Committee during their discussion with the representatives of the Department of Atomic Energy on 18th April, 1995 have been appended to the Report.

4. A copy of verbatim proceedings of the discussion held by the Committee with the officials of the Department of Atomic Energy on 18th April, 1995 is also laid in the House alongwith the Report.

5. The Committee wish to thank the representatives of the Department of Atomic Energy who appeared before the Committee and placed their considered views. They also wish to thank the Department for furnishing the replies on the points raised by the Committee.

NEW DELHI;
April 24, 1995

Vaisakha 4, 1917 (Saka)


JASWANT SINGH,
Chairman,
Standing Committee
on Energy.

CHAPTER I

INTRODUCTORY

1. The Committee in their first and ninth reports on Demands for Grants of the Department of Atomic Energy pertaining to the years 1993-94 and 1994-95 respectively had emphasised the aspect of realistic budget estimates. The Committee had observed that over estimates led to a locking up of utilisable funds thereby depriving other deserving projects/schemes of budgetary allocations. The Committee's examination of the current demands for grants and plan budget of the Department reveals that there has been a significant shortfall in utilisation of budget provisions, particularly in respect of plan provisions in all the three sectors of the Department viz., Research and Development, Industry and Minerals and Power. These issues are brought out briefly in the current report.

2. The Committee are constrained to observe that copies of Annual Report of the Department were not furnished to the Committee until the report was finalised on 13th April, 1995. Only one draft copy of the Annual Report was made available on 12th April, 1995. There was also delay in supply of copies of Performance Budget which were received on 10th April, 1994. The Committee expect the Department to ensure in future that the copies of Performance Budget, Annual Report and Budget notes are furnished along with Demands for Grants well in time to enable the Committee to undertake a thorough scrutiny of Demands for Grants.

CHAPTER II

ANALYSIS OF DEMANDS FOR GRANTS AND PLAN BUDGET OF THE DEPARTMENT OF ATOMIC ENERGY

3. The following two Demands for Grants have been submitted to Parliament by the Department of Atomic Energy (DAE) for the year 1995-96:

Demand No. 85

Relating to Secretariat-Revenue and Capital Expenditure on Atomic Energy Research and Development and Industrial Projects

Rs. 1255.11 crores.

Demand No. 86

Relating to Revenue and Capital Expenditure on Nuclear Power

Rs. 816.01 crores

4. The two Demands aggregating to Rs. 2071.12 crores comprise of Rs. 643.00 crores for plan schemes and Rs. 1428.3 crores for non-plan expenditure. In addition, plan schemes to an extent of Rs. 886.73 crores are to be met from Internal and Extra Budgetary Resources. The headwise details of the demands are shown in Appendix-I.

5. The Budget provisions of DAE as observed from the Performance Budget are given below:

						(Rs. in crores)
1994-95						1995-96
	B.E.		R.E.		B.E.	
	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan
Budgetary Support	530	1439	500	1282	643	1428
IEBR	1042	—	679	—	887	—
Total	1572	1439	1179	1282	1529	1428

IEBR—Internal and Extra Budgetary Resources.

6. The above information as given in the Performance Budget of DAE is for a two year period. Obviously, the information is insufficient to make any

meaningful analysis particularly in the absence of figures relating to actual utilisation. The Committee in their ninth report had highlighted the inadequacy of information contained in the Performance Budget. Information bringing out physical and financial performance ought to be given for a three year period in respect of each item of expenditure. The Committee in this connection refer to the Performance Budget and Budget notes furnished by the Ministry of Power which bring out fairly comprehensive and upto date information. The Committee suggest that DAE may consider preparing its budgetary documents on similar lines.

7. The Committee in their ninth report had noted with concern that in successive years, the plan expenditure of the Department has been much less than the budgeted amount. In the year, 1994-95 too, the plan and non-plan expenditure of the Department is expected to fall short of the budgeted amount considerably. The setback in plan activities of the Department is mainly due to non-realisation of the Internal and Extra Budgetary Resources as originally envisaged. The mobilisation of funds under IEBR was just Rs. 679 crores as against the target of Rs. 1042 crores. The Committee stress that the estimates of IEBR should be made on a realistic basis.

Industry & Minerals Sector

8. The resource allocation in respect of the Industries and Minerals Sector has been as under:

							(Rs. in crores)
1993-94			1994-95			1995-96	
	B.E.	Actual	Shortfall (—)	B.E.	R.E.	Shortfall (—)	B.E.
Plan	195	168	(—) 27	205	151	(—) 54	178
Non-Plan	598	546	(—) 52	592	537	(—) 55	595
Total	793	714	(—) 79	797	688	(—) 109	773

The Committee note with concern that the shortfall in utilisation of Budget provisions in the Industries and Minerals Sector was as much as Rs. 79 crores during 1993-94. The shortfall in budgetary utilisation is expected to go up to Rs. 109 crores during 1994-95. The Committee expect the DAE to explain the reasons for the poor budgetary performance of the Industries and Minerals Sector and indicate as to what extent the under utilisation was beyond control.

Nuclear Fuel Complex

9. A statement showing the resources allocation for the Nuclear Fuel Complex is given in Appendix-II.

10. The budgetary provisions and realisations of 'Fuel Fabrication Facilities and others' of the Nuclear Fuel Complex during 1993-94 and 1994-95 and 1995-96 are given below:

	(Rs. in crores)						
	1993-94			1994-95			1995-96
	B.E.	Actual	Shortfall (—)	B.E.	R.E.	Shortfall (—)	B.E.
Fuel Fabrication Facilities and others	100.00	33	(—) 67	100	50	(—) 50	70.00

11. It can be observed from the above statement that the shortfall in utilisation of budgetary provisions of 'Fuel Fabrication Facilities and others' was a staggering Rs. 67 crores during 1993-94 which in percentage terms works out to a shortfall of 67%. What one would have expected of the Department is to reassess the financial requirements realistically in the succeeding year. But this has not happened. It is observed that the reduction in budgetary provision during 1994-95 was as much as Rs. 50 crores which works out to a decline of 50%. The Committee in their first and ninth reports had highlighted the disturbing aspect of under utilisation of budgetary allocations by the Nuclear Fuel Complex. Improvement in budgetary performance of the complex is still not visible. The Committee feel that there is a need to have a relook at the budget planning exercise of the NFC and to take suitable corrective measures as a result thereof.

12. Another area which requires attention is Fuel Inventory in Power Sector which recorded a shortfall of Rs. 97 crores as against the budget estimate of Rs. 235 crores in 1993-94 and reduction of Rs. 72 crores as against the original budgetary provision of Rs. 296 crores during 1994-95. The Committee expect that the reasons for steep shortfall in budgetary utilisation for Fuel Inventory should be gone into in detail and realistic estimates made in future.

Operating Performance

13. The physical performance of Atomic Power Stations in generating power during 1994-95 has been as indicated below:

Atomic Power Station	Gross Generation (MUs)		Capacity factor %	
	Budgeted	Anticipated	Budgeted	Anticipated
Tarapur	1770	1515	63	54
Rajasthan				
Unit I	393	—	45	—
Unit II	1010	410	58	—
Madras	1900	2434	49	63
Narora	2100	952	54	25
Kakrapar	1540	369	51	19

14. The Committee in their ninth report had commented on the poor performance of Narora and Unit II of Rajasthan Atomic Power Stations during 1993-94. The Committee's scrutiny of 1994-95 performance shows that these units continue to fare badly. In addition to these, Tarapur and Kakrapar plants have also recorded shortfall in generating performance. Kakrapar unit has registered the lowest capacity factor of just 19%. The Committee view this phenomenon with considerable concern and dismay. The Committee desire that an exercise should be conducted to identify the problems that plague each unit and effective remedial measures undertaken on a time bound programme to improve the generating performance of atomic power stations.

