



सत्यमेव जयते

**PARLIAMENT OF INDIA**  
**RAJYA SABHA**

DEPARTMENT-RELATED PARLIAMENTARY STANDING COMMITTEE  
ON SCIENCE AND TECHNOLOGY, ENVIRONMENT AND FORESTS

**THREE HUNDRED FOURTEENTH REPORT**

**Demands for Grants (2018-19)**  
**of the Department of Atomic Energy**  
**(Demand No. 4)**

*(Presented to the Rajya Sabha on 13th March, 2018)*  
*(Laid on the Table of Lok Sabha on 13th March, 2018)*



**Rajya Sabha Secretariat, New Delhi**  
**March, 2018/Phalguna, 1939 (Saka)**

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## COMPOSITION OF THE COMMITTEE

(2017-18)

(Constituted on 1st September, 2017)

1. Shri Anand Sharma — *Chairman*

### **RAJYA SABHA**

2. Shri Prasanna Acharya
3. Shri S.R. Balasubramoniyam
4. Shrimati Renuka Chowdhury
5. Shri Rajkumar Dhoot
6. Shri C.P. Narayanan
7. Shri Parimal Nathwani
8. Shri Sharad Pawar
9. Dr. T. Subbarami Reddy
10. Shri Bhupender Yadav

### **LOK SABHA**

11. Maulana Badruddin Ajmal
12. Shri Muzaffar Hussain Baig
13. Shri E.T. Mohammed Basheer
14. Shri Pankaj Chaudhary
15. Shri P.P. Chauhan
16. Kumari Sushmita Dev
17. Shri Ninong Ering
18. Shri Laxman Giluwa
19. Dr. K. Gopal
20. Shrimati Vasanthi M.
21. Shri Daddan Mishra
22. Shri Prabhubhai Nagarbhai Vasava
23. Shri Chirag Paswan
24. Shri Shivaji Adhalrao Patil
25. Shri Harinarayan Rajbhar
26. Shrimati Sandhya Roy
27. Shri Kirti Vardhan Singh
28. Shri Nagendra Singh
29. Shri Vikram Usendi
- <sup>1</sup>30. Vacant
- <sup>2</sup>31. Vacant

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<sup>1</sup> Shri Nagendra Kumar Pradhan ceased to be a member of the Committee w.e.f. 12th December, 2017.

<sup>2</sup> Shri Nana Patole ceased to be a member of the Committee consequent upon his resignation from the Lok Sabha w.e.f. 14th December, 2017.

(ii)

**SECRETARIAT**

Shrimati Sunita Sekaran, *Director*

Shri T.N. Pandey, *Director*

Shri S. Rangarajan, *Additional Director*

Shri Mohd. Salamuddin, *Additional Director*

Shri Rajiv Saxena, *Under Secretary*

## INTRODUCTION

I, the Chairman of the Department-related Parliamentary Standing Committee on Science & Technology, Environment & Forests, having been authorised by the Committee to present the Report on its behalf, present this Three Hundred Fourteenth Report of the Committee. This Report deals with the detailed Demands for Grants (2018-2019) of the Department of Atomic Energy (Demand No. 4).

2. In the meeting of the Committee held on 19th February, 2018, the Secretary and other officers of the Department of Atomic Energy gave an overview of the various activities of the Department and the Members sought clarifications on various aspects of the performance of the Department to enable it to scrutinise the Demands for Grants.

3. The Committee expresses its thanks to the officers of the Department for replying to the clarifications sought by the Members and placing before it the required material to enable the Committee to scrutinise the Demands for Grants of the Department of Atomic Energy.

4. The Committee considered and adopted the Report in its meeting held on the 6th March, 2018.

NEW DELHI;  
6 March, 2018  

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Phalguna 15, 1939 (Saka)

(ANAND SHARMA)  
Chairman,  
Department-related Parliamentary Standing Committee on  
Science and Technology, Environment and Forests,  
Rajya Sabha.

## ACRONYMS

AEC	:	Atomic Energy Commission
AEES	:	Atomic Energy Education Society
AMD	:	Atomic Minerals Directorate for Exploration and Research
BARC	:	Bhabha Atomic Research Centre
BHAVINI	:	Bharatiya Nabhikiya Vidyut Nigam Ltd.
BRIT	:	Board of Radiation and Isotope Technology
BRNS	:	Board of Research in Nuclear Sciences
CERN	:	Centre for Nuclear Research
DAE	:	Department of Atomic Energy
ECIL	:	Electronics Corporation of India Ltd.
FBR	:	Fast Breeder Reactors
HBNI	:	Homi Bhabha National Institute
HRI	:	Harish-Chandra Research Institute
HWB	:	Heavy Water Board
IAEA	:	International Atomic Energy Agency
IEBR	:	Internal and Extra Budgetary Resources
IGCAR	:	Indira Gandhi Centre for Atomic Research
IICHEP	:	Inter-Institutional Centre for High Energy Physics
IMSc	:	Institute of Mathematical Sciences
INO	:	India-based Neutrino Observatory
IOP	:	Institute of Physics
IPR	:	Institute for Plasma Research
IREL	:	Indian Rare Earths Ltd.
ITER	:	International Thermonuclear Experimental Reactor
LIGO	:	Laser Interferometer Gravitational Observatory
MCI	:	Medical Council of India
MSBTE	:	Maharashtra State Board of Technical Education



NBHM	:	National Board for Higher Mathematics
NCPW	:	Nuclear Control and Planning Wing
NFC	:	Nuclear Fuel Complex
NISER	:	National Institute of Science Education and Research
NITI Aayog	:	National Institution for Transforming India
NPCIL	:	Nuclear Power Corporation of India Ltd.
PFBR	:	Prototype Fast Breeder Reactor
R&D	:	Research & Development
RRCAT	:	Raja Ramanna Centre for Advanced Technology
SHRI	:	Sludge Hygienisation Research Initiative
SINP	:	Saha Institute of Nuclear Physics
TIFR	:	Tata Institute of Fundamental Research
TMC	:	Tata Memorial Centre
UCIL	:	Uranium Corporation of India Ltd.
VECC	:	Variable Energy Cyclotron Centre
WHO	:	World Health Organisation

# REPORT

## INTRODUCTION

1.1 The Department of Atomic Energy (DAE) came into being on August 3, 1954, and has been engaged in the development and deployment of nuclear power technology, application of radiation technologies in the field of agriculture, health care, industry and basic research. The Atomic Energy Commission (AEC) is the apex body for formulation of policies and direction of the programmes. The Commission implements its policies and programmes through the Department of Atomic Energy (DAE). The Programmes of DAE have been divided into four sectors *viz.* Research & Development, Industries, Minerals and Power Sectors.

1.2 The programmes being followed by DAE, can be briefly summed up as, increasing the share of nuclear power through deployment of indigenous and other proven thermal reactor technologies and also developing fast breeder reactors and thorium reactors with associated fuel cycle facilities; building and operation of research reactors for production of radioisotopes; developing radiation technology applications in the field of health care, agriculture and industry; designing and developing advanced technologies such as accelerators, lasers, supercomputers, advanced materials and instrumentation and encouraging transfer of technology to industry; providing support to basic research in nuclear energy and related frontier areas of science in universities and academic institutions; supporting academic programmes having a bearing on DAE's activities; and International cooperation in related advanced areas of research and contribution to national security.

## 2. VISION OF THE DAE

2.1 The vision of the DAE is to empower India through technology, creation of more wealth and improving standard of living of its citizens. To realise its vision, the Department has been engaged in the design, construction and operation of nuclear power/research reactors and the associated nuclear fuel cycle technologies across the country.

2.2 NITI Aayog has also identified following 10 targets to be achieved by the Department:-

- (i) First stage of Indian Nuclear Power Programme

Creation of 2.5 to 3 GWe (average capacity) per year for next 15 to 20 years.

- (ii) Uranium and Rare Metals- Exploration, mining and milling Target : Tenfold rise in exploration and production of uranium and rare earths to achieve self-sufficiency.

- (iii) Second stage of Indian Nuclear Power Programme Target : Tenfold rise in power from Fast Breeder Reactors (FBR) and creation of matching fuel cycle facilities in the back end.

- (iv) Health Care

Affordable cancer care for 5 lakh new patients per year and decreasing the cancer mortality rate by 15%

- (v) Food Security

Creation of networks and Facilities to provide food security through nuclear agriculture and food preservation for 10% of the Indian population.

## vi) Water and Waste Management

Management of Municipal waste in 50 cities and providing water purification facilities for 20000 villages.

## vii) Mega Science Schemes

Completion and utilisation of various accelerator programmes, India-based Neutrino Observatory (INO), Laser Interferometer Gravitational Observatory (LIGO), European Centre for Nuclear Research (CERN), International Thermonuclear Experimental Reactor (ITER) etc.

## viii) Basic Research and Science Education

Pursuing curiosity driven basic research programmes for understanding the fundamental nature of processes, creation of knowledge base and science education.

## ix) Directed Research

R&D activities directed towards achieving specific objectives of the Department in the nuclear and allied fields.

## x) Social Outreach and Awareness

Creation of network for need based social outreach activities in and around the Department facilities and step up awareness programmes for target audience.

### 3. MAJOR PROGRAMMES

3.1 Over the years, the Department has been able to establish a network of institutions engaged in R&D as well as industrial activities and acquired expertise in all aspects of the nuclear fuel cycle.

3.2 The share of nuclear power in the total electricity generation so far remained around 3% with nuclear generation growing at about the same rate as that of electricity generation in the country. With the completion of large number of nuclear power projects sanctioned and planned in the future, the share is expected to rise progressively.

3.3 At present, NPCIL is spearheading India's Nuclear Power Programme with 22 Nuclear Power Reactors in operation, with total installed capacity of 6780 MW (including RAPS-1 of 100 MW of DAE). Currently NPCIL is constructing six Reactors (4800 MW) comprising of KAPP 3&4 (2x700 MW, PHWRs), RAPP-7&8(2x700MW. PHWRs) and KKNPP-3&4 (2x1000 MW, LWRs) which are under various stages of construction. Administrative Approval and Financial Sanction is available for construction of GHAVP-1&2 (2x700 MWPHWRs). Recently in June 2017, Govt. of India has accorded Administrative Approval and Financial Sanction for construction of 10 indigenous PHWRs of 700 MW in fleet mode and also for KKNPP-5&6 (2x1000 Mw, LWRs) with Russian Co-operation. Pre-project activities are at various stages of progress at these sites which are prerequisites for commencement of construction. Pre-project activities at the other sites, accorded 'in principle' approval by the Government of India have been taken up progressively.

3.4 The DAE is also developing advanced technologies such as accelerators, lasers, super computers, advanced materials and instrumentation and encouraging transfer of technology to the industry, which

could contribute to the national prosperity. A wide range of technologies have been developed to come to the present stage of harnessing nuclear energy and efforts are continuing to develop such technologies further with future requirements in mind. Technologies to be developed for future applications include those necessary for building accelerator driven sub-critical reactor system (ADS), high temperature reactor systems and fusion technologies. Several applications of radiation and isotope technologies for improving the quality of life have been developed and efforts on this front are to be continued.

3.5 The Department is also engaged in the development of radiation technologies and their applications for better crop varieties, techniques for crop protection, radiation-based post harvest technologies, techniques for radio diagnosis and radio therapy of diseases particularly cancer, technologies for safe potable water, better environment and industrial growth.

3.6 The DAE contributes to the enrichment of knowledge domain by pursuing basic research in nuclear energy and related frontier areas of science; interaction with universities and academic institutions; support to research and development project having a bearing in DAE's programmes, and international co-operation in related advanced areas of research.

3.7 **The Committee notes with satisfaction that in the last sixty four years of its existence, the Department of Atomic Energy has mastered a host of highly complex technologies particularly in the field of R&D, medical radiology, nuclear agriculture, desalination, food irradiation, radio astronomy, supercomputing, particle accelerators, plasma and cryogenics. True to the visions of Dr. Homi J. Bhabha and Jawaharlal Nehru of envisaging the usage of atomic energy to make a difference to the social life of Indians, the DAE should now strive to scale it up and take it to the next level. The Committee feels that the share of nuclear power which is hovering around only three percent of India's total electricity generation, needs to be increased to higher proportions and earnest efforts should be made in that direction.**

#### 4. ORGANISATIONS/INSTITUTIONS/CENTRES/PSUS

The DAE, over the years, has established a vast network of institutions and evolved into a broad-based organisation comprising research centres, industrial units, Public Sector Undertakings and fully aided autonomous institutions along with service organisations. These organisations are engaged in research, technology development and commercial operations in the areas of nuclear power and associated technologies, radiation technologies and their applications, basic research and academic programmes to support, sustain and carry forward its avowed objectives and activities. So far, it has established 107 installations spread across several States of the country. The organisations/institutions under the ambit of DAE, category-wise, are as follows:

- **Research Centres:** Bhabha Atomic Research Centre (BARC)– Mumbai; Indira Gandhi Centre for Atomic Research (IGCAR)– Kalpakkam; Raja Ramanna Centre for Advanced Technology (RRCAT)– Indore; Variable Energy Cyclotron Centre (VECC)– Kolkata; Atomic Minerals Directorate for Exploration and Research (AMD) – Hyderabad; and Global Centre for Nuclear Energy Partnership (GCNEP), Gurgaon.
- **Industrial Organisations:** Heavy Water Board (HWB) – Mumbai; Nuclear Fuel Complex (NFC) – Hyderabad; and Board of Radiation and Isotope Technology (BRIT) – Mumbai.

