

**YEAR 2011**

**Select Questions and Answers**  
**from**  
**the Indian Parliament**  
**on**  
**Nuclear Issues**

Compiled by Nupur Brahma

**Centre for Nuclear & Arms Control**



INSTITUTE FOR DEFENCE  
STUDIES & ANALYSES

1, Development Enclave, Rao Tula Ram Marg, New Delhi-110010

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## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 392**  
TO BE ANSWERED ON 21.12.2011

### SAFETY ACTION PLAN OF IAEA

\*392. SHRI SIVASAMI C.:

SHRI ANANTKUMAR HEGDE:

Will the PRIME MINISTER be pleased to state:

- (a) whether a number of countries have expressed their apprehensions and disapproved the safety action plan of the International Atomic Energy Agency (IAEA) prepared in the wake of Japan's Fukushima accident;
- (b) if so, the details thereof, country wise alongwith the objections raised by each of them and the reaction of the Government thereto;
- (c) whether the Government has apprised the international forum about India's stand in this regard and if so, the details thereof;
- (d) whether the Government has invited or proposes to invite expert teams from IAEA to review the safety and security of nuclear installations and assist the country in the matter; and
- (e) if so, the details thereof and the time by which the said review is likely to be made?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)to(e) A statement is laid on the Table of the House.

STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO. 392 FOR ANSWER ON 21.12.2011 BY SHRI SIVASAMI C. AND SHRI ANANTKUMAR HEGDE REGARDING. SAFETY ACTION PLAN OF IAEA

- (a) & (b) The International Atomic Energy Agency (IAEA) Action Plan on Nuclear Safety prepared in the wake of Fukushima (Japan) accident was adopted by consensus by the Board of Governors which was endorsed at the 55th IAEA General Conference in September 2011.
- (c) India participated in the deliberations at IAEA Board of Governors Meeting in September 2011 and endorsed the recommended action in the draft IAEA Action Plan on Nuclear Safety.
- (d) & (e) A decision has been made to invite IAEA Missions namely, Operational Safety Review Team (OSART) and Integrated Regulatory Review Service (IRRS) for peer review of safety of nuclear power plants, and of the regulatory system, respectively. The Central Government is in touch with IAEA for scheduling the visit of the OSART Team in 2012.

([http://www.dae.nic.in/writereaddata/lssq392\\_211211.pdf](http://www.dae.nic.in/writereaddata/lssq392_211211.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA , STARRED QUESTION NO. 396**  
TO BE ANSWERED ON 21.12.2011

### REQUIREMENT OF URANIUM

\*396. SHRIMATI SUPRIYA SULE:

SHRI ZAFAR ALI NAQVI:

Will the PRIME MINISTER be pleased to state:

- whether the Government has assessed the requirement of uranium during the Twelfth Five Year Plan period;
- if so, the details thereof;
- the quantum of uranium likely to be produced and imported during the said period separately to meet the requirement;
- whether the Government proposes to sign any agreement with Australia for the import of uranium; and
- if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)to(e) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO. 396 FOR ANSWER ON 21.12.2011 BY SHRIMATI SUPRIYA SULE AND SHRI ZAFAR ALI NAQVI REGARDING REQUIREMENT OF URANIUM

- & (b) Yes, Sir. The Country's Uranium requirement in the 12th Five Year Plan period is estimated to be 5057 tonnes. This includes 318 tonnes of low enriched uranium for Tarapur Atomic Power Station (TAPS) -1&2 and Kudankulam (KK) -1&2.
- As a part of long term Uranium procurement agreement entered with Russia and Kazakhstan, the quantum of uranium likely to be imported during the said period is as given below:-

Country	Quantity	Type
M/s TVEL Corporation, Russia	1375 MT	Natural Uranium Di-Oxide Pellets
M/s Kazatomprom, Kazakhstan	1150 MT	Natural Uranium Ore Concentrate

It is not in public interest to disclose details on uranium production in the country.

- & (e) According to reports in media, the leadership in Australia has made statements to reverse the ban on export of uranium from Australia to India. However, no formal communication has been received by the Government of India from Australia, so far. It is not possible, as yet, to provide the time by which Uranium for our reactors will be available from Australia.