Progress of Projects

15. The Eighth Plan Outlay and the expected expenditure during the first four years of the plan in respect of certain projects as observed from the Performance Budget are given below:

		8th Plan Outplay	(Rs. in crores) Anticipated expenditure during first four years
<i>Bhabha Atomic Research Centre</i>			
(i) Revamping of PREFRE-I		40	5.97
(ii) Waste Immobilisation plant at Kalpakkam		50	17.86
<i>Indira Gandhi Centre for Atomic Research</i>			
Setting up of prototype Fast Breeder Reactor Project		43.99	15.70

16. The expenditure expected to be incurred during the first four years of the 8th plan in respect of revamping of PREFRE-I, Waste Immobilisation Plant and Prototype Fast Breeder Reactor Project is far below the 8th plan outlay. It appears that there is hardly any possibility of utilising the bulk balance outlay during the terminal year of the 8th plan. The committee would like to be apprised of the reasons for shortfall in utilisation of the 8th plan outlay and slow progress in respect of these projects.

Experimental mining

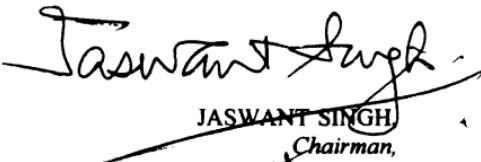
17. The Atomic Minerals Division (AMD) is responsible for exploration of atomic minerals required for the Indian nuclear power programme. The Committee observe that AMD could recover only about 660 tonnes ore as against a target of 15,000 tonnes from experimental mining. No target in this regard has been fixed for the year 1995-96. The Committee would like to know the reasons for not achieving the desired results in experimental mining.

Nuclear Power Programme

18. The Department of Atomic Energy in 1984 had set for itself a target of 10,000 MW of nuclear power capacity by the turn of the century. To meet the requirements in this regard advance action was taken after all cabinet approvals had been granted. Consequently for procuring various items ingeniously orders were also placed. It, however, appears that the programme has since been abandoned. The present programme is to achieve a total nuclear installed generating capacity of 2820 MW by the year 1997. The Committee feel that this abandoning of the action plan had many adverse consequences. A great deal of damage has been done to our indigenous effort and to the industry. The Committee are of the view that a complete explanation on this matter is owed by the Government. The Committee's views about Nuclear Power, as an answer to our power shortage have been explicitly stated many times. The Committee, therefore, while demanding such an explanation recommend that adequate, and needed budgetary support must be provided to meet the requirements of nuclear power programmes of the DAE.

NEW DELHI;
April 24, 1995

Vaisakha 4, 1917 (Saka)


JASWANT SINGH
Chairman,
Standing Committee
on Energy.

**STATEMENT OF CONCLUSIONS/RECOMMENDATIONS OF THE
STANDING COMMITTEE ON ENERGY CONTAINED IN THE REPORT**

Sl. No.	Reference No. of the Report	Para 2	Conclusions/Recommendations 3
1			
1	2		<p>The Committee are constrained to observe that copies of Annual Report of the Department were not furnished to the Committee until the report was finalised on 13th April, 1995. Only one draft copy of the Annual Report was made available on 12th April, 1995. There was also delay in supply of copies of Performance Budget which were received on 10th April, 1994. The Committee expect the Department to ensure in future that the copies of Performance Budget, Annual Report and Budget notes are furnished along with Demands for Grants well in time to enable the Committee to undertake a thorough scrutiny of Demands for Grants.</p>

2 5 The Budget provisions of DAE as observed from the Performance Budget are given below:

	(Rs. in crores)					
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IEBR—Internal and Extra Budgetary Resources.

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1

2

3

expenditure. The Committee in this connection refer to the Performance Budget and Budget notes furnished by the Ministry of Power which bring out fairly comprehensive and upto date information. The Committee suggest that DAE may consider preparing its budgetary documents on similar lines.

3

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The Committee in their ninth report had noted with concern that in successive years, the plan expenditure of the Department has been much less than the budgeted amount. In the year, 1994-95 too, the plan and non-plan expenditure of the Department is expected to fall short of the budgeted amount considerably. The setback in plan activities of the Department is mainly due to non-realisation of the Internal and Extra Budgetary resources as originally envisaged. The mobilisation of funds under IEBR was just Rs. 679 crores as against the target of Rs. 1042 crores. The Committee stress that the estimates of IEBR should be made on a realistic basis.

4

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1	2	3
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1	2	3	(Rs. in crores)
		8th Plan Outlay	Anticipated expenditure during first four years
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	(ii) Waste Immobilisation plant at Kalpakkam	50	17.86
Indira Gandhi Centre for Atomic Research			
Setting up of prototype Fast Breeder Reactor Project		43.99	15.70

16		The expenditure expected to be incurred during the first four years of the 8th plan in respect of revamping of PREFRE-I, Waste Immobilisation Plant and Prototype Fast Breeder Reactor Project is far below the 8th plan outlay. It appears that there is hardly any possibility of utilising the bulk balance outlay during the terminal year of the 8th plan. The committee would like to be apprised of the reasons for shortfall in utilisation of the 8th plan outlay and slow progress in respect of these projects.
9	17	The Atomic Minerals Division (AMD) is responsible for exploration of atomic minerals required for the Indian nuclear power programme. The Committee observe that AMD could recover only about 660 tonnes ore as against a target of 15,000 tonnes from experimental mining. No target in this regard has been fixed for the year 1995-96. The Committee would like to know the reasons for not achieving the desired results in experimental mining.
10	18	The Department of Atomic Energy in 1984 had set for itself a target of 10,000 MW of nuclear power capacity by the turn of the century. To meet the requirements in this regard advance action was taken after all cabinet approvals had been granted. Consequently for procuring various items indegeniously orders were also placed. It, however, appears that the programme has since been abandoned. The present programme is to

achieve a total nuclear installed generating capacity of 2820 MW by the year 1997. The Committee feel that this abandoning of the action plan had many adverse consequences. A great deal of damage has been done to our indigenous effort and to the industry. The Committee are of the view that a complete explanation on this matter is owed by the Government. The Committee's views about Nuclear Power, as an answer to our power shortage have been explicitly stated many times. The Committee, therefore, while demanding such an explanation recommend that adequate, and needed budgetary support must be provided to meet the requirements of nuclear power programmes of the DAE.

APPENDIX I

DEMANDS FOR GRANTS OF THE DEPARTMENT OF ATOMIC ENERGY

(Rs. in Crores)													
Sl. No.	Major Head	1993-94 Actuals		1994-95		1995-96		Remarks					
		B.E.		R.E.		B.E.							
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan						
1	2	3	4	5	6	7	8	9	10	11			
Demand No. 85													
<i>Revenue Section</i>													
1.	3451	—	4.4	—	5.13	—	5.13	—	5.18	This head comprises of items like salaries etc. of Sectt. & Atomic Energy Commission.			
13	2. 2852	5.00	201.87	5.00	216.98	5.00	194.66	—	215.77	This head comprises of items like R&D, Bhabha Atomic Research Centre, Nuclear Fuel Complex, Heavy Water Board, Fuel Reprocessing Plants, Industry & Extension Programme and Support Services.			
3	3401	46.92	285.12	47.47	307.24	47.09	306.63	55.47	312.13	This head comprises of items like R&D, Bhabha Atomic Research Centre, Aided Institutions, Nuclear Power Programme support services, contribution to International Atomic Energy Agency.			