- **Service Organisations:** Directorate of Purchase & Stores (DPS) – Mumbai, Directorate of Construction, Services and Estate Management (DCSEM) – Mumbai; and General Services Organisation (GSO) – Kalpakkam.
- **Public Sector Undertakings:** Nuclear Power Corporation of India Ltd. (NPCIL)– Mumbai; Bharatiya Nabhikiya Vidyut Nigam Ltd. (BHAVINI); Kalpakkam, Tamil Nadu; Uranium Corporation of India Ltd. (UCIL)– Jaduguda; Indian Rare Earths Ltd. (IREL)– Mumbai; and Electronics Corporation of India Ltd. (ECIL)– Hyderabad.
- **Aided Institutions:** Tata Institute of Fundamental Research (TIFR) – Mumbai; Tata Memorial Centre (TMC) – Mumbai; Saha Institute of Nuclear Physics (SINP) – Kolkata; Institute of Physics (IOP) – Bhubaneswar; National Institute of Science Education and Research (NISER) – Bhubaneswar; Harish-Chandra Research Institute (HRI) – Allahabad; Institute of Mathematical Sciences (IMSc) – Chennai; Institute for Plasma Research (IPR) – Ahmedabad; and Atomic Energy Education Society (AEES) – Mumbai.
- DAE through Board of Research in Nuclear Sciences (BRNS) and National Board for Higher Mathematics (NBHM), and Homi Bhabha National Institute (HBNI) Promotes research in nuclear and allied fields and mathematics, respectively.
- Academic programmes run by BARC, IGCAR, RRCAT, VECC, SINP, IPR, IOP, NISER, IMSc, HRI and TMC come under the fold of Homi Bhabha National Institute, a deemed University. TIFR is also a deemed university. Centre for Excellence in Basic Sciences (CBS) conducts its academic programmes under Mumbai University.
- Additionally this, Department of Atomic Energy has created Nuclear Control and Planning Wing (NCPW). Under this wing following divisions have been formed: Safeguards, Safety and Security Division, International Collaboration & Planning Division, External Relations Division, Nuclear Law Division.

## 5. GRANTS AND EXAMINATION OF GRANTS

5.1 The detailed Demand for Grants (Demand No. 4) of the Department of Atomic Energy for the year 2018-2019 was considered by the Department-related Parliamentary Standing Committee on Science & Technology, Environment & Forests in its meeting held on the 19th February, 2018.

5.2 For effective outcome oriented monitoring of implementation of programmes and schemes/projects and to ensure optimum utilization of resources, a comprehensive exercise to rationalize Plan and Non-Plan schemes of Department has been undertaken by Ministry of Finance. The existing programmes and schemes have been reorganized into outcome-based Umbrella programmes and schemes.

## 6. FINANCIAL PERFORMANCE IN THE LAST THREE YEARS.

6.1 A comparison of the B.E. allocation, R.E. allocation and Actual expenditure incurred by the Department for the last three years is given below:

(₹ in crore)

Year	Budget Estimate	Revised Estimate	Actual Expenditure	% Utilization against RE allocation
2015-16	16945.09	17234.33	16380.66	(95.09%)
2016-17	18682.48	18591.86	18238.36	(98.00%)
2017-18	19616.44	20583.41	16036.63	(78.01%)

(as on 31.01. 18)

6.2 After examination of B.E. and R.E. allocations *vis-à-vis* Actual Expenditure for last three financial years *i.e.* 2015-16, 2016-17 and 2017-18 (up to 31st January, 2018) of the Department of Atomic Energy, it is observed that the Department had utilised 95 and 98 percents of the allocated funds in the years 2015-16 and 2016-17 respectively. The utilisation of funds in 2015-16 was 95.09% which improved to 98.00% in 2016-17.

**6.3 The Committee observes that on the whole, financial performance of the Department has been satisfactory. The Committee finds that the Department has been able to utilise more than 95% of allocated RE funds, in the years 2015-16 and 2016-17. However, the Committee feels that there is still some scope for improvement. The Committee, therefore, recommends the Department to make a firm resolve and intensify its efforts to ensure that maximum utilisation of resources is ensured.**

#### 7. UTILISATION OF THE APPROVED OUTLAY IN 2017-18

7.1 Category-wise details of Budgetary support and Revised Expenditure in 2017-18 of the Department are as under:-

(₹ in crore)

Categories	BE 2017-18	RE 17-18	Actual utilization upto Jan 18
Establishment Expenditure	7159.39	8037.17	7109.61
Central Sector Scheme	9613.69	8630.45	6083.00
Other Central Sector Scheme:			
(a)Autonomous Bodies	2179.38	1997.81	1758.82
(b)Public Sector Undertaking	620.00	1874.00	1085.00
Contribution to IAEA	43.98	43.98	0.20
<b>Total</b>	<b>19616.44</b>	<b>20583.41</b>	<b>16036.63</b>

7.2 During the meeting, held on 19th February, 2018 to examine the Demands for Grants of the Department, the Committee was informed by the Department that, the Department had proposed the Ministry of Finance

to allocate ₹ 27056.00 crore but finally approved BE 2017-18 allocation was ₹ 19616.44 crore. Similarly, at RE 2017-18, the Department had proposed to allocate ₹ 26,605.73 crore to the Ministry of Finance. However, the Department was allocated ₹ 20,583.41 crore which is ₹ 6022.32 crore less than the projected amount.

7.3 The Committee was also informed that many major projects were likely to be affected due to cut in allocation at RE 2017-18 stage. For instance, provision under R&D projects are reduced; upcoming projects under Industries & Minerals Sector projects could not be funded as per their progress. It was also informed by the Secretary that there was no provision in the RE 2017-18 allocation for the upcoming cancer facilities in Punjab, Andhra Pradesh and Uttar Pradesh, etc. However, the Secretary informed that any reduction under organisation and management expenditure of the units would adversely affect the Plant and Cancer Research facilities. It was further informed that provision towards the credit to Russia from nuclear Power Corporation of India Limited had also been reduced.

**7.4 The Committee takes serious note of less disbursement of financial allocation in Industries & Minerals and R&D Sectors against the projected amount and the adverse effect that reduced allocation is having on crucial programmes of the Department such as Industries & Minerals Sector programmes and leading research Institutions like Indira Gandhi Centre for Research & Development and Tata Memorial Cancer Centre.**

**7.5 The Committee, therefore, is of the opinion that the well thought out programmes and proposed demands of a crucial Department such as the Department of Atomic Energy should not face drastic cuts in funds allocation. Similarly, reduction of funds to leading R&D units like IGCAR and Cancer hospitals, delays the endeavour of these institutions in achieving their main objective of harnessing atoms for the societal benefit. The Committee recommends that in order to enable the Department to achieve its targets in the field of Nuclear energy, appropriate budgetary allocations should be made keeping in view the fact that Nuclear Energy is a highly capital intensive sector. The Committee also recommends that in future the Ministry of Finance should consider national security and R&D needs while finalising allocation for the Department.**

7.6 Scheme/Programme-wise BE and RE allocation and actual utilisation for 2017-18 (till December, 2017) is given in the table below:

(₹ in crore)				
Sl. No.	Description	Budget 2017-2018	Revised 2017-2018	Actuals upto December 2017
	Establishment Expenditure of the Centre			
1.	Secretariat	49.65	55.91	40.26
2.	Atomic Energy Regulatory Board	60.38	72.79	56.79
3.	Bhabha Atomic Research Centre	1,977.03	2,327.45	1,833.37

Sl. No.	Description	Budget 2017-2018	Revised 2017-2018	Actuals upto December 2017
4.	Indira Gandhi Centre for Atomic Research	396.6	485.00	359.32
5.	Raja Ramanna Centre for Advanced Technology	254.84	295.21	242.91
6.	Variable Energy Cyclotron Centre	102.44	120.4	93.2
7.	Atomic Minerals Directorate for Exploration and Research	266.89	313.3	243.47
8.	Fuel Cycle Facility	464.6	511.8	386.9
9.	Service Units	344.57	423.76	308.82
10.	Board of Radiation and Isotope Technology	79.26	85.81	65.8
11.	Management Services Group	0.58	0.66	0.52
12.	Nuclear Fuel Complex	1,982.37	2,300.34	1,869.81
13.	Heavy Water Production Facility	1,180.18	1,044.74	816.62
Central Sector Schemes/Projects				
14.	R and D Basic Science and Engineering	1,033.32	833.11	584.32
15.	R & D for Fast Reactor Science and Technology	295.37	227.00	177.95



Sl. No.	Description	Budget 2017-2018	Revised 2017-2018	Actuals upto December 2017
16.	Advanced Technologies for Laser, Synchrotron and Accelerator	153.53	152.53	105.6
17.	R and D in Exploration and Mining	123.9	87.06	59.44
18.	Grants to other organisation (BRNS)	163.84	118.56	103.58
19.	Backend Fuel Cycle Projects	539.00	350.00	235.11
20.	Housing Projects	220.15	136.26	103.75
21.	Neighbourhood Development Project (in Kudankulm)	21.00	130.00	21.00
22.	Heavy Water Board	46.2	35.5	29.16
23.	Feedstock	1,174.00	1,223.18	909.00
24.	Heavy Water Pool Management	1,285.00	1,355.00	1,285.00
25.	Radiation and isotopes Project	124.5	55.15	51.64
26.	Nuclear Power Projects	75.9	56.9	54.36
27.	Nuclear Fuel Projects	156.95	156.95	111.04
28.	AERB Expansion Project	27.23	9.00	7.07
29.	Advanced Technology for Accelerator	77.5	71.3	35.35
30.	DAE R and D Projects	321.14	157.69	103.33

Sl. No.	Description	Budget 2017-2018	Revised 2017-2018	Actuals upto December 2017
31.	DAE I and M Projects	73.89	55.00	26.00
32.	Fuel Cycle Projects FRFCF	420.00	420.00	299.81
33.	Nuclear Fuel Inventory	3,281.26	3,000.26	1,195.16
Other Sector Expenditure				
34.	Autonomous Bodies	2,179.38	1,997.81	1,696.62
Public Sector Undertaking				
35.	Nuclear Power Corporation of India Limited	370.00	1,435.00	885.00
36.	Uranium Corporation of India Limited	200.00	439.00	200.00
37.	Bharatiya Nabhikaya Vidyut Nigam Limited	50.00	0	0
Others				
38.	Contribution to International Atomic Energy	43.98	43.98	0.2
Total		19616.44	20583.41	14597.28

7.7 The Committee desired to know about the schemes where funds have remained unutilised. In response thereto, the Department has furnished sector-wise fund utilisation. According to them, it constitute 78.01 % of the RE allocations. The Department was hopeful that remaining 22% allocation can be spent during the last quarter of 2017-18 once approvals are received.

7.8 The Committee desired to know about the categories wherein allocated funds have remained underutilized in the year 2017- 18 along with the reasons. In response thereto, the Department informed that the expenditure up to January 2018 registered to the tune of ₹16036.63 crore against RE of ₹ 20583.41 crore which is 78%.

7.9 When the Committee desired to know the roadmap of spending remaining allocation, the department provided the following information.

<b>Details of Expenditure in February and March, 2018</b>	
<hr/>	
Balance under Revenue Section	₹ 2818.05 Crore
<hr/>	
(a) Pay & allowances for February	₹350.00 crore
(b) O&M Expenditure for 2 months	₹900.00 crore
(c) Fuel imports & supplies to NPCIL	₹1300.00 crore
(d) Releases to Neighbourhood development	₹109.00 crore
(e) GIA salary sought through IV batch	₹248.00 crore
<hr/>	
Balance under Capital Section	₹1725.37 crore
<hr/>	
(a) Loan released to NPCIL in February	₹550.00 crore
(b) Investment reassessed to UCIL in February	₹200.00 crore
(c) HW book adjustment for Feedstock	₹200.00 crore
(d) Expenditure on capital projects for February & March	₹775.00 crore
<hr/>	

7.10 After analysing the figures, the Committee finds that actual utilisation up-to 31 January, 2018, is ₹ 16036.63 crore against RE of ₹ 20583.41 crore which is 78% of Revised Estimates with two months left for utilising allocated amount.