([http://www.dae.nic.in/writereaddata/lssq396\\_211211.pdf](http://www.dae.nic.in/writereaddata/lssq396_211211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 398**  
TO BE ANSWERED ON 21.12.2011

### HEAVY AND LIGHT WATER REACTORS

\*398. SHRI NRIPENDRA NATH ROY:

SHRI RAMSINH RATHWA:

Will the PRIME MINISTER be pleased to state:

- (a) the details of the Heavy and Light Water Reactors installed in the various Nuclear Power Plants in the country alongwith the power generated by these reactors, separately during the current five year plan;
- (b) the per unit cost of production of nuclear energy in the country;
- (c) whether nuclear energy is costlier in the country than that in other developing countries; and
- (d) if so, the details thereof and the steps taken/proposed to be taken by the Government to bring down the cost of nuclear energy?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)to(d) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO.  
398 FOR ANSWER ON 21.12.2011 BY SHRI NRIPENDRA NATH ROY SHRI RAMSINH  
RATHWA REGARDING HEAVY AND LIGHT WATER REACTORS

(a) The present installed nuclear power capacity of 4780 MW in the country comprises of two Light Water Reactors (LWRs) with a capacity of 320 MW and eighteen Pressurised Heavy Water Reactors (PHWRs) with a capacity of 4460 MW. The generation from LWRs and PHWRs during the current five year plan upto November 2011 has been 11569 Million Units and 86918 Million Units, respectively.

(b) The average tariff of nuclear power in the year 2010-11 was 2.49 per unit.

(c) No, Sir.

(d) Does not arise.

([http://www.dae.nic.in/writereaddata/lssq398\\_211211.pdf](http://www.dae.nic.in/writereaddata/lssq398_211211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.4401**  
TO BE ANSWERED ON 21.12.2011

### TATA MEMORIAL CENTRE

4401. SHRI NARAHARI MAHATO:

SHRI NRIPENDRA NATH ROY:

Will the PRIME MINISTER be pleased to state:

- (a) the details of the scheme for sharing of hospital income in Tata Memorial Centre;
- (b) the objectives behind the scheme; and
- (c) the total amount shared with doctors under the scheme during the last three years and the current year?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- a) The Sharing of Hospital Income (SHI) Scheme is in operation in Tata Memorial Centre(TMC) since 1948. Based on the principle of high volume services for lower strata patients with quality treatment, 60% of the patients in TMC are treated either totally free or with 80 to 90% subsidy. The amount generated from clinical services to private patients (which is only 40% of the total patient load) is shared. The sharing of the income is restricted to senior medical faculty with graded payment based on seniority. The scheme of payment of Non Practicing Allowance (NPA) which is paid to the medical doctors in Government Hospitals, was introduced in TMC in 1965 and if a doctor opts for SHI he will not be entitled for NPA, with consequent reduction in pensionary benefits.
- b) The objective of the Scheme is to retain top level expert medical faculty, which is very much in short supply especially in oncology; to fully utilize the scarce resource of trained medical faculty; making available the best talented medical personnel to fight the challenges of cancer and to provide their services to patients in TMC; to extend the best possible advanced medical education and hands on training to PG students and various organizations and to excel in research output.
- c) The total amount shared during the last three years is:

2008-09 .6.27 crore

2009-10 .6.33 crore

2010-11 .6.80 crore

Current year .5.50 crore

95 doctors are eligible for SHI and the average amount received per month by each of these doctors works out to be about 60,000/-

(<http://www.dae.nic.in/writereaddata/4401-lsus211211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.4428**  
TO BE ANSWERED ON 21.12.2011

### KUDANKULAM NUCLEAR POWER PLANT

4428. SHRI SHRIPAD YESSO NAIK:

Will the PRIME MINISTER be pleased to state:

- the initial estimated cost and schedule fixed for the Kudankulam Nuclear Project;
- the details of the time and cost overruns of various atomic power plants under construction including Kudankulam nuclear power plant;
- whether the Government has received assistance/loan from any of the foreign countries for the Kudankulam power plant; and
- if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- The approved cost of Kudankulam Nuclear Power Project, Units 1&2 (KKNPP 1&2 - 2 x 1000 MW) was 13,171 crore and were scheduled to be completed by December 2007 and December 2008, respectively.
- Four nuclear power projects are presently under construction viz. KKNPP Units 1&2 at Kudankulam in Tamilnadu; Kakrapar Atomic Power Project (KAPP) Units 3&4 (2x700 MW) at Kakrapar in Gujarat; Rajasthan Atomic Power Plant (RAPP) Units 7&8 (2x700 MW) at Rawatbhata in Rajasthan and Prototype Fast Breeder Reactor (PFBR-500 MW) at Kalpakkam in Tamilnadu.