1	2	3	4	5	6	7	8	9	10	11
<i>Capital Section</i>										
4.	4425	—	—	—	0.01	—	0.01	—	0.01	This head comprises of items like investment in co-operative societies/canteens.
5.	4859	1.00	—	1.00	—	1.00	—	1.00	—	This head comprises of items like Electronics Corp. of India Ltd. Investment.
6.	4861	153.08	338.72	198.00	374.84	143.73	342.39	176.00	379.06	This head comprises of items like Bhabha Atomic Research Centre, Nuclear Power programme, Nuclear Fuel Canteen, Heavy Water Board, Power Projects, Fuel Reprocessing Industry & Extension Programme.
7.	5401	60.2412	—	77.53	—	102.04	—	109.53	—	This head comprises of items like Bhabha Atomic Research Centre, Nuclear Power Programme, Support Services, Directions and Administrations.
8.	6859	1.00	5.00	1.00	—	1.00	—	1.00	—	This head comprises of items like loan to Electronics Corporation of India Ltd.
9.	7475	—	0.15	—	0.2	—	0.2	—	0.14	This head comprises of items like loans to cooperative societies.
<i>Demand No. 86</i>										
<i>Revenue Section</i>										
10.	2801	—	348.52	—	534.63	—	433.09	—	516.01	This head comprises of items like Power Projects, Waste Management.
11.	4801	175.93	—	200.00	—	200.00	—	300.00	—	This head comprises of items like Power Projects.

Demand No. 85
 Adjustment of Recoveries as reduction of expenditure.

<i>Revenue Section</i>							
12. 2852	(-)5.00	(-)0.043	(-)5.00	(-)1.43	(-)5.00	(-)2.79	(-)1.33
13. 3401	(-)5.00	(-)3.13	(-)5.00	(-)5.92	(-)5.00	(-)6.41	(-)5.04
<i>Capital Section</i>							
14. 4861	—	(-)72.77	—	(-)79.42	—	(-)67.09	(-)67.91
15. 5401	—	—	—	(-)0.01	—	—	—

APPENDIX II

RESOURCES ALLOCATION FOR NUCLEAR FUEL COMPLEX

Demand No. 8, Major Heads 2852, 4881

Sl. No.	Units/ Programme	1993-94		1994-95		1995-96		(Rs. in Crores)					
		B.E.	Actual	(-) Shortfall (+) Excess	B.E.	R.E.	B.E.	B.E.	Difference between R.E. 1994-95 & B.E. 1995-96				
1	2	3	4	5	6	7	8	9	10				
1.	Operational Expenses of Fuel Plant	(NP)	154	125	(-)	29	131.46	113.14	(-)	18.32	132.92	(+)	19.78
2.	Operational Expenses of Stainless Steel Seamless Tubes Plant.	(NP)	6.5	3.7	(-)	2.8	4.8	3.8	(-)	1	4.6	(+)	0.8
3.	Operational Expenses of Ball Bearing Steel Tubes Plant	(NP)	4.4	3.2	(-)	1.2	3.7	3.2	(-)	(0.5)	3.5	(+)	(0.2)
4.	Estate Manage- ment: Hydera- bad.	(NP)	1.5	1.5	0.00	168.00	158.00	(-)	10	163.00	(+)	7	

1	2	3	4	5	6	7	8	9	10
5.	Grant-in-aid (NP)	1.2	1.2	0.00	135.00	130.00	(-)	5	140.00
6.	Departmental Canteen (NP)	0.00	0.0	0.00	0.00	0.00	0.00	0.5	(+) 0.5
7.	Fuel Fabrication Facili- ties and others	(P) 100.00	33	(-)	67	100.00	50	(-) 50	70.00
								(+)	20
P.	100.00	33	(-)	67	100.00	50	(-)	50	70.00
NP	168.00	134	(-)	34	143.00	123	(-)	20	144.00
Total	268.00	167	(-)	101	243.00	173	(-)	70	214.00

P: Plan
NP: Non Plan

APPENDIX III

REPLIES TO THE POINTS CONTAINED IN THE COMMITTEE'S REPORT FURNISHED BY THE DEPARTMENT OF ATOMIC ENERGY

Introductory Chapter of the Committee's Report

Observations of the Committee

Para 1. The Committee in their first and ninth reports on Demands for Grants of the Department of Atomic Energy pertaining to the years 1993-94 and 1994-95 respectively had emphasised the aspect of realistic budget estimates. The Committee had observed that over estimates led to a locking up of utilisable funds thereby depriving other deserving projects/schemes of budgetary allocations. The Committee's examination of the current demands for grants and plan budget of the Department reveals that there has been a significant shortfall in utilisation of budget provisions, particularly in respect of plan provisions in all the three sectors of the Department viz., Research and Development, Industry and Minerals and Power. These issues are brought out briefly in the current report.

Comments of the Department (Para 1)

The approved outlay and the projected expenditure for the year 1994-95 under the three sectors of the Department are furnished below:—

Sector	Approved Outlay	(Rs. in crores) Projected Expenditure
R & D	125	149.13
I & M	263.73	185.95
Power	1183.00	844.00

From the above it would be seen that the expenditure under R&D Sector is in excess of the approved outlay. Under I&M Sector there has been a shortfall in utilisation of approved outlay mainly because of rephasing of implementation of the fuel production facilities of Nuclear Fuel Complex (NFC), consequent upon the reduced nuclear power generation programme of Nuclear Power Corporation of India Ltd. (NPCIL). The detailed analysis of this is given in para 11 of Chapter-II of this report. Incidentally, it may be mentioned that the savings available under I&M Sector were partially utilised for the increased demand under R&D Sector.

During 1994-95 as against a play outlay of Rs. 1183 crores, only Rs. 200 crores has been provided as the budgetary support and the balance amount of Rs. 983 crores was to be mobilised by borrowing from the capital market. The expenditure during 1994-95 is expected to be lower than the budgeted amount mainly due to the delay in commencement of TAPP 3 & 4 as a result of budgetary constraints and also due to temporary slowing down of the activities in Kaiga and RAPP 3 & 4 during the course of investigation relating to Kaiga incident.

Observations of the Committee

Para 2. The Committee are constrained to observe that copies of Annual Report of the Department were not furnished to the Committee until the report was finalised on 13th April, 1995. Only one draft copy of the Annual Report was made available on 12th April, 1995. There was also delay in supply of copies of Performance Budget which were received on 10th April, 1994. The Committee expect the Department to ensure that in future the copies of Performance Budget, Annual Report and Budget Notes are furnished along with demands for Grants well in time to enable the Committee to undertake a thorough scrutiny of Demands for Grants.

Comments of the Department (Para 2)

The observations of the Committee are noted for future compliance. The preparation of Performance Budget and the Annual Report of the Department involves collection of data from various units of the Department of Atomic Energy numbering 30 spread all over India. During the current financial year, the Ministry of Finance has issued orders changing the standard object heads of classification of expenditure and also standardisation of account heads and changes in the pattern of alpha code system into numerical codes. This has resulted in delay in preparation of the Demands for Grants of the Department based on which the Performance Budget of the Department is prepared. Incidentally, it may also be mentioned that the final plan outlay for the Department was communicated by the Planning Commission by the end of Feb. 1995 with the result the finalisation of Budget Proposals including the Performance Budget of the department was delayed. Further, during the scrutiny of the Performance Budget of the Department by the Parliamentary Committee in 1994-95, some changes in the presentation of the Performance Budget, were suggested. Based on these suggestions, the presentation of Performance Budget during the year has been made.