7.11 Breaking the figures further, the Committee finds that in Establishment Expenditure Sector, total ₹ 8037.17 crore were allocated to the Department at RE 2017-18 but up-to January, 2018, it could utilise ₹ 7109.61 crore which is 88% of total allocation. However, situation is worse in contribution to International Atomic Energy Agency sector, wherein the Department was allocated ₹ 43.98 crore at BE stage which was maintained at the same level at RE stage. However, the Department could utilise only ₹ 0.20 crore which comes to 0.45% only. The Department has informed that this amount is meant for regular contribution budget of International Atomic Energy Agency for the year 2018. Remaining amount was proposed for gifting foreign countries blood irradiators, Irradiation and food Irradiation Plant and Bhabhatron Radiotherapy machines. In Central Sector scheme ₹8630.45 cr. were allocated to the Department but it has utilised ₹6083.00 cr. which is only 70.48% of total allocation with two months left. In other Central Sector scheme under Public Sector Undertakings, the Department has been able to utilise only ₹ 1085.00 crore out of total RE allocation of ₹ 1874.00 crore which is only 57.89% of total allocation. The Committee finds that Department will find it difficult to fully utilise the allocation in schemes such as Public Sector undertakings and contribution to IAEA.

**7.12 On the overall analysis, the Committee finds that though expenditure by the Department in Establishment Expenditure and Central Sector Scheme is satisfactory but there is a considerable scope for improvement in the Public Sector Undertakings and Contribution to IAEA scheme because actual utilisation of funds in these schemes is merely 58% and less than 1% only by January, 2018.**

The Committee, therefore, is of the considered view that Department needs to improve its fund utilisation.

7.13 The Committee also recommends that while Department of Atomic Energy should ensure full utilisation of allocated budgetary resources, Ministry of Finance should also adequately accommodate the demands of DAE to obviate adverse effect on activities of the Department in core sectors due to shortage of funds.

## 8. BUDGETARY ALLOCATION IN 2018-19

8.1 The Department has informed that Ministry of Finance has allocated funds based on the following four categories. Details of the four Heads are as under:-

- (1) **Establishment Expenses:** includes pay & allowances and operational expenses of various industrial and research facilities.
- (2) **Schemes:** includes budget for implementation of various ongoing plan projects.
- (3) **Aided Institutes:** Budget includes Grant-in-Aid (GIA) towards salary, non-salary and creation of assets. Only 3% increase over RE has been given which is for GIA towards salary and no additional allocations given for Schemes executed through Aided Institutes.
- (4) **Investments in PSUs:** Budget includes investments in 5 PSUs of the Department - NPCIL, BHAVINI, UCIL, IREL and ECIL.

8.2 The Committee finds that the Department has been allocated ₹ 21518.38 crore in BE 2018-19. The Committee was informed by the Department that for BE-2018-19, the Department of Atomic Energy had projected demand of ₹28, 993.26 crore. However, it has been recommended only ₹21, 518.38 crore which means that the total allocation has been reduced to the tune of ₹7, 474.88 crore. Details of category wise allocation to DAE in BE 2018-19 are tabulated below:

### Category-wise projected demand *vis-a-vis* allocation made to DAE in 2018-19

			(₹ in crore)
Categories	Projected demand	Actual allocation	Reduction by MoF
Establishment Expenditure	16226.12	14220.52	2005.60
Central Sector Scheme	4921.38	3380.56	1540.82
Other Central Sector Scheme:			
(a) Autonomous Bodies	3517.46	2000.00	1517.46
(b) Public Sector Undertaking	4328.30	1917.30	2411.00
<b>Total</b>	<b>28993.26</b>	<b>21518.38</b>	<b>7474.88</b>

### Impact of cut on Projects

8.3 It is evident from the above mentioned table that total allocation to the tune of ₹ 7474.88 crore was reduced at BE 2018-19. The Committee desired to know about the activities of the Department which are

going to get affected due to insufficient allocation of funds. Responding to the query of the Committee, the Department informed that due to insufficient allocation of funds, ongoing activities of the Department under Central Sector Scheme, other Central Sector Scheme, Autonomous Bodies and Public Sector Undertakings will be affected.

8.4 The Committee finds that Establishment expenditure Head includes pay & allowance and operational expenses of various industrial and research facilities. The Department informed that under Establishment expenditure, no additionality has been provided to the department over and above the RE 2017-18 allocation, which may adversely affect the production facilities and as well as R&D Units.

8.5 Central Sector Schemes Head includes budget for implementation of various ongoing plan projects. The department has informed that due to non availability of funds there is no scope to take up any new project in this year. Under Aided Institutions, ongoing projects of Tata Memorial Centre at Varanasi, Punjab, Andhra Pradesh and Guwahati could not be taken up as no additional funds were provided in RE 17-18. However, no additional funds have been allocated under aided institutions in BE 18-19. Under Investment in PSUs Head, reduction will affect the loans payable to Nuclear Power Corporation of India Limited towards Russian credit utilization which is outstanding in the books of Comptroller of Accounts (CAAA).

**8.6 The Committee takes serious note of the financial constraints being faced by the Department since last year and the adverse effect that reduced allocation would have on Industrial, Research & Development activities and important aided institutions such as Tata Memorial Cancer Hospital which are spearheading India's Cancer Research Programme.**

**8.7 Keeping in view, the adverse consequences it will have on the Research & Development and health sectors, the Committee feels that the Department's demand of fund should be adequately accommodated by the Ministry of Finance at RE stage 2018-19.**

9. Now, a brief analysis of some of the important Sectors/Institutions/ Organisations under the Department of Atomic Energy in terms of their main activities, allocation made and utilisation together with their performance is given below:

#### **A. RESEARCH & DEVELOPMENT SECTOR**

9.1 The Research & Development Sector includes research support for nuclear power programme as well as research & development in non-electricity areas. It covers research & development for new power reactor concepts and long term research, radioisotope technology with applications in medicine, agriculture, industry and research; advanced technologies relating to accelerator, laser, computers, materials and others, basic and applied research in frontier areas of science and technology.

9.2 Some of important Research Centres under the Department are :-Raja Ramanna Centre for Advanced Technology (RRCAT) – Indore; Bhabha Atomic Research Centre (BARC) – Mumbai, Indira Gandhi Centre for Atomic Research (IGCAR) – Kalpakkam, Variable Energy Cyclotron Centre (VECC), Kolkata and Atomic Minerals Directorate for Exploration and Research (AMD) – Hyderabad. Overall budgetary allocations and assessment of some research organisations is as under:-

#### **10. RAJA RAMANNA CENTRE FOR ADVANCED TECHNOLOGY (RRCAT) – INDORE**

10.1 Raja Ramanna Centre for Advanced Technology (RRCAT), Indore is a premier unit of the Department of Atomic Energy (DAE), engaged in R&D work in frontline areas of particle accelerators, lasers and their

applications. These R&D activities are supported through indigenous development of related advanced technologies like radio-frequency (RF) power sources, ultrahigh vacuum, cryogenics, control electronics, precision power supplies, superconducting RF cavities etc. In addition, R&D programmes are being pursued in the allied areas of material science especially superconductors and magnetism.

10.2 Some significant achievements of RRCAT in last three years are as under:

- Researchers and students from nearly 100 institutions across the country have used Indus 1&2 facility.
- 1690 user experiments have been carried out during the last three years.
- More than 340 research papers based on work done in Indus facility have been published in the last three years.
- The protein crystallography beamline BL-21 has been used to solve several protein structures.
- The x-ray lithography (BL-7) beamline has been used for development of refractive optics for focusing x-rays and correcting the x-ray wave-fronts; and
- The mercury in the ayurvedic medicine *ras-sindhura* was demonstrated to be benign using x-ray absorption spectroscopy.

### 10.3 *Physical performance*

Apart from Indus some significant achievements of RRCAT in last three years are as under:-

1. The technological development is supported by extensive research in relevant fields like condensed matter physics, accelerator physics and design, laser design, material processing, optics and optical coatings etc. Most of this work is published in well-established international journals including Nature and Scientific Reports. A few of the results are as below:
2. Single crystals and transparent ceramics have been developed for laser host and other applications.
3. Various materials with applications in thermoelectrics, spintronics, sensors etc. have been studied using lab facilities.
4. A hand-held video microscope has been developed for non-invasive imaging of micro-vasculature and blood flow.
5. A clinical study was carried out at Tata Memorial Hospital (TMH), Mumbai on healthy volunteers and patients with oral cancer to evaluate the efficacy at Raman spectroscopy in oral cancer diagnosis.
6. Raman spectroscopy technique has been applied for detection of urea adulteration in packaged milk samples.
7. A laser additive manufacturing system comprising of a 2 kW fiber laser has been used for fabrication of nuclear components not possible to manufacture by conventional methods.
8. Mutation studies have been carried out on crop breeding using electron beam irradiation.

10.4 The Committee desired to know as to what extent, RRCAT has been able to achieve the deliverable, against the 2017-18 outlay outcome budget this year *i.e.* to operation of electron linac at Agricultural Radiation Processing facility in Indore. In response thereto, the Department informed that the 5 kW, 10 MeV electron linac was installed at the Agricultural Radiation Processing Facility (ARPF) in June 2017 after exhaustive endurance and dosimetry tests at RRCAT laboratories. The, Agriculture Radiation Processing Facility is a demonstration facility located near the Devi Ahilya Bai Holkar Fruit and Sabzi Mandi, Indore. AERB clearance for taking up beam operations was received on January 24, 2018. The Linac operations were started after activating the large number of sub-systems and the beam power is being raised gradually with concomitant radiation survey. As on 20th February 2018, linac beam power reached at ARPF. It was informed by the Department that the RRCAT team is confident that the Linac at ARPF will reach the final beam power of 5 kW by 31st March 2018. It was also informed that irradiation experiments were carried out for several users with the electron beam facility. The irradiated samples included several varieties of rice, ground nut and tuberose bulbs, bio-fertiliser samples, medicinal and medical samples, jute fabric and semiconductor.

**10.5 The Committee commends the role of Raja Ramanna Centre of Advanced Technology in development of Indus Cyclotron Facility Radiation Source Facility, hand-held video microscope, Raman Spectroscopy technique for urea adulteration detection in packaged milk samples and laser additive manufacturing system.**

**10.6 The Committee also takes note of the progress made in making electron linac at Agricultural Radiation Processing facility at Indore operational and expects that Agriculture Radiation Processing Facility will be operational by March, 2018. The Committee hopes that the RRCAT will continue to do excellent work for the overall progress and well being of the people of the country.**

#### **10.7 Financial Performance**

The allocation for RRCAT, Indore was ₹ 411.24 cr. at the B.E. 2017-18, which was increased to ₹ 449.74 crore RE 2017-18. The Department could utilise ₹ 350.11 crore till December 2017. The Committee finds that by 31st January, 2018, Centre had utilised 93% of RE expenditure.

10.8 In response to the query of the Committee about the reasons for increase in allocation at RE stage and the manner in which Department proposed to ensure full utilisation of this year's allocation, the Department replied that the allocations for RRCAT were due to implementation of 7th CPC allowances and incremental increase in operational expenses.

**10.9 The Committee while taking note of financial performance of the RRCAT recommends that RRCAT should be allocated adequate resources so that its contribution to socially useful applications and the frontier science experiments can be further scaled up.**

#### **11. BHABHA ATOMIC RESEARCH CENTRE (BARC)**

11.1 BARC is the core Research & Development Organisation of the Department of Atomic Energy. BARC is a premier multidisciplinary nuclear research Centre of India with excellent infrastructure for advanced research & development and expertise covering the entire spectrum of nuclear Science and engineering and related areas. Apart from its headquarters at Trombay spread over 3000 acres, various programmes and facilities of BARC are in operation at Tarapur, Mysore, Kalpakkam, Gauribidanur, Vadodara, New Delhi,

Mount Abu, Gulmarg and Hyderabad. Several Environmental Survey Laboratories and Units are also in operation in different parts of the country. A new campus is being developed at Visakhapatnam.

11.2 The BARC supports a comprehensive programme in basic research and human resource development in the areas of nuclear sciences and technologies. The Centre is engaged in interaction with academic institutions and international cooperation and related advanced areas of research are being strengthened.