Currently, no time/cost overrun is expected in respect of KAPP Units 3&4 and RAPP Units 7&8 projects. The construction of KKNPP, set up in technical cooperation with Russian Federation, was commenced in March 2002. The project has been delayed due to non-sequential deliveries of equipments from the Russian Federation. Though the project reached advanced stage of completion with commissioning scheduled in 2011-12, the start up of the project has been delayed. The project is now expected to be completed early in the 12th Five Year Plan at an estimated revised cost of 15,824 crore. The PFBR was scheduled to be completed in March 2011 with an approved cost 3,492 crore. Being first of its kind in the country, development of complex and advanced technologies, development of special materials & procedures and equipment of exacting standards took more time resulting in delay of its completion. The project is now expected to commence power operations in March 2015. The estimated revised completion cost of the project is 5,677 crore.

(c) Yes, Sir.

(d) The Russian Federation has extended a state credit of .6,416 crore for KKNPP Units 1&2.

(<http://www.dae.nic.in/writereaddata/4428-lsus211211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.4506**  
TO BE ANSWERED ON 21.12.2011

### REVIEW OF RADIATION INCIDENT

4506. SHRI PRADEEP MAJHI:

SHRI KISHANBHAI V. PATEL:

Will the PRIME MINISTER be pleased to state:

- (a) whether the action taken by the Government following the radiation incident in Mayapuri in Delhi in 2010 has been reviewed; and
- (b) if so, the details and the outcome thereof?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) Yes, Sir.
- (b) After the Mayapuri (NCT of Delhi) incident in April 2010, Atomic Energy Regulatory Board (AERB) and other Government departments/agencies concerned initiated several actions to prevent recurrence of such an incident. These actions include strengthening of registry of radioactive sources, enhanced inspections, strengthening of regulatory capabilities, radiation checks on incoming metal scrap and installing radiation detection equipment at borders. These actions were reviewed in the Central Government by the Committee of Secretaries chaired by Cabinet Secretary.

(<http://www.dae.nic.in/writereaddata/4506-lsus211211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.4548**  
TO BE ANSWERED ON 21.12.2011

### NUCLEAR POWER EDUCATION INSTITUTE

4548. SHRI G.M. SIDDESHWARA:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government proposes to set up Nuclear Power Education Institute to train the scientists and others in the field of nuclear power generation; and  
(b) if so, the details thereof alongwith the locations identified for the purpose?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a)&(b) Homi Bhabha National Institute (HBNI) having the status of a deemed to be university under the UGC Act has already been set up. Academic programs of the following ten constituent institutions of Department of Atomic Energy (DAE) come under the ambit of HBNI :

- 1) Bhabha Atomic Research Centre
- 2) Indira Gandhi Centre for Atomic Research
- 3) Raja Ramanna Centre for Advanced Technology
- 4) Variable Energy Cyclotron Centre
- 5) Tata Memorial Centre
- 6) Institute for Plasma Research
- 7) Institute of Physics
- 8) Institute of Mathematical Sciences
- 9) Harish Chandra Research Institute
- 10) Saha Institute of Nuclear Physics

Headquarters of HBNI are in Mumbai. Objectives of HBNI are :

- i) To encourage pursuit of excellence in sciences (including engineering sciences) and mathematics in a manner that has major significance for the progress of indigenous nuclear technological capability.
- ii) To provide an academic framework for integrating basic research being done at the grant-in-aid institutions and the research centres of DAE with technology development at the research centres. The institutions of DAE participating in the programmes of HBNI will be its Constituent Institutions.
- iii) To encourage inter-disciplinary research carried out within an institution or inter-institutionally, which has been the hall mark of the research & development programmes of the Constituent Institutions.
- iv) To nurture an environment for attracting high quality manpower in sciences including engineering sciences for taking up a career in nuclear science and technology and related areas in the Department of Atomic Energy or elsewhere. The institute also provides a framework for enabling the employees of the DAE for sharpening and updating their knowledge base while in service.