As regards Annual Report of the Department, it includes the achievements of the Department in a particular year upto the last date of the financial year with the result that the scientific translation/updation of data for preparation of Annual Report can be taken up only from 1st April of the following year which also results in delay in submission of the document.

Analysis of Demands for Grants and Plan Budget of the Department of Atomic Energy

Observations of the Committee

Para 3: The following two Demands for Grants have been submitted to Parliament by the Department of Atomic Energy (DAE) for the year 1995-96:—

Demand No. 85

Relating to Secretariat-Revenue and)	
Capital Expenditure on Atomic Energy)	Rs. 1255.11 crores
Research and Development and Industrial)	
Projects.		

Demand No. 86

Relating to Revenue and Capital Expen-)	
diture of Nuclear Power.		Rs. 816.01 crores

Comments of the Department (Para 3)

The amounts shown against Demand No. 85 relating to Secretariat-Revenue and Capital Expenditure on Atomic Energy—Research & Development and Industrial Project is only towards the voted portion of the expenditure. In addition, a charged expenditure of Rs. 0.18 crores also to be included making the total amount under the grant to Rs. 1255.29 crores.

Observations of the Committee

Para 4: The two Demands aggregating to Rs. 2071.12 crores comprise of Rs. 643.00 crores for plan schemes and Rs. 1428.3 crores for non-plan expenditure. In addition, plan schemes to an extent of Rs. 886.73 crores are to be met from Internal and Extra Budgetary Resources. The headwise details of the demands are shown in Appendix-I.

Comments of the Department (Para 4)

Taking into account the correction suggested in comments of the Department of para-3, the amounts shown in first line of para-4 may be read as Rs. 2071.30 crores instead of Rs. 2071.12 crores.

Observations of the Committee

Para 5: The Budget provisions of DAE as observed from the Performance Budget are given below:—

	(Rs. in crores)					
	1994-95				1995-96	
	B.E.		R.E.		B.E.	
	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan
Budgetary Support	530	1439	500	1282	643	1428
IEBR	1042	—	679	—	887	—
Total	1572	1439	1179	1282	1530	1428

IEBR—Internal and Extra Budgetary Resources.

Para 6: The above information as given in the Performance Budget of DAE is for a two year period. Obviously, the information is insufficient to make any meaningful analysis particularly in the absence of figures relating to actual utilisation. The Committee in their ninth Report had highlighted the inadequacy of information contained in the Performance Budget. Information bringing out physical and financial performance ought to be given for a three year period in respect of each item of expenditure. The Committee in this connection refer to the Performance Budget and Budget Notes furnished by the Ministry of Power which bring out fairly comprehensive and upto date information. The Committee suggest that DAE may consider preparing its budgetary documents on similar lines.

Comments of the Department (Paras 5 & 6)

The suggestions of the Committee are noted for compliance. The information relating to last three years is furnished below:—

	(Rs. in Crores)								
	1991-92			1992-93			1993-94		
	Budget	Actuals	% Utili- sation	Budget	Actuals	% Utili- sation	Budget	Actuals	% Utili- sation
Plan	412.14	354.42	86.00	412.00	356.42	86.51	743.00	701.61	94.42
Non-plan	1108.79	935.51	84.37	1145.53	1042.21	91.02	1315.12	1183.80	90.00
Total	1520.93	1289.93	84.81	1557.53	1399.63	89.83	2058.12	1885.41	92.21

Observations of the Committee

Para 7: The Committee in their ninth report had noted with concern that in successive years, the plan expenditure of the Department has been much less than the budgeted amount. In the year 1994-95 too, the plan and non-plan expenditure of the Department is expected to fall short of the budgeted amount considerably. The set back in plan activities of the Department is mainly due to non-realisation

of the Internal and Extra Budgetary Resources as originally envisaged. The mobilisation of funds under IEBR was just Rs. 679 crores as against the target of Rs. 1042 crores. The Committee stress that the estimates of IEBR should be made on a realistic basis.

Comments of the Department (Para 7)

At the time of formation of NPCIL, it was agreed by the Government that the first 50% of the investment in the future projects would be provided through budgetary support as equity and the balance would be mobilised by NPCIL through market borrowings. However, due to budgetary constraints the budgetary support, in successive years has been far short of the eligible budgetary support of the Nuclear Power Sector.

During the year 1994-95, as against the budgetary support of Rs. 1005 crores proposed by the Department, only Rs. 184 crores was approved as budgetary support for NPCIL in BE 94-95 and the IEBR was enhanced to Rs. 983 crores. However, NPCIL has been requesting the Government to reconsider the budgetary support and has requested that the budgetary support for 1994-95 may be augmented to at least Rs. 500 crores. In view of the above, IEBR has been shown in the Revised Estimate of 1994-95 as Rs. 644 crores as against Rs. 983 crores shown in the Budget Estimate.

Observations of the Committee

Industry and Minerals Sector

Para 8: The resource allocation in respect of the Industries and Minerals Sector has been as under:—

(Rs. in crores)							
	1993-94			1994-95		1995-96	
	B.E.	Actual	Shortfall (—) Excess (+)	B.E.	R.E.	Difference	B.E.
Plan	195	168	(—) 27	205	151	(—) 54	178
Non-Plan	598	546	(—) 52	592	537	(—) 55	595
Total	793	714	(—) 79	797	688	(—) 109	773

The Committee note with concern that the shortfall in utilisation of Budget provisions in the Industries and Minerals Sector was as much as Rs. 79 crores during 1993-94. The shortfall in budgetary utilisation is expected to go up to Rs. 109 crores during 1994-95. The Committee expect the DAE to explain the reasons for the poor budgetary performance of the Industries and Minerals Sector and indicate to what extent the under utilisation was beyond control.

Comments of the Department (Para 8)

The shortfall in plan expenditure under I&M Sector, is mainly due to rescheduling implementation of expansion of existing facilities of Nuclear Fuel Complex (NFC). A detailed analysis of same is furnished against paras 10 and 11 of this report.

The Table given below indicates the Gross budget figures, receipts projected and net outflow of cash in Budget Estimates and Revised Estimates 1994-95:—

			(Rs. in crores)
	Gross Budget Proposed	Receipts Projected	Net Outflow of cash
Approved B.E. 94-95	904.40	271.08	633.32
R.E. Projected by the Department	926.80	215.53	711.27
R.E. approved by the Min. of Finance	849.02	215.53	633.49

It would be seen from the above that in order to keep the budgetary deficit to the minimum level, the Ministry of Finance have cut the approved Non-plan provision to the extent the receipts of the Department have gone down in the revised estimates so that the net out-flow of cash, which was Rs. 633 crores in BE 94-95 would be kept at the same level in RE 94-95 (Rs. 633.00 approximately). The main reason for reduction in receipts of the Department is less receipts anticipated from NFC towards cost of PHWR fuel fabricated by them. NFC had to reduce the production of PHWR fuel due to reduced requirement by NPCIL for their power stations. Further, the production facilities of NFC also were shutdown for a period of three months for annual maintenance. Accordingly, a net expenditure of Rs. 633.49 crores only (*i.e.* Gross expenditure of Rs. 849.02 crores minus anticipated receipts of Rs. 215.53 crores) has been approved by the Ministry of Finance, resulting in the enforced surrender of Rs. 55.38 crores in Non-plan expenditure during 94-95 out of the approved provision.