11.3 Its organisational structure comprises 20 Groups, 94 Divisions, 4,200 Scientist and Engineers and 15,200 total staff strength. The multidisciplinary and interdisciplinary nature of R&D at BARC calls for a blend of Science, Engineering and Technology related to all aspects of nuclear Science.

#### ***BARC's Contribution towards Urban Waste Management***

11.4 The Department has taken the initiative of solving the problem of management of urban waste through technology. The department informed that a part of the urban waste is biodegradable and while the rest is non-biodegradable. The biodegradable part, which is normally sent to the landfill, contributes a lot towards pollution, which in turn results in common ailments like cough & cold and thereby increases the cities' health management expenditure. Also, there is a major energy expenditure on collecting this waste and carrying it to the landfill across the city.

11.5 During its study visit to Mumbai, the Committee visited the Bhabha Atomic Research Centre on 23rd January, 2018 and held discussions on various aspects of socially useful research being undertaken by them. The Committee Members sought information regarding the BARC and DAE's possible contribution to urban waste management. In response thereto, the Department informed that the main areas where Department of Atomic Energy can contribute towards Swachh Bharat Abhiyan are sludge hygienisation technologies and urban waste management. Department of Atomic Energy has informed that they have envisioned to implement Eco-friendly Nisargruna and sludge hygienisation technologies to 100 smart cities during the next 15 to 20 years towards Swachh Bharat Abhiyan.

11.6 Radiation Hygienisation technology developed by Bhabha Atomic Research Centre employs a simple, economic, effective reproducible and scalable process to deal with the sewage sludge. Radiation sterilisation using gamma radiation from cobalt – 60 source is a well-established industrial process in India and also across other parts of world. Municipal Dry sludge is Hygienised using gamma radiation and its use as organic manure is found satisfactory. First facility of capacity 100 tons/day has been constructed at Ahmedabad & trials have been completed. Facility will be operational by March 2018. Another MoU has been signed with Municipal Corporation, Indore for setting up similar facility.

11.7 The Department has also informed that sludge hygienisation is being identified as one of the significant contributors to the Smart Technology for Smart Cities initiative under the Swachh Bharat Abhiyan.

11.8 The Department has informed that to process the bio-degradable waste, the BARC has developed a technology, namely, NISARGRUNA. NISARGRUNA plant is designed around the basic concept of safe and environment-friendly treatment of biodegradable wastes, combined with generation of energy in the form of biogas. It offers a decentralized alternative for processing the biodegradable waste generated in human settlements. About 150 NISARGRUNA plants are operating across the length and breadth of the country. Basically, it is a biphasic biomethanation plant that can generate about 60-100 m<sup>3</sup> of biogas per tonne of waste processed. The gas can be used either for cooking or for electricity generation. Manure, obtained



after waste processing, is rich in nitrogen and can be used as an excellent soil conditioner. The carbon to nitrogen ratio of this manure is similar to that of fertile land. It has small quantities of phosphorous, potassium, iron and magnesium. Moreover, it is weed-free and does not have any offensive smell.

**11.9 The Committee is glad to note that Bhabha Atomic Research Centre through its NISARGRUNA technology and Sludge Hygienisation Research Initiative (SHRI) is helping in solving the problem of urban waste. The Committee feels that these technologies can prove to be a boon for cities which are grappling with the ever rising problem of municipal waste.**

**11.10 The Committee also notes that the many municipal corporations are keen to take up these technologies. The Committee hopes that more and more Municipal Corporations and State Governments will take advantage of these technologies to make India clean and green. The Committee recommends that to achieve this goal, DAE should also try to popularise these technologies by demonstrating the merits of the technology. In this manner, the Department can contribute to Government of India's flagship initiatives of smart cities and Swachh Bharat Abhiyan as well.**

***BARC's contribution towards health security and agriculture***

11.11 During the study visit to BARC in January, 2018 the Committee desired to know about BARC's contribution to health security and food security, it was informed that the incidence of diseases in seeds and food-borne diseases could be reduced by food irradiation techniques. It could also inhibit post-harvest sprouting in potatoes and onions – disinfect fruits and vegetables, delay ripening in fruits, could eliminate out rightly the food-borne pathogens which could be kept for a long time without refrigeration before substantial consumption. In addition, the irradiation technology could be used for eliminating pest's nuisance, etc.

11.12 Following are technology's developed by Bhabha Atomic Research in the field of Health security and agriculture in 2017-18:

- (i) Litchi Preservation Plant was commissioned and inaugurated on 29th May, 2017 at Muzaffarpur, Bihar. Around 15 tons of Litchi were processed at this facility after inauguration.
- (ii) Trombay Chhattisgarh Dubraj Mutant-1 (TCDM-1) identified for release in Chhattisgarh; BARC KKV-13 for release in Konkan region of Maharashtra.
- (iii) Cowpea TC901 released for summer season on all India basis.
- (iv) Successful demonstration of Trichoderma as bio-fungicide on chickpea field at Raipur.
- (v) Advancement of Trombay mutants for release as new varieties in groundnut, blackgram, rice, soyabean, mustard, linseed and sorghum; and
- (vi) Field demonstration of larvicidal bio-pesticide & sterile insect technique for the control of melon fly, *Bactrocera cucurbitae*.

**11.13 The Committee commends the role played by BARC in food irradiation technology. This technology developed by BARC known as Trombay crop varieties needs to be popularised in the States where they are currently not cultivated. In this context, the Committee appreciates development of new crop varieties of rice, cowpea, groundnut and black gram and commissioning of Litchi Preservation Plant at Muzaffarpur, Bihar in 2017-18. The Committee recommends that the**

**Department should take its technologies to the people through actively engaging with State Governments and other Central Ministries/Departments.**

#### 11.14 *Financial Performance*

The Committee finds that the total Budgetary Allocation for BARC in 2017-18 has been ₹3010.35 crore out of which revenue section allocation is ₹1977.03 cr. and capital section allocation is ₹1033.32 crore. Allocations to BARC were increased at RE 2017-18 to ₹3160.56 crore. In response to the Committee's query about increase in allocation for BARC under Industries Head, it was informed that hike was mainly towards pay and allowances and operational and maintenance expenses of the facility. The Committee finds that out of RE 2017-18 allocation of ₹3160.56 crore, BARC has been able to utilise only ₹2417.69 crore by 31st December 2017 which comes to 76.49% of total allocation. The Committee therefore finds that funds utilisation by BARC is satisfactory. This year, budgetary allocation to BARC is ₹3363.86 crore.

**11.15 The Committee feels that prestigious Centre like BARC devoted to the cause of peaceful nuclear research and capable of making the country proud of its achievements, fully deserves all necessary assistance from the Department. The Committee, therefore, recommends that the Department of Atomic Energy must render all the help to BARC. It also recommends that efforts should be made to grant expeditious sanction for the advanced research facilities so that BARC could be able to excel further in pursuit of its objectives.**

#### B. INDUSTRIES & MINERALS SECTOR

12. The Industrial Sector is providing full support to the front-end as well as back end of the nuclear power programme of the country. The Nuclear Fuel Cycle programme covers industrial activities which are ancillary to the nuclear power sector and comprises design, construction and operation of industrial plants for ore refining, fuel fabrication, heavy water production and others. The programme relating to the industrial applications of nuclear energy in the non-electricity fields addresses applications of radioisotope, laser and accelerator technologies in medicine, food preservation, agriculture, industry and other such areas. The Minerals sector is a starting point of front end of nuclear cycle and provides full support to the nuclear power programme of the country.

#### **INDIAN RARE EARTHS LTD (IREL)**

12.1 IREL, a Mini Ratna (Category-I) Company, is engaged in mining and production of beach sand minerals and rare earth compounds. Some of the minerals produced by IREL find use in the Nuclear Power Programme, while others have wide ranging industrial applications.

12.2 The main minerals separated by IREL from the beach sand at its three units located at Chavara, Kerala; Manavalakurichi, Tamil Nadu and Chatrapur, Odisha are ilmenite, rutile, leucoxene, zircon, monazite, sillimanite and garnet. IREL also produces uranium, thorium and rare earth compounds.

12.3 The installed capacity of IREL mineral products which inter-alia includes ilmenite, rutile, zircon, garnet & sillimanite is about 5.9 lakh tons per annum.

#### 12.4 *Physical Performance*

Following are the main achievements of IREL in 2017-18:-

- (i) To identify Rare Metal & Rare Earth minerals resources through multi-disciplinary survey followed by drilling (2,019m) have been carried out.
- (ii) A total of 2.658t columbite-tantalite (Nb-Ta mineral) and 6.50t xenotime bearing polymetallic concentrate have been recovered during 2017-18 against the target of 4 tonnes each. In addition, 0.550 tonnes beryl has also been recovered as a by-product.
- (iii) To identify beach sand mineral resources through multi-disciplinary surveys (reconnaissance- 379.28 sq km, detailed - 12.402 sq km) followed by drilling have been carried out.

### 12.5 *Financial Performance*

Total Budget for the year 2018-19 for DAE-IREL projects are furnished below:

		(₹ in crore)
Name of the project		BE Allocation 2018-19
1.	Safety against Radio-activity and long term storage of thorium oxalate	1.00
2.	R&D (IRETDC)	1.65
3.	RE Metal & Alloy and permanent magnet	4.00
4.	Rare Earth Theme park	*2.35
Total-DAE-IREL park		9.00

Annual budget allocation for the year 2016-17, 2017-18 and 2018-19 for DAE-IREL projects are as under:

Name of the project	2016-17			2017-18		2018-19
	BE	RE	Amount drawn from DAE	BE	RE	BE
1. Safety against Radio-activity and long term storage of thorium oxalate	1.00	1.00	1.00	2.00	3.00	1.00
2. R&D (IRETDC)	1.00	1.00	0.00	1.00	2.50	1.65
3. RE Metal & Alloy and permanent magnet				0.00	1.00	4.00
4. Rare Earth Theme Park				0.00	1.00	*2.35
Total-DAE-IREL Projects	2.00	2.00	1.00	3.00	9.00	9.00

12.6 The Committee desired to know about reasons behind low IEBR (₹29.60 crore up to January 2018)

generated by Indian Rare Earths Limited against projected figure of ₹ 58.24 crore during the year 2017-18. In response thereto, the Department informed that the estimated CAPEX figure for the year 2018-19 had been scaled down to ₹ 27.9 crore due to non-operation of Manavalakurichi plant of IREL and under-utilisation of Chavara plant due to feedstock shortage.

12.7 The Committee finds that IREL incurred a loss in the financial year 2015-16 since a new chemical plant (*i.e.* MoPP) was put in operation and was unable to achieve the desired level of operation. With all-out efforts both in terms of Revenue Generation and Cost Control, the company could turn around its financial results in 2016-17 and registered a pre tax profit of ₹41.59 crores. During the financial year 2017-18 company hopes to maintain the same level of profits, in spite of the fact that the Manavalakurichi unit remained non-operational during the year 2017-18 due to constraint faced in getting CRZ clearances. IREL expects that it will be able to enhance its capacity and increase its generation of IEBR once the clearance from Ministry of Environment, Forest and Climate Change is obtained for capacity expansion of OSCOM unit and its execution is implemented.

**12.8 The Committee finds that Internal & Extra Budgetary Resources generation (IEBR) by Indian Rare Earths Limited is somewhat fluctuating. The Committee notes the hurdles faced by the IREL at Manavalakurichi Plant and recommends that the Department should proactively take up the issue of Coastal Regulation Zone clearance with Ministry of Environment, Forest and Climate Change and try to sort it out at the earliest. The Committee hopes that with operationalisation of Manavalakurichi Plant in Tamil Nadu, Indian Rare Earths Limited will be able to increase the production of Rare Earth Minerals and increase generation of IEBR also.**

## C. MEGA SCIENCES

### 13. INDIA- BASED NEUTRINO OBSERVATORY PROJECT

13.1 The India-based Neutrino Observatory (INO) Project is a multi-institutional effort aimed at building a world-class underground laboratory with a rock cover of approx.1200 metres for non-accelerator based high energy and nuclear physics research in India. The project is a joint initiative of Department of Atomic Energy and Department of Science & Technology with DAE as lead agency.

13.2 The Department has informed that the initial goal of INO is to study neutrinos. The ICAL detector is designed to address some of the key problems in a unique way. Over the years, this underground facility is expected to develop into a full-fledged underground science laboratory for other studies in physics, biology, geology, hydrology etc. Development of detector technology and its varied applications are an important aspect of the project. The primary goal of the INO is to study the properties of the fundamental particle called “neutrino” which is the most exciting area of research in particle physics after the discovery of Higgs Boson.