(<http://www.dae.nic.in/writereaddata/4548-lsus211211.pdf>)



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.4550**  
TO BE ANSWERED ON 21.12.2011

### CENTRE FOR RADIO ECOLOGY

4550. SHRI RAMSINH RATHWA:

Will the PRIME MINISTER be pleased to state:

- (a) whether the work of the Centre for Radio Ecology is progressing as per schedule;
- (b) if so, the details thereof;
- (c) if not, the reasons therefor and the time by which the said Centre is likely to be made operational; and
- (d) the details of the funds allocated and expenditure incurred so far in setting up of the said Centre?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) The work of Centre for Radio Ecology being established at Guru Jhambeshwar University of Science & Technology (GJUST) at Hisar, Haryana is progressing as per schedule. The Centre has already started carrying out the environmental sampling for water, soil, air and grains/cereals/vegetables/fruits/fodder as per the schedule.
- (c) Does not arise, in view of reply to (a) & (b) above.
- (d) Funds to the extent of ` 3.93 crore is allocated and an expenditure of `2.106 crore has been incurred, so far.

(<http://www.dae.nic.in/writereaddata/4550-lsus211211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO : 332**  
TO BE ANSWERED ON 15.12.2011

### COMMISSIONING OF KUDANKULAM NUCLEAR POWER PROJECT

\*332. SHRI A. ELAVARASAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether troubled by protests and blockades, the Nuclear Power Corporation of India has decided to postpone commissioning of the first 1000 mw unit of Kudankulam Nuclear Power Project;
- (b) if so, the details thereof;
- (c) whether the engineers are still assessing the working of the systems after crucial hot run of the plant;
- (d) if so, the details thereof;
- (e) whether any new deadline has been fixed for commissioning the Unit-I and II; and
- (f) If so, the details thereof?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) to (f) A statement is laid on the Table of the House

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION  
NO.332 FOR ANSWER ON 15.12.11 BY SHRI A. ELAVARASAN REGARDING  
COMMISSIONING OF KUDANKULAM NUCLEAR POWER PROJECT

- (a)&(b) The agitation against the Kudankulam project by a section of the local people started about three months ago due to apprehensions of the safety following the Fukushima (Japan) incident and campaign spread by groups ideologically opposed to nuclear power. The agitation has hampered work on the project, which has resulted in delay in commissioning the units at Kudankulam.
- (c)&(d) Kudankulam Nuclear Power Plants (KKNPP), Units 1&2 are at advanced stage of commissioning. The 'hot run' has been completed in Unit 1 in July 2011. Several reactor and auxiliary systems have been made functional. The unit is made ready for fuel loading. At present, maintenance work is being undertaken at the plant.
- (e)&(f) The plan was to start generation from the plant in the current financial year. The agitation has affected the attendance of employees and the contractors workers. On normalization of the situation, the mobilization of workers will take time and will have effect on regaining the momentum. The further works include fuel loading, approach to criticality, mandatory tests and synchronization to the grid in the units 1&2, including obtaining necessary clearances at different stages from Atomic Energy regulatory Board.

([http://www.dae.nic.in/writereaddata/rssq332\\_151211.pdf](http://www.dae.nic.in/writereaddata/rssq332_151211.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2481**  
TO BE ANSWERED ON 15.12.2011

### **NEW NUCLEAR POWER PROJECT IN RAJASTHAN**

2481. DR. PRABHA THAKUR:

SHRI ASHK ALI TAK:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that the site selection committee of Nuclear Power Corporation has identified a place for establishing a new nuclear energy power project near Mahi Bajaj Sagar Dam in Banswada in Rajasthan; and
- (b) if so, the time by which Central Government proposes to give its approval to this project?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)&(b) The Site Selection Committee appointed by the Central Government has evaluated the site at Mahi-Banswara in Rajasthan in accordance to the criteria laid down in Atomic Energy Regulatory Board (AERB) siting code and found it to be suitable. The Government has accorded 'in principle' approval of the site for locating 4x700 MW nuclear power plants. The plan is to set up the project in two phases of 2x700 MW each. Currently, pre-project activities have been initiated at the site. These include land acquisition, obtaining statutory clearances, site investigations and preparation of detailed project report. The project financial sanction of the first phase is expected in the XII Five Year plan.