Observations of the Committee

Nuclear Fuel Complex

Para 9: A statement showing the resource allocation for the Nuclear Fuel Complex is given in Appendix II.

Para 10: The budgetary provisions and realisation of "Fuel Fabrication Facilities and others" of the Nuclear Fuel Complex during 1993-94 and 1994-95 are given below:

	(Rs. in crores)						
	1993-94			1994-95			1995-96
	B.E.	Actual	Shortfall (—)	B.E.	R.E.	Shortfall (—)	B.E.
Fuel Fabrication Facilities and others	100.00	33	(—) 67	100	50	(—) 50	70.00

Para 11: It can be observed from the above statement that the shortfall in utilisation of budgetary provisions of "Fuel Fabrication Facilities and others" was a staggering Rs. 67 crores during 1993-94 which in percentage terms works out to a shortfall of 67%. What one would have expected of the Department is to reassess the financial requirements realistically in the succeeding year. But this has not happened. If it is observed that the reduction in budgetary provision during 1994-95 was as much as Rs. 50 crores which works out to a decline of 50%. The Committee in their first and ninth reports had highlighted the disturbing aspect of under utilisation of budgetary allocations by the Nuclear Fuel Complex. Improvement in budgetary performance of the Complex is still not visible. The Committee feel that there is a need to have a relook at the Budget planning exercise of the NFC and to take suitable corrective measures as a result thereof.

Comments of the Department (Paras 9, 10 & 11)

Financial sanction for new projects were issued in Aug. 1992, keeping in view the Nuclear Power Programme of 6050 MWe generation target. On the above basis the Budget provision for 1993-94 was made. However, due to slowing down of the Nuclear Power Programme as a result of the financial crunch, the implementation of the newly sanctioned projects of NFC viz., New Uranium Oxide Fuel Project, New Uranium Fuel Assembly Plant and New Zircaloy Fabrication Plant was re-phased and only 50% of the capacities are being added in the first phase. As a result, the funds provided in the Budget for 1993-94 could not be fully utilised. Phase-I of the Nuclear Fuel Expansion Programme of NFC to a capacity of 300 tonnes of fuel production per year is under implementation which is to be completed in a phased manner by July, 1996. However, the time available due to re-phasing of the implementation of the expansion programme has given an opportunity for increased/further indigenisation of equipment and machinery required thereby saving a large amount of foreign exchange as well as leading to a reduction in the cost of the project. Taking advantage of this, a good amount of indigenisation of capital equipment such as Annealing Furnaces, Sintering Furnaces, End Cap Welding Machines, fuel assembly machine, etc., has been made. Since this involved design and also identification of suitable vendors

within the country, the pace of the project work was slightly slowed down. However, in view of the indigenisation, it has been possible to bring down the project cost substantially by about Rs. 125 crores from the initially contemplated figure of Rs. 355 crores.

Since the redesign to suit the indigenisation process has been completed and majority of the equipments have already been ordered, it is expected that two of the projects will be completed in Dec. 1995, and the third one in July, 1996.

Observations of the Committee

Para 12: Another area which requires attention is Fuel Inventory in Power Sector which recorded a shortfall of Rs. 97 crores as against the Budget estimate of Rs. 235 crores in 1993-94 and a reduction of Rs. 72 crores as against the original budgetary provision of Rs. 296 crores during 1994-95. The Committee expect that the reasons for steep shortfall in budgetary utilisation for Fuel Inventory should be gone into in detail and realistic estimates made in future.

Comments of the Department (Para 12)

The shortfall in expenditure under the Head 'Fuel Inventory' is mainly due to the fact that the contract for supply of enriched uranium had expired and it took some time for entering into a fresh contract from an alternate supplier from a different country.

Observations of the Committee

Operating Performance

Para 13: The physical performance of Atomic Power Stations in generating power during 1994-95 has been as indicated below:—

Atomic Power Station	Gross Generation (MUs)		Capacity factor %	
	Budgeted	Anticipated	Budgeted	Anticipated
Tarapur	1770	1515	63	54
Rajasthan				
Unit I	393	—	45	—
Unit II	1010	410	58	—
Madras	1900	2434	49	63
Narora	2100	952	54	25
Kakrapar	1540	369	51	19

Para 14: The Committee in their ninth report had commented on the poor performance of Narora and Unit-II of Rajasthan Atomic Power Stations during 1993-94. The Committee's scrutiny of 1994-95 performance shows that these units continue to fare badly. In addition to these, Tarapur and Kakrapar Plants have also

recorded shortfall in generating performance. Kakrapar unit has registered the lowest capacity factor of just 19%. The Committee view this phenomenon with considerable concern and dismay. The Committee desire that an exercise should be conducted to identify the problems that plague each unit and effective remedial measures undertaken on a time bound programme to improve the generating performance of atomic power stations.

Comments of the Department (Paras 13 and 14)

Physical Performance

The physical performance of generation from Atomic Power Stations for the year 1994-95 (budgeted, anticipated and actual) and targets for the year 1995-96 are given below:—

Unit	1994-95				1995-96			
	Budgeted		Anticipated		Actual		Target	
	Gen.	C.F.	Gen.	C.F.	Gen.	C.F.	Gen.	C.F.
Tarapur	1770	63	1515	54	1517	54	1600	57
Rajasthan-1	393	45	-	-	-	-	-	-
Rajasthan-2	1010	58	410	70#	410	70#	-	-
Madras	1900	49	2434	63	2432	63	1950	65@
				(82)@			(82)@	
Narora	2100	54	952	25	952	25	2368	61
Kakrapar	1540*	51	369	19	358	19	1933**	57

*During 1994-95, Kakrapar-2 target of 560 MUs included from September 1994.

#Capacity factor upto 31st July, 1994, when Rajasthan-2 was shut down for capital maintenance for inservice inspection of its coolant channels and enmasse replacement.

** During 1995-96, Kakrapar-2 target of 723 MUs included from 1 July 1995.

@ Capacity factors of Madras Units based on the restricted maximum operating power level of 2 x 170 MWe.

Generating Performance 1994-95

Madras Unit

Madras 1&2 units exceeded the budget target by about 28%. The station achieved a capacity factor of 63% based on a rating of 2 x 220 MWe and 82% based on the restricted maximum operating power level of 2 x 170 MWe.

Tarapur Units

Tarapur unit-2 generated 971 MUs and recorded a capacity factor of 69%. However, Tarapur Unit-1 did not meet the target and contributed to the shortfall. The refuelling outage of Unit-1 got extended by 2 months upto 12 July, 1994 for repairing the bypass line of the recirculation loop and motor operated valves in the shut down cooling system. The Unit-1 also encountered problems with its turbine

main oil pump leading to outages from 14th July to 15th Aug. 1994, and from 13th Sept. to 24th Nov. 1994, as the failed parts of this imported equipment had to be replaced after indigenising the same. Tarapur unit-1 generated 546 MUs with a capacity factor of 39%. This contributed to the shortfall in the actual generation from this station as compared to budgeted figures.

Rajasthan Units 1&2

Rajasthan Unit-1 was shut down throughout 1994-95 because of a minor but difficult heavy water leak in the Over Pressure Relief Device (OPRD) mounted on its calandria. The difficulty in repair arises due to inaccessibility of the location. The techno-economic assessment of continued operation of this first PHWR is being done having regard to the end shield and OPRD problems and health of the coolant channels.