13.3 Tata Institute of Fundamental Research (TIFR), Mumbai is the host institute for INO project. All INO related activities will be coordinated through the INO centre, which is to be located at Madurai. This centre will be responsible for the operation and maintenance of the underground laboratory, human resource development and detector R&D. The construction of the underground and surface facilities is expected to be completed in four years and the entire ICAL detector will be completed in the next four years. Preliminary data taking is expected to start in 2020.

13.4 In response to the Committee's query about progress in setting up of INO, the Committee finds that the construction work at this site was halted due to Orders of the Madurai Bench of the Hon'ble Madras High Court. However, minor works have been carried out at the site which includes water tank, 20 km pipeline from Mullaperiyar river and all round fencing.

13.5 It was further added that two Public Interest Litigations (PILs), one in the Madurai bench of the Madras High Court and the other in the National Green Tribunal, South Zone were filed against the INO project. Although the Environmental Clearance (EC) was obtained in 2011, the NGT order put the EC in abeyance and asked for a fresh EC in view of the proximity of the project site at Pottipuram in Theni District of Tamil Nadu to the Matthiketan Shola Park in Kerala. Fresh applications for EC as well as Wildlife Clearances have been submitted online to the Ministry of Environment & Forests and Climate Change (MoEF&CC) on 5th January, 2018.

13.6 As regards the pre-project activities of INO Project, the Department informed that these activities were going on and the Inter-Institutional Centre for High Energy Physics (IICHEP) was functioning from a rented campus in Madurai. The permission for IICHEP building in Madurai is still awaited from Madurai Town Planning Authority. In the meantime, work is going on to produce a prototype detector of appropriate size that will fit in the available space in IICHEP.

13.7 The Committee notes that some local people are apprehensive about the possible adverse impact of India-based Neutrino Observatory (INO) and are protesting against setting up of this project in Theni. Due to these protests and clearances pending with the Ministry of Environment, Forest and Climate Change INO project is getting delayed.

13.8 The Committee feels that public apprehensions on the safety of nuclear installations, mines and projects as also possible fears of adverse impact on their traditional means of livelihood like fishing, biodiversity, health of workers of Uranium mines and those living in the vicinity, environmental impact, etc. are deep seeded. These apprehensions in the minds of the people arise mostly due to lack of communication, ignorance, and rumour mongering. Some amount of fear also comes out of the reported or perceived ill effects of radiation on the people living nearby the nuclear installations and mines which are often exaggerated.

**13.9 In such a grim scenario, the Department needs to allay the apprehensions in the mind of the people against nuclear energy projects through effective campaign. Merely, organizing exhibitions, conducting seminars and producing some video films to cater to only a few lakhs of people would not have the desired impact. If at all, there are some genuine concerns of the people as projected in the media from time to time against INO, Theni or in Jaitapur, Maharashtra or Meghalaya, the Department must proactively dispel those fears by explaining to people in their vernacular languages as to why their apprehensions are unfounded, that these projects are in national interest and that utmost care has been taken to safeguard the interests of the public. The Department also needs to push uranium mining projects so that India's dependence on imported nuclear fuel is reduced.**

**13.10 The Committee, therefore, recommends that to earn the trust of the people, the Department should revisit the whole gamut of strategy and evolve a long term programme for it. The Committee also recommends that to take right message to the public about safety and security of the nuclear energy programmes, the Department should think of constituting Area Standing Committees on public understanding of nuclear technologies consisting of prominent civil society members of the**

area and scientists which should undertake the task to educate the people of the area about the benefits of the project to them and allay their fears. The Committee further recommends these efforts should be initiated around the areas where projects are pending for long due to public protests such as Jaitapur and Pottipuram, Theni.

13.11 The Committee takes note of the hindrances faced and efforts made by the Department in setting up of India-based Neutrino Observatory at Pottipuram, Theni and infrastructure development at Inter Institutional Centre for High Energy Physics, Madurai. The Committee is of the view that the Department should once again try to get environmental clearance from the Ministry of Environment, Forests & Climate Change and convince the local people.

#### D. HEALTH SECTOR

##### 14. TATA MEMORIAL CENTRE (TMC)

14.1 Tata Memorial Centre is an autonomous body under the Department of Atomic Energy. It comprises Tata Memorial Hospital and the Advanced Centre for Treatment, Research & Education in Cancer. The main purpose of the Centre is to render services and carry out research on cancer under its mandate “Service, Research and Education in Cancer”. Diagnosis, treatment and research in Cancer as well as training and education to provide the highest standard of patient care form the core mandate of TMC. Tata Memorial Centre has the responsibility to set standards of therapy for treatment modalities for cancer and a centre to train doctors, scientists and para-medical staff in the field. It has established itself as an internationally well recognised cancer treatment institution and has a number of national and international accolades to its credit.

14.2 Under research facilities, the Translational Research Lab is being set up by TMC. Population Based Cancer Registries are set up in Tarapur, Kaiga, Rawatbhata, Kakrapara, Ratnagiri, Sindhudurg, Chandigarh, Sangrur, Mansa, Kalpakkam, Kudankulam, Visakhapatnam etc. As a part of the community outreach program, extensive cancer awareness and screening camps are conducted in rural India. Cohort study is being carried out in Barshi, Maharashtra. The Advanced Centre for Treatment, Research & Education in Cancer (ACTREC) carries out basic and clinical research. The Clinical Research Centre encompasses novel imaging protocols for cancer diagnosis, molecular Hematopathology and clinical trials driven by pharmacokinetic pharmaco-dynamic data with technology innovations that aim to minimise toxicity and achieve high precision cancer therapy. The research programs in the basic research wing encompass the study of tumor biology and delineation of various pathways involved in cell proliferation, differentiation, apoptosis and metastasis.

14.3 Tata Memorial Centre is a recognized training Centre for cancer education and research by national and international organizations such as Medical Council of India (MCI), World Health Organisation (WHO), International Atomic Energy Agency (IAEA) and Union for International Cancer Control (UICC). Tata Memorial Hospital is a super speciality post-graduate teaching centre and its courses are affiliated to the Homi Bhabha National Institute (HBNI), a Deemed University under Department of Atomic Energy, Government of India, and National Board of Examinations. There are about 500 students undergoing training every year in medical and non-medical nursing and Advanced PG Diploma in technical fields from this centre and Maharashtra State Board of Technical Education, Mumbai Region (MSBTE) in long and short term course. The academic programme in ACTREC continue to attract young talent for PhD programs.

14.4 As regards budgetary allocation to Tata Memorial Centre, it was informed by the Department that budgetary allocations under Tata Memorial Centre has been brought under allocations to Autonomous bodies under rationalised Head from Revised Estimate of 2016-17 onwards in order to utilise the funds to the optimum. During the Demands for Grants meeting the Committee was informed in Budget Estimate 2018-19 there was no provision for the upcoming cancer facilities and Grants-in-aid salaries were being provided by re-appropriation of funds. When the Committee desired to know the reasons therefor, it was replied by the Department that Ministry of Finance had taken action on various aspects of expenditure management including finances of autonomous institutions and have brought a change in accounting of Autonomous Institutions. Now, autonomous bodies have to refund whatever spare balance they used to keep in the past to the Government.

**14.5 While taking note of changes introduced by Ministry of Finance in financial management of Autonomous Institutions, the Committee is of the view that reduction of funds for leading institutions like Tata Memorial Centre, which are doing great work in cancer research, delays the endeavour of these institutions in achieving their main objective of harnessing nuclear research for the benefit of the society. Keeping in view the outstanding service that the Tata Memorial Centre has been doing, the class of competency it has demonstrated in cancer research and upcoming cancer hospitals it is setting up, the Committee strongly recommends that the Tata Memorial Centre should be adequately funded at RE stage allocation 2018-19 to tide over shortage of funds and any kind of reduction in outlay in next year should be avoided.**

## **15. SETTING UP OF NEW CANCER HOSPITALS**

15.1 The Committee desired to know about new Hospitals being set up and upgraded by the TMC under its hub & spoke model for covering the entire length & width of the country. In response to the Committee's query about the status of setting up of Homi Bhabha Cancer Hospital & Research Centre in Visakhapatnam in Andhra Pradesh, the Department informed that this is Establishment of "100 Bedded Cancer Hospital" with a built up area of 38000 Sqm (About 4 lakh sq.ft.) in 77.12 Acres of land at Visakhapatnam. The Sanctioned Amount is ₹ 400.93 Crores. The Department has obtained many statutory approvals this year and project is progressing well.

15.2 As regards construction of Cancer Hospitals in Mohali in Punjab, it has been informed that the 50 acres of land has been allotted by Punjab Government to construct the Homi Bhabha Cancer Hospital & Research Centre at Mullanpur Village, Mohali District, Punjab. The total sanctioned cost of the project is ₹ 480.00 crores. It is proposed to set up a 100-bedded hospital, which will offer a complete range of services to cancer patients. The total area of the project to be constructed in phase I is 43000 Sq. mt. The Project is expected to be completed by the end of year 2018.

**15.3 The Committee notes the progress made in construction of Cancer hospitals in Visakhapatnam, Andhra Pradesh and Mohali, Punjab. The Committee hopes that these Hospitals will be operationalised as per the schedule. The Committee also recommends that adequate budgetary provisions should be made for construction of these Hospitals.**

15.4 During the meeting, the Committee desired to know about progress made up in setting up of Mahamana Madan Mohan Malaviya Cancer Centre, Varanasi. Replying to the query, the Department has informed as there is dire need to create a facility that will serve the poor and affording alike for cancer problem in this

region, the proposal to develop 250 bedded Mahamana Pt. Madan Mohan Malaviya Cancer Centre at Varanasi was approved by PM Office as a “Fast track project”. Accordingly, Banaras Hindu University has earmarked land of 14 acres, free of cost to TMC.

15.5 Regarding progress in construction of the Hospital was informed that CPWD, Varanasi was entrusted the work of residential quarter and boundary wall with gates and with due approval of Department an MOU entered between TMC and CPWD. CPWD floated the e-tender for the subject work. Cost of construction ₹ 40.00 Crores) and after meeting the criteria, the work is awarded to M/s. Studio Next at ₹ 27.50 lakh for architectural consultancy. The stipulated date of completion is January 17, 2019. The boundary wall work executed and approx. 25% of work completed. The excavation work for residential works completed and PCC in progress. Further, the process to get the work done through CPWD, Varanasi for the additional work of Doctors Hostel, Nurses Hostel, Car Parking and Dharmshala has been initiated. ₹650.00 crore has been sanctioned by the Department for construction of the Hospital.

**15.6 The Committee takes note of progress taken place in setting up of Madan Mohan Malaviya Cancer Centre in Varanasi, Uttar Pradesh and hopes that this Centre will be made operational within stipulated time.**

#### **E. POWER SECTOR**

16.1 This Sector deals with the generation of electricity on commercial basis. It covers design, construction and operation of pressurized heavy water reactors, fast breeder reactors and thorium reactors, with associated safety aspects, on commercial scale as well as waste management environment monitoring.

16.2 The Committee finds that share of nuclear energy in the total electricity generation in the country, so far is hovering around 3%, with nuclear generation growing at about the same rate as that of the total electricity generation in the country. In this regard, the Committee desired to know about efforts made by the Department to increase the share of nuclear power in the total electricity generation of the country. In response thereto, the Department has informed that that it has made sincere efforts to increase share of nuclear power by increasing installed power capacity and augmenting fuel supply for existing operating nuclear power plants, both from domestic sources and through imports.

16.3 It was informed by the Department that the Government has accorded administrative approval and financial sanction for 10 indigenous 700 MW PHWRs to be set up in fleet mode. These projects are scheduled to be progressively completed by the year 2031. Pre project activities have also been commenced. Action also initiated for advance procurement of long delivery items mode. These projects will be set up at Chukta-1&2 (2x700 MW), Kaiga-5&6 (2X700 MW), Mahi Banswara- 1&2 (2X700 MW), GHAVP- 3&4 (2X700 MW) and Mahi Banswara- 3&4 (2X700 MW) in fleet mode and two Light Water Reactors (2X1000 MW) in technical co-operation with the Russian Federation. The Government has also accorded “In principle” approval of sites for locating future reactors based both on indigenous technologies and with foreign technical cooperation on their completion- the total installed capacity is expected to reach 22480 MW by the year 2031.