([http://www.dae.nic.in/writereaddata/rsus2481\\_151211.pdf](http://www.dae.nic.in/writereaddata/rsus2481_151211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2482**  
TO BE ANSWERED ON 15.12.2011

### REACTORS PURCHASED FROM RUSSIA

2482. DR. RAM PRAKASH:

Will the PRIME MINISTER be pleased to state:

- (a) whether India has purchased two VVER (Vodo Vodyanoi Energetichesky Reactors) of one thousand megawatt each for installing them in Kudankulam, Tamil Nadu;
- (b) if so, the time when these reactors were purchased and their price; and
- (c) whether the technology used in the reactors is in accordance with the security norms of the western countries?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) Two VVERs each of 1000 MW capacity, are being set up at Kudankulam in Tamil Nadu in technical cooperation with Russian Federation.
- (b) While the design and supply of major equipment are in the Russian scope, construction, commissioning and some of the supplies are in Indian scope. The final agreement in this regard was signed on July 24,2001.
- (c) Any reactors to be set up in the country with foreign technical cooperation should meet the safety norms prescribed by the regulatory authorities in the country of origin and the Atomic Energy Regulatory Board (AERB) in India. The VVERs meet both the Russian and Indian regulatory requirements on safety. VVERs being set up at Kudankulam also meet IAEA safety requirements.

([http://www.dae.nic.in/writereaddata/rsus2482\\_151211.pdf](http://www.dae.nic.in/writereaddata/rsus2482_151211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2483**  
TO BE ANSWERED ON 15.12.2011

### LIFTING BAN OF URANIUM SALE TO INDIA BY AUSTRALIAN GOVERNMENT

2483. SHRI R.C. SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that Australian Government has lifted its ban on selling uranium to India for use in nuclear power plants;
- (b) if so, the details thereof;
- (c) whether Government could ensure the consistent supply of uranium from Australia; and
- (d) if so, the details thereof?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)to(d) According to reports in media, the leadership in Australia has made statements to reverse the ban on export of Uranium from Australia to India. However, no formal communication has been received from Australia, so far. There are press reports that Australia is considering supply of Uranium to India. It is not possible, as yet, to provide the time by which Uranium for our reactors will be available from Australia.

([http://www.dae.nic.in/writereaddata/rsus2483\\_151211.pdf](http://www.dae.nic.in/writereaddata/rsus2483_151211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2484**  
TO BE ANSWERED ON 15.12.2011

### GOVERNMENT'S ASSESSMENT OF KUDANKULAM NUCLEAR PLANT

2484. SHRI PIYUSH GOYAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether senior retired bureaucrats and other Government officials have written against the go-ahead of the Kudankulam nuclear plant;
- (b) if so, the details thereof;
- (c) whether Government has conducted an assessment of the impact of the nuclear plant;
- (d) if so, the details thereof; and
- (e) if not, the reasons therefor?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)&(b) Some senior retired bureaucrats and other government officials have raised issues related to nuclear power safety, independence of regulatory body, review of statutes like civil liability for nuclear damage act and asked for a hold on setting up new nuclear power projects and not specifically about Kudankulam.
  - (c)&(d) Yes, Sir. A rapid Environmental Impact Assessment (EIA) of the Kudankulam Nuclear Power Project (KKNPP-1&2) was carried out in 2001 and a more detailed EIA in 2003. Later, a comprehensive EIA of the site for six units was carried out as a part of KKNPP-3 to 6 environmental clearance processes.
  - (e) Does not arise.
- ([http://www.dae.nic.in/writereaddata/rsus2484\\_151211.pdf](http://www.dae.nic.in/writereaddata/rsus2484_151211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2485**  
TO BE ANSWERED ON 15.12.2011