Rajasthan Unit-2 was shut down from 1st Aug. 1994 for inservice inspection of its coolant channels and their enmasse replacement which is expected to take about three years.

Narora Units 1&2

After the fire incident in unit-1 of Narora Station on 31st March, 1993, the unit-1 after rehabilitation was expected to come back on line in July, 1994 and budgeted target was made accordingly. However, the Unit-1 could come back on line only on 6 Jan. 1995. The rehabilitation work was of a challenging nature involving major jobs like dismantling the damaged turbine generator, its replacement, civil works in the turbine hall, rerouting of control and power cables, strengthening of fire barriers, repairing and cleaning the turbine condenser, testing and commissioning of all the systems before restart of the unit. These jobs took more time than originally envisaged due to their complexities and were completed in a period of about 21 months. The manner in which the incident was handled, and the subsequent rehabilitation and improvements carried out indigenously, have received international acclaim. Narora Unit-2 was already on line during the year after the rehabilitation consequent on the damage to common systems caused by the fire incident in unit-1. The Unit-2 encountered three long outages from 12 Sept. to 2 Nov. 1994, 11 Dec. to 25 Dec. 1994 and 28th Jan. to 9 April 1995, all outages being attributable to problems with its turbine generator, such as shroud and blade failures in the HP rotor, and high bearing temperatures. In addition this unit suffered several short duration outages due to high grid frequencies. These factors were the main contributors to the shortfall.

Kakrapar Units 1&2

A target of 560 MUs budgeted for Kakrapar Unit-2 from Sept. 1994, could not materialise, as the Kakrapar Unit-2 actually achieved first criticality on 8.1.1995

as against the date of 31.1.1994 assessed at the time of preparation of Budget. It was synchronised to the grid on 4 March, 1995 and is expected to become commercial from 1 July 1995. The unit is presently operating at 90 MWe based on the AERB authorisation level of 50%. Kakrapar Unit-1 was shutdown in Feb. 1994 for inspection of its turbine and incorporating modifications required as a result of the lessons learnt from the fire incident at Narora. This shutdown was prolonged till 28 October 1994, partly because of delays caused by the flood incident in June 1994, due to unprecedeted rains and also adjustments of the main generator end shields for hydrogen leak tightness. The unit also suffered a few short duration outages due to grid disturbances. These are the main contributory factors for the shortfall.

Prospects 1995-96

The Department notes the comments of the Committee for compliance. A target of 7851 MUs has been budgeted for 1995-96. With actions already taken on the modifications of the turbine generators, and stabilisation of the Narora and Kakrapar units, it is expected that performance of these units would improve. Tarapur Unit-2 will take a long outage for inspection of the core shroud for cracks, based on international reports of cracks encountered in U.S. BWRs. Rajasthan Units 1 &2 will continue to be shut down due to reasons mentioned above. The performance of the indigenous turbine generators has been cause for concern, affecting all the operating PHWRs. This matter has been taken up with Bharat Heavy Electricals Ltd. (BHEL) and a joint task force with members NPCIL and BHEL has been constituted for reviewing and resolving the problems.

Regarding grid frequency variations, the matter is being taken up at various levels with concerned agencies such as State and Regional Electricity Boards. Implementation of islanding schemes is also planned for some of the stations to isolate the unit during grid disturbance and operate on dedicated loads. However, implementation of such schemes is a long term process due to involvement of several agencies and special requirements related to implementing such schemes.

Strengthening the condition monitoring, preventive and predictive maintenance, and ongoing training of O&M personnel are other measures underway for improvement.

Observations of the Committee

Progress of Projects

Para 15: The Eight Plan Outlay and the expected expenditure during the first

four years of the plan in respect of certain projects as observed from the Performance Budget are given below:—

		(Rs. in crores)
	8th Plan Outlay	Anticipated Expdr. during first four years
<i>Bhabha Atomic Research Centre</i>		
i) Revamping of PREFRE-I	40	5.97
ii) Waste Immobilisation Plant at Kalpakkam	50	17.86
<i>Indira Gandhi Centre for Atomic Research</i>		
Setting up of Prototype Fast Breeder Reactor Project	43.99	15.70

Para 16. The expenditure to be incurred during the first four years of the 8th Plan in respect of revamping of PREFRE-I, Waste Immobilisation Plant and Prototype Fast Breeder Reactor Project is far below the 8th Plan outlay. It appears that there is hardly any possibility of utilising the bulk balance outlay during the terminal year of the 8th Plan. The Committee would like to be apprised of the reasons for shortfall in utilisation of the 8th Plan outlay and slow progress in respect of these projects.

Comments of the department (Paras 15 and 16)

The present status of the projects of BARC and IGCAR is explained below:—

Revamping of PREFRE-I

The project was originally to be started in 1993-94. However, on a critical review of the design of the project, the original estimate of Rs. 58 crores was revised to Rs. 46 crores and the project was sanctioned only in Dec. 1993. The work on the project was taken up from 1994-95 only. This is partly responsible for the delay. In the first year, the detailed design of the building and the engineering design of process equipment and piping was projected. The work on this has actually taken place in 1994-95 and is in progress. Similarly, procurement action for bulk materials like Stainless Steel Plates and Pipes has been initiated. The civil works relating to auxiliary buildings and underground drainage have also been started. In the year 1995-96 procurement action for bulk materials and supplies will be in progress. Similarly, detailed engineering of process equipment and piping as well as civil works will be in progress. It is expected that budget provision of Rs. 5 crores will be utilised during the year. In the year 1996-97 civil works will be in full swing and detailed engineering design of the process system will be completed. A provision of Rs. 7.5 crores would be needed in the year 1996-97. A provision of Rs. 13.47 crores may be utilised during the 8th Plan against approved plan outlay of Rs. 40 crores.

Waste Immobilisation Plant, Kalpakkam

The conceptual design of the main plan for the project was based on the design used for the Waste Immobilisation Plant at Tarapur, the first plant to be commissioned in India, entirely through indigenous effort in the year 1988. Based on the inputs from the operational experience of Tarapur Plant, innovations in the design and plant layout in the Waste Immobilisation Plant were effected. Redesign of the plant layout and the process equipments etc., the construction of the main plant building started in 1993-94. The storage building meant for the storage of the waste product after processing will be taken up after the construction of the main plant has reached an advanced stage. Construction of housing for the plant staff will commence thereafter. An expenditure of Rs. 10 crores each is estimated in the year 1995-96 and 1996-97. The total Plan outlay likely to be utilised during the VIII Plan will be Rs. 27.86 crores against Rs. 50 crores approved for the VIII Plan period.

Setting up of Prototype Fast Breeder Reactor

The main reasons for shortfall in the expenditure expected during the VIII Plan period are summarised below:—

- a) There have been delays in procurement of imported raw materials.
- b) To reduce overall cost of the project, design changes have been made which would affect the technology development of important components.
- c) Delay in manufacture for technology development by Indian Industries on account of high tech. work involved.

However, efforts are on hand to review all the capital projects of the Centre at regular intervals to expedite and speed up the activities.

Observations of the Committee

Experimental Mining

Para 17: The Atomic Minerals Division (AMD) is responsible for exploration of atomic minerals required for the Indian nuclear power programme. The Committee observe that AMD could recover only about 660 tonnes ore as against a target of 15,000 tonnes from experimental mining. No target in this regard has been fixed for the year 1995-96. The Committee would like to know the reasons for not achieving the desired results in experimental mining.