16.4 Following the fruition of international cooperation in civil nuclear energy and conclusion of enabling bilateral intergovernmental agreements, the Government accorded in-principle approval of the following sites for setting up of nuclear power reactors with foreign cooperation:



Location & State	Capacity (MW)	In co-operation with
Kudankulam, Tamil Nadu	4 X 1000 <sup>®</sup>	Russian Federation
Haripur, West Bengal	6 X 1000*	
Jaitapur, Maharashtra	6 X 1650	France
Kovvada, Andhra Pradesh	6 X 1208	USA
Chhaya Mithi Viridi, Gujarat	6 X 1000*	

<sup>®</sup> In addition to KKNPP 1&2      \*Nominal Capacity

The above projects are at various stages of progress.

16.5 The Department informed that currently, seven reactors with a total capacity of 5300 MW are at various stages of construction. The following list provides the details of nuclear reactors under construction:

Location/ State	Project	Capacity (MW)	Status
Kakrapar (Gujarat)	KAPP-3&4	2 x 700	KKNPP 3&4 (2X700 MW) physical progress 82.8% as of January 2018
Rawatbhata (Rajasthan)	RAPP-7&8	2 X 700	RAPP 7&8 (2X700 MW) at Rawatbhata, Rajasthan 68.8%
Kudankulam (Tamil Nadu)	KKNPP– 3&4	2 X 1000	KKNPP 3&4 (2X1000MW) LWRs 1st pour of concrete in June 2017 15.37% physical progress as of January 2018.
Kalpakkam (Tamil Nadu)	PFBR (being implemented by BHAVINI)	500	KKNPP 5&6 (2X1000 MW) LWRs GFA and Credit protocol for its implementation concluded. Work on contracts for delivery of equipment with long manufacturing cycle 1st priority equipment etc, is in progress.

**16.6 The Committee takes note of the future plan of the Department for capacity addition which reveals that ten indigenous reactors in fleet mode and two Light Water reactors with Russian collaboration will be set up in future which will increase India's total installed capacity to 22480 MW by year 2031. In this regard, the Committee is of the view that the Department must expedite the pace of construction of nuclear reactors and accelerate the speed of the average construction time taken. The Committee recommends that the Department should make a firm resolve, mobilise its resources and intensify its efforts to ensure that all proposed nuclear projects are completed and commissioned within the scheduled deadline.**

## 17. NUCLEAR POWER CORPORATION OF INDIA LIMITED

17.1 NPCIL has been set up to develop nuclear power technology and to produce nuclear power as a safe, environmentally benign and economically viable source of electrical energy to meet the increasing electricity

needs of the country. It is presently operating a total of 22 reactors, 18 PHWRs, 2 BWRs and 2 PWRs and is committed towards generating clean energy. The significant achievements of NPCIL during 2017-18 are as under:

- The major activities planned for 2017-18 were related to ongoing projects viz. KAPP 3&4 (2 x 700 MW PHWR), and RAPP 7&8 (2 x 700 MW PHWR), pre-project / launch of sanctioned new projects KKNPP 3&4 (2x1000 MW LWRs) and GHAVP-1&2 (2x700 MW PHWRs), procurement of equipment and components and activities related to EMCCR of KAPS-1&2, pre-project activities for sites at Jaitapur in Maharashtra, Chutka in Madhya Pradesh, Mahi Banswara in Rajasthan, Kovvada in Andhra Pradesh and Mithi Viridi in Gujarat.
- At KAPP-3&4, in KAPP-3, a major milestone of “Concreting of Inner Containment (IC) Dome” was successfully completed and pre-stressing work of Inner Containment (IC) Dome is in progress. Construction of structures of Natural Draft Cooling Towers (NDCT)-3A&3B is completed. Welding of Steam Generator (SG)-Reactor Header-Primary Coolant Pump interconnecting pipe is completed. 400 kV Switchyard and 6.6 kV (Class-III) switchgear are charged. Feeders erection is in progress. In KAPP-4, major milestones like “Calandria tubes rolling”, “Erection of all Steam Generators (SG)” and erection of Calandria Vault top hatch beam are completed. Coolant Channels installation has commenced. Various equipment and components supply and erection works are in progress.
- At RAPP-7&8, civil works are in progress. In RAPP-7 concreting of Inner Containment (IC) wall Ring beam has been completed. Both North and South Steam Generator (SG) vaults are released for SG erection. First Steam Generator (SG) lowered in SG vault and supply of balance SGs is awaited. Feeder erection has commenced and is in progress. In RAPP-8, a major milestone of “Erection of Fuelling Machine (FM) Bridge and Columns” is completed. Calandria- End Shields erection, alignment and welding has been completed. Supply of balance Reactor Headers is awaited. Calandria tube rolling will commence after erection of all Reactor Headers. Hydro testing of Condenser Cooling Water (CCW) inlet line is completed.
- At KKNPP-3&4, work awarded for Main Plant Civil Works and Phase-2 Hydro-Technical Structures (HTS). First Pour of Concrete (FPC) of Reactor Building-3 was done on June 29, 2017, after obtaining consent from AERB for First Pour of Concrete (FPC). Construction of Reactor Building (RB-3) raft is in progress (14 out of 16 pours completed). Construction of Temporary dyke is in progress. Procurement of first priority equipment (Indian scope of supply in Russian designed buildings) is in progress and part supplies have been received at site. Tendering and contracting activities (in NPCIL Scope) in respect of Engineering, Procurement and Construction (EPC) package of Common Services, EPC of Electrical Switchyard package and Diesel Generator (DG) Package are in various stages.
- GHAVP-1&2: Main Plant Engineering Consultancy contract awarded and works are in progress. Tendering activities for Long delivery items like End-Shields, Calandria, Reactor Headers, Steam Generators, Primary Coolant Pump Motor Units, etc are in advanced stage. Excavation clearance is under review by AERB and clearance is expected soon. Various site infrastructure development works are in progress.

- PHWRs in Fleet Mode (10x700 MW PHWRs): Administrative Approval and Financial Sanction from GOI has been obtained for construction of Ten indigenous 700 MW Pressurised Heavy Water Reactors (PHWRs) in Fleet Mode on June 15, 2017. Pre-project activities are in various stages which are prerequisites for launch of these units. Procurement processes for various forgings and long delivery equipments are in progress.
- KKNPP-5&6 (2x1000 MW LWRs): Government accorded Administrative Approval and Financial Sanction for Kudankulam Nuclear Power Project Unit-5&6 on June 15, 2017. Contract for Delivery of Equipment with Long Manufacturing Cycle and First Priority Equipment from Russian Federation, contract for Development of the Working Documentation and contract for First Priority Design Works have been signed between Nuclear Power Corporation of India Ltd. (NPCIL) and Atomstroy export (ASE).
- KAPS-1&2 EMCCR & Upgradation works: Purchase Orders (PO) are already placed for End fitting package, Seal plugs & shield plugs, Feeder pipes, Feeder pipe fittings, venturies & orifices, high pressure Feeder coupling components and Zircoloy components and many of these components are being progressively delivered to site. Various activities at station were taken up & completed in line with stage wise regulatory clearances, and further works are in progress.
- Zircoloy components and many of these components are being progressively delivered to site. Various activities at station were taken up & completed in line with stage wise regulatory clearances, and further works are in progress. Other pre-project activities like land acquisition, R&R, environmental studies, site studies, site infrastructure development, regulatory clearances, etc are in various stages at various new sites.

### ***Financial Performance***

17.2 As regards budget, in 2017-18 financial support to NPCIL in BE 2017-18 under investment head was ₹ 200 crore and loans was ₹170.00 crore which was enhanced to ₹1435.00 crore at RE stage 2017-18. Out of which ₹685.00 crore were under investment Head and remaining ₹ 750.00 crore were allocated under loan Head. Out of total allocation at RE Stage, the Department could utilise only ₹885.00 crore till December, 2017. Investments were utilised fully but loan allocation could not utilised fully, only ₹200 crore were utilised till December, 2017. This year, BE allocation to NPCIL has been ₹1665.00 crore out of which ₹915.00 crore have been allocated under Investment Head and ₹750.00 crore have been allocated under loans.

### ***IEBR Generation by NPCIL***

17.3 In 2017-18, against the projected Internal and Extra Budgetary Resources (IEBR) of Nuclear Power Corporation of India (NPCIL) of ₹ 5825.00 crore, it managed to generate ₹ 7785.00 crore which is ₹1960.00 crore higher than BE 2017-18. The Committee desired to know the reasons for the enhanced IEBR allocation. In response thereto, the Department informed that against the projected Internal and Extra Budgetary Resources (IEBR) of NPCIL of ₹5825 crore, which was with presumption that Budgetary support of ₹2695 Crores (₹173 Crores investment and ₹2522 Crores Russian Credit ) will be given by GoI. However, GoI has sanctioned the budgetary support only of ₹ 1435 Crores in RE 2017-18 and therefore, the balance CAPEX

has to be met from increased IEBR. The projected figure for BE 2018-19 for an amount of ₹5656 crore is a total sum of internal accrual plus borrowings to be made in 2018-19 which is ₹2707 (Internal accrual), R&D Fund of ₹37 crore and borrowings of ₹2912 crore in all totalling ₹5656 crore.

***Budgetary Support to NPCIL in 2018-19***

17.4 The Committee finds that Budgetary support to NPCIL, was increased from ₹ 370.00 crore at BE 2017-18 to ₹ 1435.00 crore at Re 2017-18. The Committee desired to know the reasons behind that, in response thereto, Department informed that Budgetary support was increased in RE 2017-18 to Rs1435.00 crore which is sum of total of Investment ₹685.00 crore and loan ₹750.00 crore. the Department informed that actual requirement in form of budgetary support asked was ₹4305 crore on account of shortfall of earlier years in receipt of equity (₹402.00 crore) as well as Russian Credit (₹ 3903.00 crore) totalling ₹4305.00 crore. Against this equity of ₹685.00 crore and Russian Credit (Loan) of ₹750.00 crore totalling to ₹1435.00 crore only have been provided.

17.5 The Committee also finds that at BE stage allocation 2018-19, budgetary support to NPCIL has been further increased to ₹ 1665.00 crore an increase of ₹ 1295.00 crore over BE 2017-18 allocation. The Committee desired to know the reasons behind increase in budgetary support to the Department at BE 2018-19 in response thereto, it was informed by the Department that as against the demand of equity and loan of ₹3903.00 crore, only ₹1435 crore was given in BE 2018-19 against cumulative demand including previous years short fall, totalling ₹4305.00 crore, out of which ₹1435.00 crore has been provided in RE 2017-18, leaving balance of ₹2870.00 crore in BE 2018-19. The Department explained that in reality, only an amount of ₹1665.00 crore has been provided partly to cover the gap. It was further explained by the Department that 10 new projects had been sanctioned in 2017 and hence the budgetary support requirement had also increased.

17.6 Concerned about the situation during the meeting of the Committee on Demand for Grants, the Chairman asked the Department about the problem of non payment of Russian credit and desired to know the details in manner in which the Department would tide over this situation. In response thereto, the CMD, NPCIL and Secretary, DAE informed the Committee that under a credit arrangement between the Government of Russian Federation and the Government of India, the moment the equipment leave from Russia for Indian projects, that much money is released by the Government of Russian Federation to the suppliers and that becomes a loan on the Government of India. That loan is supposed to be passed on to NPCIL by making a budgetary provision. Then, against that, the same money would be given back to the Government of India so that it became a loan on the NPCIL. Under Investment in PSUs Head, reduction in budgetary allocation will affect the loans payable to Nuclear Power of Corporation of India Limited towards Russian credit utilization which is outstanding in the books of Comptroller of Accounts (CAAA).

**17.7 It is clear that NPCIL was facing shortage of funds therefore; it is not able to make repayment to Comptroller of Aid Accounts and Audit (CAAA), Ministry of Finance. The Committee takes note of reduction in provision for Russian credit to Nuclear Power Corporation of India Limited and adverse impact that reduced allocation will have on Nuclear Power schemes.**

**17.8 In this regard, the Committee is of the view that important programmes such as power generation of NPCIL are the backbone of Nuclear Power programme of India and hence, critical component such as provision towards repayment of Russian credit must not be made to suffer for**

want of funds. The Committee, therefore, recommends that Ministry of Finance should adequately accommodate the demand of the Department of Atomic energy to obviate adverse effects on core activities for want of funds.

#### 18. BHARATIYA NABHIKIYA VIDYUT NIGAM LTD. (BHAVINI)

18.1 As a part of 2nd stage of Indian Power Programme, 500 MWe Prototype Fast Breeder Reactor (PFBR) is being built for the demonstration of commercial scale power production. These reactors produce more fuel than they consume and are essential for expansion and sustenance of Indian nuclear power programme. PFBR will be fore-runner to a series of fast reactors being planned.

18.2 The Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI), a Government of India Enterprise, is a Public Limited Company set up with the objective of constructing and commissioning the first 500 MWe Fast Breeder Reactor (FBR) at Kalpakkam and establish subsequent Fast feeder Reactors in the country.

18.3 The objective of BHAVINI is to plan, execute, and operate an integrated programme of Fast Breeder Technology based Nuclear Power Stations for generating electricity on a commercial basis, commencing with PFBR, symbolising commencement of the second stage of the Nuclear Power Programme.

#### *Physical Performance*

18.4 Informing the Committee about physical progress the Department has informed that all construction activities and total equipment erection & installation have been completed in Prototype Fast Breeder Reactor (PFBR). A number of mandatory pre-requisites tests viz. Integrated Leak Rate Test of Reactor Containment building, commissioning of handling flasks for demonstrating the maintainability of Primary Sodium Pumps, Pressure hold test of Reactor Assembly & Main Vessel, completion of Pre-Service Inspection of 10% tubes of all the Steam Generators and segmental preheating of sodium lines have been completed.

18.5 Presently, work is in progress for commencement of integrated pre-heating, towards which the number of jobs pertaining to reductions of leaks in Reactor Containment Building & Reactor assembly, trial testing of fuel handling systems & reactor protection system devices, augmentation of supports for sodium piping, erection & installation of necessary piping for commencement of nitrogen purging etc. are in progress.

18.6 The Department has informed that commissioning work was in full swing and all efforts were being made to ensure that there were no further slippages owing to any errors in job-scheduling so as to make the PFBR fully functional.

#### *Financial Performance*

18.7 The Committee finds that BHAVINI was allocated ₹50.00 cr. for BE 2017-18 but by January, 2018, but it could not utilise the entire sum allocated to BHAVINI Project. Responding to the query of the Committee about underutilisation of budgetary support, the Department informed that the PFBR project could not get commissioned in 2017 that is why budgetary support could not be utilised and IEBR could also not be generated by BHAVINI.

18.8 However, this year Budgetary support has been increased from ₹50.00 cr. at BE 2017-18 to ₹130.00 cr. at BE 2018-19.

**Budgetary allocation to BHAVINI in 2018-19**

Sl. No.	Description	Amount (in Crore)
1.	PFBR - GoI Loan	100.00
2.	Pre-Project Activities- FBR 1&2	30.00
	<b>Total</b>	<b>130.00</b>

18.9 In response to the Committee's query about likely completion date of PFBR, it was informed that PFBR project was under advanced stage of commissioning. All the construction, equipment erection & installation activities of PFBR have been completed. Subsequent to the completion of integrated preheating of the primary system along with Main Vessel, Sodium filling, purification of sodium and commissioning of both the secondary loops have been completed. However, owing to some hydraulic problems in the secondary loops, resulting in flow oscillation and the repeated failures of Electro Magnetic pumps used for pumping secondary sodium, we have not yet been able to operate the secondary sodium pumps (SSP) at full speed. The time schedules had to be further shifted, at various stages of system commissioning, owing to multiple technical issues/challenges, primarily owing to the fact that most of these pertain to the designs & manufacture, which are first of a kind (FOAK).

18.10 In response to the Committee's query about roadmap drawn for completion of PFBR it was informed that as per the present road-map, it is proposed to (a) fill sodium in the MV and the primary loops (with appropriate clearances & approvals from the regulatory bodies, AERB) and after purification of Sodium and starting of the Primary Sodium Pumps (PSPs), to carry out the necessary isothermal testing of the same, followed by (b) initiation of fuel loading in the core towards approach to first criticality. All efforts are being taken to complete these activities latest by June 2018. The Committee finds that commissioning of PFBR is getting inordinately delayed. The Secretary, DAE while deposing before the Committee in Demands for Grants meeting 2017-18 had assured that reactor would be commissioned by October, 2017. However, the Committee finds that despite promises made by the Secretary to commission the reactor by October, 2017, not even pre-project activities of Fast Breeder Reactor 1&2 could not be started. Now the Committee finds that the Department has again shifted the target of commissioning the project to June, 2018.

**18.11 The Committee is of the view that Prototype Fast Breeder Reactor Technology has an important role to play in ensuring energy security of the country. The Committee opines that if India has to successfully realise the three stage Nuclear Energy Programme and thereby tap huge thorium reserves of the country, the Department has to leave no stone unturned for expediting the commissioning and ramp up the capacity of Prototype Fast Breeder Reactor.**

**18.12 The Committee is constrained to observe that trend of shifting commissioning target of PFBR is not new. As per the original schedule, the project was to be commissioned in September, 2010 which was later rescheduled on several occasions and the new target set in June, 2018. In this context, the Committee would like to reiterate the recommendation made in para no. 24.12 of 299th Report on Demands for Grants 2017-18 of the Department.**

**18.13 The Committee notes that this year also the Department has shifted target of commissioning of PFBR. The Committee, therefore, recommends that Department must make a firm resolve and**

**unflinching commitment to fully utilise the resources allocated to the Department this year and commission the Prototype Fast Breeder Reactor by June, 2018.**

19. **The Committee is of the view that the Department of Atomic Energy through its various Research & Development activities is striving very hard against all odds to uplift the standard of living in the country. The Committee is happy to note that starting from a very modest beginning; the Department has brought the country among elite group of nuclear capable nations harnessing the fruits of nuclear technology. Keeping in view the excellent work that the Department has done, the kind of competence it has exhibited and programmes it has envisaged for the future, the Committee strongly recommends that the Department of Atomic Energy should be adequately funded and any kind of reduction in outlay at RE stage should be avoided.**

## RECOMMENDATIONS/OBSERVATIONS — AT A GLANCE

### MAJOR PROGRAMMES

The Committee notes with satisfaction that in the last sixty four years of its existence, the Department of Atomic Energy has mastered a host of highly complex technologies particularly in the field of R&D, medical radiology, nuclear agriculture, desalination, food irradiation, radio astronomy, supercomputing, particle accelerators, plasma and cryogenics. True to the visions of Dr. Homi J. Bhabha and Jawaharlal Nehru of envisaging the usage of atomic energy to make a difference to the social life of Indians, the DAE should now strive to scale it up and take it to the next level. The Committee feels that the share of nuclear power which is hovering around only three percent of India's total electricity generation, needs to be increased to higher proportions and earnest efforts should be made in that direction. (Para 3.7)

### FINANCIAL PERFORMANCE IN THE LAST THREE YEARS

The Committee observes that on the whole, financial performance of the Department has been satisfactory. The Committee finds that the Department has been able to utilise more than 95% of allocated RE funds, in the years 2015-16 and 2016-17. However, the Committee feels that there is still some scope for improvement. The Committee, therefore, recommends the Department to make a firm resolve and intensify its efforts to ensure that maximum utilisation of resources is ensured. (Para 6.3)

### UTILISATION OF THE APPROVED OUTLAY IN 2017-18

The Committee takes serious note of less disbursement of financial allocation in Industries & Minerals and R&D Sectors against the projected amount and the adverse effect that reduced allocation is having on crucial programmes of the Department such as Industries & Minerals Sector programmes and leading research Institutions like Indira Gandhi Centre for Research & Development and Tata Memorial Cancer Centre. (Para 7.4)

The Committee, therefore, is of the opinion that the well thought out programmes and proposed demands of a crucial Department such as the Department of Atomic Energy should not face drastic cuts in funds allocation. Similarly, reduction of funds to leading R&D units like IGCAR and Cancer hospitals, delays the endeavour of these institutions in achieving their main objective of harnessing atoms for the societal benefit. The Committee recommends that in order to enable the Department to achieve its targets in the field of Nuclear energy, appropriate budgetary allocations should be made keeping in view the fact that Nuclear Energy is a highly capital intensive sector. The Committee also recommends that in future the Ministry of Finance should consider national security and R&D needs while finalising allocation for the Department. (Para 7.5)

On the overall analysis, the Committee finds that though expenditure by the Department in Establishment Expenditure and Central Sector Scheme is satisfactory but there is a considerable scope for improvement in the Public Sector Undertakings and Contribution to IAEA scheme because actual utilisation of funds in these schemes is merely 58% and less than 1% only by January, 2018. The Committee, therefore, is of the considered view that Department needs to improve its fund utilisation. (Para 7.12)



The Committee also recommends that while Department of Atomic Energy should ensure full utilisation of allocated budgetary resources, Ministry of Finance should also adequately accommodate the demands of DAE to obviate adverse effect on activities of the Department in core sectors due to shortage of funds. (Para 7.13)

#### **BUDGETARY ALLOCATION IN 2018-19**

The Committee takes serious note of the financial constraints being faced by the Department since last year and the adverse effect that reduced allocation would have on Industrial, Research & Development activities and important aided institutions such as Tata Memorial Cancer Hospital which are spearheading India's Cancer Research Programme. (Para 8.6)

Keeping in view, the adverse consequences it will have on the Research & Development and health sectors, the Committee feels that the Department's demand of fund should be adequately accommodated by the Ministry of Finance at RE stage 2018-19. (Para 8.7)

#### **RESEARCH & DEVELOPMENT SECTOR**

##### **RAJA RAMANNA CENTRE FOR ADVANCED TECHNOLOGY (RRCAT) – INDORE**

The Committee commends the role of Raja Ramanna Centre of Advanced Technology in development of Indus Cyclotron Facility Radiation Source Facility, hand-held video microscope, Raman Spectroscopy technique for urea adulteration detection in packaged milk samples and laser additive manufacturing system. (Para 10.5)

The Committee also takes note of the progress made in making electron linac at Agricultural Radiation Processing facility at Indore operational and expects that Agriculture Radiation Processing Facility will be operational by March, 2018. The Committee hopes that the RRCAT will continue to do excellent work for the overall progress and well being of the people of the country. (Para 10.6)

The Committee while taking note of financial performance of the RRCAT recommends that RRCAT should be allocated adequate resources so that its contribution to socially useful applications and the frontier science experiments can be further scaled up. (Para 10.9)

##### **BHABHA ATOMIC RESEARCH CENTRE (BARC)**

The Committee is glad to note that Bhabha Atomic Research Centre through its NISARGRUNA technology and Sludge Hygienisation Research Initiative (SHRI) is helping in solving the problem of urban waste. The Committee feels that these technologies can prove to be a boon for cities which are grappling with the ever rising problem of municipal waste. (Para 11.9)

The Committee also notes that the many municipal corporations are keen to take up these technologies. The Committee hopes that more and more Municipal Corporations and State Governments will take advantage of these technologies to make India clean and green. The Committee recommends that to achieve this goal, DAE should also try to popularise these technologies by demonstrating the merits of the technology. In this manner, the Department can contribute to Government of India's flagship initiatives of smart cities and Swachh Bharat Abhiyan as well. (Para 11.10)

The Committee commends the role played by BARC in food irradiation technology. This technology developed by BARC known as Trombay crop varieties needs to be popularised in the States where they are currently not cultivated. In this context, the Committee appreciates development of new crop varieties of rice, cowpea, groundnut and black gram and commissioning of Litchi Preservation Plant at Muzaffarpur, Bihar in 2017-18. The Committee recommends that the Department should take its technologies to the people through actively engaging with State Governments and other Central Ministries/Departments. (Para 11.13)

The Committee feels that prestigious Centre like BARC devoted to the cause of peaceful nuclear research and capable of making the country proud of its achievements, fully deserves all necessary assistance from the Department. The Committee, therefore, recommends that the Department of Atomic Energy must render all the help to BARC. It also recommends that efforts should be made to grant expeditious sanction for the advanced research facilities so that BARC could be able to excel further in pursuit of its objectives. (Para 11.15)

## **INDUSTRIES & MINERALS SECTOR**

### **INDIAN RARE EARTHS LTD (IREL)**

The Committee finds that Internal & Extra Budgetary Resources generation (IEBR) by Indian Rare Earths Limited is somewhat fluctuating. The Committee notes the hurdles faced by the IREL at Manavalakurichi Plant and recommends that the Department should proactively take up the issue of Coastal Regulation Zone clearance with Ministry of Environment, Forest and Climate Change and try to sort it out at the earliest. The Committee hopes that with operationalisation of Manavalakurichi Plant in Tamil Nadu, Indian Rare Earths Limited will be able to increase the production of Rare Earth Minerals and increase generation of IEBR also. (Para 12.8)

### **INDIA-BASED NEUTRINO OBSERVATORY PROJECT**

In such a grim scenario, the Department needs to allay the apprehensions in the mind of the people against nuclear energy projects through effective campaign. Merely, organizing exhibitions, conducting seminars and producing some video films to cater to only a few lakhs of people would not have the desired impact. If at all, there are some genuine concerns of the people as projected in the media from time to time against INO, Theni or in Jaitapur, Maharashtra or Meghalaya, the Department must proactively dispel those fears by explaining to people in their vernacular languages as to why their apprehensions are unfounded, that these projects are in national interest and that utmost care has been taken to safeguard the interests of the public. (Para 13.9)