Comments of the Department (Para 17)

The physical target and the achievements under the head 'mining programme' during last three years have been as under:—

Year	Target	Achievements	(figures in tonnes)
1992-93	258	168	
1993-94	120	145	
1994-95	-	660	

It is regretted that during the year 1994-95 no target was indicated in our Performance Budget and that in the Performance Budget for the year 1995-96 an unrealistic figure of 15000 tonnes has inadvertently been indicated as target for the year 1994-95.

APPENDIX IV

Replies to the Points Raised by the Committee during the discussion held with the Representatives of Department of Atomic Energy

1. Long Term Perspective For Nuclear Power

The demand for electrical power generation in the country will be in the range of 150,000 MWe by the year 2005 AD and will be 300,000 to 400,000 MWe by 2020 AD. With increasing emphasis on clean power technologies which do not contribute to Greenhouse gases and problem of ash accumulation and considering limited resources of coal as also the strain that coal movement places on transport (railways) systems, etc., it is to be expected that India will have to rely significantly on power generation from nuclear technology in the 21st Century. This phenomenon is not unique to India. Significant additions of power generation using nuclear power technology is already being witnessed in China, South Korea (ROP) and other countries in the East Asian region.

Though a programme to implement 10,000 MWe of nuclear power, based on estimated uranium resources was drawn up sometimes ago, the same had to be significantly scaled down in view of funds constraint. A Committee appointed by Secretary, DAE and Chairman, AEC has reviewed the present scenario and is expected to submit a report addressing various issues and suggest a minimum programme, for making the nuclear power programme self-supporting.

Considering the present resource constraints, the long term strategy should include:

- (a) Pursuit of indigenous technology of PHWRs; and
- (b) Import of LWRs from countries like Russia and France without compromising our stand on NPT and safeguards.

In pursuing PHWR technology, while completing KAIGA 1&2 and RAPP-3&4, the technology development launched for 500 MWe nuclear power reactor in mid 80's must be given vigorous support for implementation of TAPP 3&4. It is also to be recognised that RAPS-2 is presently shut down for inspection and enmasse coolant channel retubing and some safety related upgradations. MAPS 1 & 2 will have to be taken up for similar works subsequently before long. TAPS 1 & 2 will need MOX fuel. Actions in this direction have already been taken. India has a large amount of Thorium resources. In order to utilise the same, the PFBR

(Prototype Fast Breeder Reactor) project of 500 MWe capacity has to be taken up before the turn of the century.

As far as imported technologies are concerned, based on the financial packages (credit) that can be worked out with supplier countries 1000 MWe-VVERs from Russia, or PWRs from any other source could be considered, if the safeguards are limited to the supplied plants under bilateral agreements.

2. Rajasthan Atomic Power Station 1-2 and Atomic Power Projects 3 & 4

Rajasthan Unit-1 was commissioned in 1972 and Unit-2 in 1980. Rajasthan Unit-1 developed a light water leak in the endshield which was repaired indigenously by developing remote maintenance technique. Later on Unit-1 developed a leak in the Over Pressure Relief Device (OPRD). Rajasthan Unit-2 operated with a lifetime capacity factor of around 60%.

The coolant tubes of the Pickering reactor in Canada are reported to have failed in 1983 due to coolant tube-calandria tube contact. This necessitated an enmasse coolant channel replacement at Pickering after inservice inspection. To avoid a similar incident the coolant channels in the Indian reactors are being inspected regularly using indigenously developed inservice inspection tools.

Unit-2 was shut down for the inservice inspection from 1st August, 1994. After the inspection it is likely that the enmasse coolant channel replacement would have to be done on Unit 2. This is expected to take 3 years at the end of which the Unit is expected to come on line during 1998. Inspection for Unit 1 is also to be carried out. Procedures to remotely rectify the OPRD leaks of this Unit are being drawn.

Rajasthan Units 3 and 4 were expected to be operational by 1997 as per schedule. But because of the delamination of a part of the inner dome at Kaiga, the work on the reactor building civil work is currently suspended. This will start in a few months with a new design. But the rest of the construction work is going on as per schedule. Based on the current status of investigation/redesign of the Reactor building inner containment dome, the original schedule may be delayed by 9-12 months.

3. Present Status on Rehabilitation Plan Consequent to Kaiga Inner Containment Dome Delamination Incident

The reports of the committees constituted by Atomic Energy Regulatory Board (AERB) and Nuclear Power Corporation of India Limited (NPCIL) for investigating into the cause of the incident at Kaiga-1 are yet to be received. In the meanwhile, all possible activities aimed at expeditious rehabilitation of the Kaiga inner containment dome have progressed.

A revised design of the dome taking into consideration all possible contributing factors has been worked out and the same has been sent for proof checking to an independent French Consultant, who has been appointed recently. This will help in finalising the drawings with least time delay by incorporating further modifications, if any, suggested by the investigation committees at a later date.

The dismantling of the dome itself is a massive job, to be executed with utmost care so as to ensure the safety of the people working in the vicinity and also to ensure that in the dismantling process, the structure that has to be retained is not affected. The demolition procedure for the dome has been established.

The present schedule is to take up this work in September 1995 (immediately after the monsoon) and complete casting of the dome by May 1996 (before the onset of monsoon). Construction of the dome for Kaiga-2 will also be taken up in parallel during the same period. Priority has also been given for the work of erecting the pump room crane which is required for erecting the primary heat transport pump motors and other heavy equipments without affecting the above schedule on the dome. It is expected that it would also be possible to release revised drawings after meeting all the regulatory requirements to meet the above schedule.

Based on the status of activities in the other areas of the project, attainment of criticality of Unit-1 by February 1997 (as compared to present target of June 1996) appears feasible based on an action plan for undertaking a number of activities concurrently. The position with regard to dismantling and reconstruction of dome will be reviewed continuously based on developments from time to time and AERB review to compress the schedule to the extent feasible.

In regard to Kaiga-2, the hold by AERB on the civil construction of inner containment dome is in force. However, no dismantling of the existing dome structure is anticipated as in Kaiga-1. It is expected that the criticality of Kaiga-2 can be achieved by September 1997 (as compared to the present target of December 1996).

4. Narora Atomic Power Station Unit-1—Rehabilitation

A fire incident took place in Narora Atomic Power Station at about 0330 hours on 31st March, 1993. As per the findings of the two committees, one constituted by the Nuclear Power Corporation, another by Atomic Energy Regulatory Board, the failure of two blades in the 5th stage of the low pressure turbine due to fatigue and detachment at the root has been the initiating event for the fire. These blades caused damages to other blades of the turbine which was rotating at high speed. The resulting imbalance of the machine led to the failure of the oil seals and the hydrogen seals of the generator which caused the fire. The operating staff responded exceedingly well to the situation.

The incident took place in a turbine building physically separated from the reactor. There was no physical injury or death in this incident. There was also no spread of radioactive contamination whatsoever or radiation injury. This incident of fire due to the failure at the route of the turbine blades is not unique to India. Similar incidents have occurred in other countries also. The functioning of the thermo-syphon system provided the necessary cooling, offering protection to the core. It is worth mentioning that this aspect was studied during the time of safety evaluation of the particular reactor and thermo-syphon capability was demonstrated as a part of commissioning experiment. It is gratifying to note that the system behaved as intended during the incident.

The two committees, mentioned earlier have carried out detailed review and made recommendations on the incident.

The Turbo-generator foundation and adjoining civil structures were restored to their original condition by employing carefully evolved repair procedures. A new Turbo-generator with modified upgraded L.P. rotor was installed at NAPS-1.