The Committee, therefore, recommends that to earn the trust of the people, the Department should revisit the whole gamut of strategy and evolve a long term programme for it. The Committee also recommends that to take right message to the public about safety and security of the nuclear energy programmes, the Department should think of constituting Area Standing Committees on public understanding of nuclear technologies consisting of prominent civil society members of the area and scientists which should undertake the task to educate the people of the area about the benefits of the project to them and allay their fears. The Committee further recommends these efforts should be initiated around the areas where projects are pending for long due to public protests such as Jaitapur and Pottipuram, Theni. (Para 13.10)

The Committee takes note of the hindrances faced and efforts made by the Department in setting up of India-based Neutrino Observatory at Pottipuram, Theni and infrastructure development at Inter Institutional Centre for High Energy Physics, Madurai. The Committee is of the view that the Department should once again try to get environmental clearance from the Ministry of Environment, Forests & Climate Change and convince the local people. (Para 13.11)

#### **TATAMEMORIALCENTRE(TMC)**

While taking note of changes introduced by Ministry of Finance in financial management of Autonomous Institutions, the Committee is of the view that reduction of funds for leading institutions like Tata Memorial Centre, which are doing great work in cancer research, delays the endeavour of these institutions in achieving their main objective of harnessing nuclear research for the benefit of the society. Keeping in view the outstanding service that the Tata Memorial Centre has been doing, the class of competency it has demonstrated in cancer research and upcoming cancer hospitals it is setting up, the Committee strongly recommends that the Tata Memorial Centre should be adequately funded at RE stage allocation 2018-19 to tide over shortage of funds and any kind of reduction in outlay in next year should be avoided. (Para 14.5)

#### **SETTINGUPOFNEWCANCERHOSPITALS**

The Committee notes the progress made in construction of Cancer hospitals in Visakhapatnam, Andhra Pradesh and Mohali, Punjab. The Committee hopes that these Hospitals will be operationalised as per the schedule. The Committee also recommends that adequate budgetary provisions should be made for construction of these Hospitals. (Para 15.3)

The Committee takes note of progress taken place in setting up of Madan Mohan Malaviya Cancer Centre in Varanasi, Uttar Pradesh and hopes that this Centre will be made operational within stipulated time. (Para 15.6)

#### **POWERSECTOR**

The Committee takes note of the future plan of the Department for capacity addition which reveals that ten indigenous reactors in fleet mode and two Light Water reactors with Russian collaboration will be set up in future which will increase India's total installed capacity to 22480 MW by year 2031. In this regard, the Committee is of the view that the Department must expedite the pace of construction of nuclear reactors and accelerate the speed of the average construction time taken. The Committee recommends that the Department should make a firm resolve, mobilise its resources and intensify its efforts to ensure that all proposed nuclear projects are completed and commissioned within the scheduled deadline. (Para 16.6)

#### **NUCLEARPOWERCORPORATIONOFINDIALIMITED**

It is clear that NPCIL was facing shortage of funds therefore; it is not able to make repayment to Comptroller of Aid Accounts and Audit (CAAA), Ministry of Finance. The Committee takes note of reduction in provision for Russian credit to Nuclear Power Corporation of India Limited and adverse impact that reduced allocation will have on Nuclear Power schemes. (Para 17.7)

In this regard, the Committee is of the view that important programmes such as power

generation of NPCIL are the backbone of Nuclear Power programme of India and hence, critical component such as provision towards repayment of Russian credit must not be made to suffer for want of funds. The Committee, therefore, recommends that Ministry of Finance should adequately accommodate the demand of the Department of Atomic energy to obviate adverse effects on core activities for want of funds. (Para 17.8)

**BHARATIYA NABHIKIYA VIDYUT NIGAM LTD. (BHAVINI)**

The Committee is of the view that Prototype Fast Breeder Reactor Technology has an important role to play in ensuring energy security of the country. The Committee opines that if India has to successfully realise the three stage Nuclear Energy Programme and thereby tap huge thorium reserves of the country, the Department has to leave no stone unturned for expediting the commissioning and ramp up the capacity of Prototype Fast Breeder Reactor. (Para 18.11)

The Committee is constrained to observe that trend of shifting commissioning target of PFBR is not new. As per the original schedule, the project was to be commissioned in September, 2010 which was later rescheduled on several occasions and the new target set in June, 2018. In this context, the Committee would like to reiterate the recommendation made in para no. 24.12 of 299th Report on Demands for Grants 2017-18 of the Department. (Para 18.12)

The Committee notes that this year also the Department has shifted target of commissioning of PFBR. The Committee, therefore, recommends that Department must make a firm resolve and unflinching commitment to fully utilise the resources allocated to the Department this year and commission the Prototype Fast Breeder Reactor by June, 2018. (Para 18.13)

The Committee is of the view that the Department of Atomic Energy through its various Research & Development activities is striving very hard against all odds to uplift the standard of living in the country. The Committee is happy to note that starting from a very modest beginning; the Department has brought the country among elite group of nuclear capable nations harnessing the fruits of nuclear technology. Keeping in view the excellent work that the Department has done, the kind of competence it has exhibited and programmes it has envisaged for the future, the Committee strongly recommends that the Department of Atomic Energy should be adequately funded and any kind of reduction in outlay at RE stage should be avoided. (Para 19)



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# MINUTES

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VII  
SEVENTH MEETING

The Committee met at 11.00 A.M. on Monday, the 19<sup>th</sup> February, 2018 in Room No. G-074, Ground Floor, Parliament Library Building, New Delhi.

**MEMBERS PRESENT**

1. Shri Anand Sharma — Chairman

**RAJYA SABHA**

2. Shri S.R. Balasubramoniyam
3. Shri C.P. Narayanan
4. Shri Parimal Nathwani
5. Shri Sharad Pawar
6. Shri Bhupender Yadav

**LOK SABHA**

7. Shri E.T. Mohammed Basheer
8. Shri Pankaj Chowdhary
9. Shri P.P. Chauhan
10. Shri Ninong Ering
11. Dr. K. Gopal
12. Shrimati Vasanthi M.
13. Shri Prabhubhai Nagarbhair Vasava
14. Shri Harinarayan Rajbhar
15. Shri Vikram Usendi

**SECRETARIAT**

Shri M.K. Khan, *Joint Secretary*

Shrimati Sunita Sekaran, *Director*

Shri T.N. Pandey, *Director*

Shri Mohd. Salamuddin, *Additional Director*

Shri Rajiv Saxena, *Under Secretary*

**Representatives of Department of Atomic Energy**

1. Dr. Sekhar Basu, Secretary
2. Shri K.N. Vyas, Director, Bhabha Atomic Research Centre
3. Shri Anupam Sharma, Officer on Special Duty
4. Dr. R.A. Badwe, Director, Tata Memorial Centre
5. Shri Kamachi Mudali, Chief Executive, Heavy Water Board
6. Shri S.K. Sharma, CMD, Nuclear Power Corporation of India Ltd.
7. Shri Debasis Das, CMD, Electronics Corporation of India Ltd.
8. Shri C.K. Asnani CMD, Uranium Corporation of India Ltd.



9. Shri D. Singh, CMD, Indian Rare Earths Limited
10. Shri S. Marvin Alexander, Joint Secretary (Administration)
11. Shri M.A. Inbarashu, Joint Secretary (Industries & Minerals)
12. Shri A.R. Sule, Joint Secretary (Research & Development)
13. Shri Arun Srivastava, Member Secretary, Atomic Energy Commission
14. Shri M. Sridharan, Chief Controller of Accounts

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2. At the outset, the Chairman welcomed the Members of the Committee, Secretary, Department of Atomic Energy and his team of officials to the meeting. The Chairman sought to know the views of Secretary on the budgetary allocation for the year 2018-19, projected outlay, budgetary reduction, if any, and its impact on the ongoing/new projected programmes/projects/activities of the department, targets envisaged for the next financial year, target achieved during 2017-18, challenges faced by the department and the corrective measures taken thereon and internal monitoring mechanism etc.

3. Thereafter, the Secretary, Department of Atomic Energy made a Power Point presentation on the major activities and achievements of the Department during the year 2017-18, financial performance of the Department during 2017-18 and the allocations made available during 2018-19. The Secretary also informed that Manavalakurichi Rare Earth project in Tamil Nadu was stuck for want of environmental clearance under Coastal Regulation Zone for last 2-3 years and the same has been done in December, 2017. However, clearance from Ministry of Environment, Forest and Climate Change is yet to be received.

4. The Committee, thereafter, raised queries relating to various issues such as cancer cases in North East, gravitational waves, unavailability of funds to NPCIL for Russian credit, lack of any provision for Grants-in-aid salaries for autonomous bodies and reasons behind it, etc. The Committee desired to have a note on the status and issues of Jaitapur reactor site and India-based Neutrino Observatory at Theni. The Committee also raised queries relating to budgetary allocation to Raja Ramana Centre for Advanced Technology, Nuclear Fuel Complex, amount spent by Uranium Corporation of India Limited and Electronics Corporation of India Limited under Corporate Social Responsibility and progress of construction and operationalisation of cancer hospital in Varanasi etc. The Chairman also desired to know about the proposal to set up mission mode projects towards basic sciences and the efforts of the Department to ensure greater representation of younger scientists in various bodies.

5. The Secretary and other representatives of Department of Atomic Energy, while presenting their views, also responded to some of the queries raised by the Chairman and Members of the Committee. The Chairman also directed the Secretary to furnish written replies to some other queries/points/issues raised by him and the Members of the Committee, which could not be replied during the meeting, to the Secretariat within ten days.

6. The representatives of Department of Atomic Energy, then, withdrew and the Committee adjourned for tea break at 12:40 P.M. \* \* \*.

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- 12. A verbatim record of the proceedings was kept.
- 13. The meeting of the Committee adjourned at 1:43 P.M.

IX  
NINTH MEETING

The Committee met at 3.00 P.M. on Tuesday, the 6<sup>th</sup> March, 2018 in Room No. '63', First Floor, Parliament House, New Delhi.

**MEMBERS PRESENT**

1. Shri Anand Sharma — Chairman

**RAJYA SABHA**

2. Shri S.R. Balasubramoniyam
3. Shrimati Renuka Chowdhury
4. Shri C.P. Narayanan
5. Shri Bhupender Yadav

**LOK SABHA**

6. Shrimati Vasanthi M.
7. Shri Daddan Mishra
8. Shri Shivaji Adhalrao Patil
9. Shri Kirti Vardhan Singh
10. Shri Nagendra Singh
11. Shri Vikram Usendi

**SECRETARIAT**

Shrimati Sunita Sekaran, *Director*

Shri T.N. Pandey, *Director*

Shri S. Rangarajan, *Additional Director*

Shri Mohd. Salamuddin, *Additional Director*

Shri Rajiv Saxena, *Under Secretary*

2. At the outset, the Chairman welcomed the Members to the meeting of the Committee. He informed the Members that the meeting had been convened to consider and adopt the draft 309<sup>th</sup>, 310<sup>th</sup>, 311<sup>th</sup>, 312<sup>th</sup>, 313<sup>th</sup>, 314<sup>th</sup> and 315<sup>th</sup> reports on Demands for Grants 2018-19 of the Departments of Biotechnology, Science & Technology, Scientific & Industrial Research, Space, Ministry of Environment, Forest and Climate Change, Department of Atomic Energy and Ministry of Earth Sciences, respectively.

3. The Committee, after considering the recommendations made in the draft reports, adopted the draft 309<sup>th</sup>, 310<sup>th</sup>, 311<sup>th</sup>, 312<sup>th</sup>, 313<sup>th</sup>, 314<sup>th</sup> and 315<sup>th</sup> reports after some alterations/modifications suggested by the Chairman of the Committee in the 314<sup>th</sup> Report of Department of Atomic Energy. The Committee also decided to present/lay the reports to both the Houses of Parliament on 13<sup>th</sup> March, 2018.

4. The Committee also decided to nominate the Chairman and in his absence Smt. Renuka Chowdhury and in her absence Shri Prasanna Acharya to present the reports in Rajya Sabha and Dr. K. Gopal and in his absence Shri Vikram Usendi to lay the reports on the Table of Lok Sabha on 13<sup>th</sup> March, 2018.

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- 6. \* \* \*
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- 8. The meeting of the Committee adjourned at 3.40 P.M.