All the affected cables were replaced with modified layout to give better segregation. Modified fire barriers have been installed and cables vented with fire retardant paint. The affected portion of busduct were replaced. All the fire affected control panels and instruments were rehabilitated.

After completing the rehabilitation work including modifications, as per recommendations of the two committees, approval was obtained from AERB for restart of the unit. The reactor was made critical on December 22, 1994 and synchronised to grid on January 6, 1995. Since then, till March 31st, 1995, the unit has produced around 186 million units of energy. As on 17.4.1995, NAPS-1 & NAPS-2 are operating at 195 MWe and 190 MWe of power respectively. The work of rehabilitation of NAPS-1 was highly appreciated even by the U.S. Nuclear Regulatory Commission Team which visited the Power Station in February, 1995.

5. Waste Immobilisation Plant

Waste Immobilisation Plant (WIP) is a facility which comes in the downstream of a Fuel Reprocessing Plant. Almost the entire fission product activity contained in the highly radioactive spent fuel discharged by the reactors is released in the form of liquid waste during reprocessing. In WIP this waste is further concentrated, conditioned and mixed with molten glass of a carefully chosen composition and then solidified—the process which is called Vitrification. This solid glass acts as a matrix for immobilising the waste and it should have the stability to withstand the decay heat generated by the waste incorporated in it as well as be resistant to leaching even if it is accidentally exposed to ground water when it is disposed in a deep geological repository.

Only very few countries in the world are having this waste technology and that too restricted to those having reprocessing capability. India is one among them having built the first technology demonstration Plant at Tarapur totally indigenously.

It calls for a complex engineering design with remotisation of operation as well as remote maintenance and repair capability using gadgets such as servo-manipulators, master slave manipulators, special optical viewing systems, etc. The heart of the vitrification process is glass melter and with the accumulation of operating experience from the Tarapur Plant and based on the R&D efforts towards bringing about innovations in the technology it has become possible to improve upon the design of the melter which has been adopted in the Kalpakkam WIP with consequent changes in the layout of the plant. This has resulted in some delay in the finalisation of the plant design as a whole and hence there has been a shortfall in the utilisation of allocated funds. This delay is proposed to be made good to ensure that it does not in anyway affect the commissioning and operation of the fuel reprocessing plant for which this WIP (Kalpakkam) is mainly supposed to cater to.

6. Prototype Fast Breeder Reactor (PFBR)

The second stage of nuclear programme is devoted for development of FBR technology and its associated fuel cycle. A Fast Breeder Test Reactor of 40 MWt capacity is already operational using a novel fuel of mixed carbide of plutonium and uranium in the Indira Gandhi Centre for Atomic Research at Kalpakkam. The reactor has reached a power level of about 10 MWt and the fuel has performed well reaching high levels of burnup. The heat from the reactor at present is removed by sodium, producing steam through a heat exchanger. It is expected that the steam will be utilised in the near future to generate electrical power to the grid as soon as the teething problem related to turbine supplied by BHEL is overcome.

Arising out of the experience, it was proposed to build a power reactor of a 500 MWe Prototype Fast Breeder Reactor at Kalpakkam. A preliminary design report and feasibility report was prepared as per the directions of the Steering Committee & Working Group constituted for this purpose by the Chairman, AEC in 1980. The design is currently being reviewed to make PFBR economically attractive taking into consideration the development taking place and experience gained all over the world. A technology development programme is in progress for trial manufacture of critical components to overcome uncertainties arising out of scale up of the reactor. Because of the large size of the reactor, engineering development in certain areas became necessary. A Reactor Engineering Lab has been set up for testing of large size components in high temperature sodium. Other studies being made are Thermo hydraulics of the sodium cooling system, flow induced vibration studies, studies relating to development of large size pumps for the sodium circuit. It is proposed to seek financial sanction after two years when the major design and experimental work are likely to be completed. Work is also being pursued in certain areas of fuel cycle to a limited extent.

For the technology development, an amount of Rs. 43.99 cr. has been provided in the VIII Plan for fabrication of critical components related to main vessel, inner vessel, evaporator and re-heater and primary sodium pump, control rod

mechanism and invessel transfer mechanism. These involved import of special raw materials, such as, special steels, etc. These are manufactured by only a few foreign firms and the quality required for them is of high standard. There is a considerable difficulty faced to, resulting in delay in finalising the procurement, because these involved critical testing of materials, etc. Similarly, the equipment and components to be fabricated have to meet high standards of fabrication and quality. Familiarising the manufacturers with procedures and requirements and qualifying them has taken rather more time, which has resulted in delay in placing orders. In cases where orders have been placed there is a necessity for qualifying their procedures, workers in areas needing specialised skill such as special welding, precision machining at every stage which again has resulted in delay in procurement.

APPENDIX V

MINUTES OF FOURTH SITTING OF THE STANDING COMMITTEE ON ENERGY, HELD ON TUESDAY, THE 18TH APRIL, 1995.

The Committee sat from 14.30 hrs. to 16.30 hrs.

PRESENT

Shri Jaswant Singh — *Chairman*

MEMBERS

2. Smt. Lovely Anand
3. Shri Anil Basu
4. Shri Chitta Basu
5. Shri Dalbir Singh
6. Shri Murli Deora
7. Shri Khelan Ram Jangde
8. Shri Haradhan Roy
9. Shri Khelsai Singh
10. Shri Laxminarain Tripathi
11. Prof. Rita Verma
12. Shri Parmeshwar Kumar Agarwalla
13. Shri Dipankar Mukherjee
14. Shri M. Rajasekara Murthy
15. Smt. Kamla Sinha

SECRETARIAT

1. Smt. Roli Srivastava	—	<i>Joint Secretary</i>
2. Shri G.R. Juneja	—	<i>Deputy Secretary</i>
3. Shri A. Louis Martin	—	<i>Under Secretary</i>

The Committee first considered and adopted the draft report on Demands for Grants (1995-96) of Department of Atomic Energy.

- 2. Thereafter, the Committee held a detailed discussion with the representatives of the Department of Atomic Energy on the report on Demands for Grants (1995-96) of the Department. A list of representatives of the Department of Atomic Energy who were present during the discussion is given in Annexure. A copy of the verbatim proceedings of the discussion is kept on record.

3. The Committee also authorised the Chairman to finalise the report on receipt of replies from the Department of Atomic Energy on points raised during discussion and present the same to Parliament.

The Committee then adjourned.

**ANNEXURE TO THE MINUTES OF THE SITTING OF THE
COMMITTEE HELD ON TUESDAY, THE 18TH APRIL, 1995.**

List of Representatives of the Department of Atomic Energy

Sl. No.	Name	Designation
1.	Dr. R. Chidambaram	— <i>Chairman, AEC and Secretary, Department of Atomic Energy</i>
2.	Shri A.N. Prasad	— <i>Director, BARC</i>
3.	Shri Y.S.R. Prasad	— <i>Managing Director, NPCIL</i>
4.	Shri K.K. Sinha	— <i>Chief Executive, NFC</i>
5.	Shri G.R. Balasubramanian	— <i>Technical Advisor, DAE</i>
6.	Shri V. Ranganathan	— <i>Joint Secretary</i>
7.	Shri B.K. Saha	— <i>Joint Secretary</i>
8.	Shri Rahul Sarin	— <i>Joint Secretary</i>
9.	Shri R.C. Joshi	— <i>Executive Dir. (F), NPCIL</i>
10.	Shri K.B.S. Chopra	— <i>Chief Controller of Accounts</i>
11.	Shri P.C. Thomas	— <i>Consultant</i>