### LIABILITIES OF SUPPLIES AS PER NUCLEAR DAMAGE RULES, 2011

2485. SHRI P. RAJEEVE:

Will the PRIME MINISTER be pleased to state:

- (a) the liabilities of the supplier as per the Civil Liability for Nuclear Damage Rules, 2011;
- (b) whether it is a fact that as per the above mentioned rules, the nuclear operator's right to recourse has been restricted to either the period of granting of initial license or the product liability period;
- (c) whether operators have to secure an initial license before construction of a Nuclear Power Project (NPP) can begin; and
- (d) the average time it has taken in the past for construction of NPPs in India?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)&(b) The liability of the supplier of nuclear equipment or material or services will be as per section 17 of the Civil Liability for Nuclear Damage Act, 2010 read with Rule 24 of the Civil Liability for Nuclear Damage Rules, 2011. A copy of the said rules is laid on the table of the Houses. The operator's right of recourse to the supplier will be as per the contract entered between operator and supplier. Rule 24 defines the minimum period of such a contract to the initial licensing period or the product liability period, whichever is longer.
- (c) The project proponent/operator has to obtain statutory clearances viz., environmental clearance, Coastal Regulation Zone clearance (in respect of coastal sites) from Ministry of Environment and Forests (MoEF), consent to establish from State Pollution Control Board before commencing construction of nuclear power plants. Consent has also to be obtained from Atomic Energy Regulatory Board (AERB) before construction. AERB gives consent at various stages of the NPP namely siting, construction, commissioning and operation.
- (d) The average time taken for the construction of nuclear power plants in case of the last three projects completed has been about five and half years.

([http://www.dae.nic.in/writereaddata/rsus2485\\_151211.pdf](http://www.dae.nic.in/writereaddata/rsus2485_151211.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2486**  
TO BE ANSWERED ON 15.12.2011

### CIVIL USE OF ATOMIC ENERGY

2486. SHRI TARUN VIJAY:

Will the PRIME MINISTER be pleased to state:

- the areas where civil use of Atomic Energy is being done;
- the details of the projects of this nature and cost of each such project; and
- the status of India-Japan Cooperation in civil nuclear energy region?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- In addition to generation of electrical power (present Installed capacity being 4780 Mwe) through nuclear fission, the radiation and radioisotope technologies have been successfully and extensively deployed as non-power applications for societal benefit in Agriculture, Healthcare and Industry. These applications have made considerable impact in terms of (a) availability of improved varieties of crop plants (especially, oil seeds and pulses), (b) improving microbiological safety of food and enhancement of shelf-life of certain vegetables and fruit, their export and (c) diagnosis of and treatment of several health conditions, particularly, cancer and (d) industrial radiography. In addition, the radiation and isotope technologies are also used for material modification, quality control of manufactured components, industrial trouble shooting and process optimization, augmenting water resources in arid and dry regions etc.
- The major non-power applications of isotope & radiation technology are carried out through Board of Radiation & Isotope Technology (BRIT) in the areas of Health Care, Industrial Applications and also Research & Development. The XI Plan projects being implemented by BRIT (alongwith their costs) are as follows:

S.No.	Name of the Project	Sanctioned Cost (` in crores)
1.	Integrated Facility for Radiation Technology (IFRT), X Plan	18.05
2.	Revamping and Augmentation of Infrastructural	15.92
3.	DAE Medical Cyclotron Processing Facility for Radio-Isotopes & Radiopharmaceuticals	25.15
4.	Integrated Irradiator Development	3.00
5.	Production facility for <sup>99</sup> Mo- <sup>99m</sup> Tc Column Generators of high specific activity Mo-99	7.50
6.	Construction of state of the art immunoassay Facility	2.05
7.	Construction of state of the art GLP & GMP Compliant labelled compounds laboratory (CCLC)	3.40
8.	Indigenous HDR Brachytherapy Equipment (IHDR)	9.60
9.	Medical Grade Fission Moly production capacity	128.00



## **Nuclear and Arms Control Centre**

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Some of the XI plan projects of BARC (along with their costs) in the field of Agriculture, Food preservation and Healthcare and Radiation Biology, industries for civil use of nuclear energy are listed below as examples:

1. Isotope processing at BARC (Rs.0.6 Cr)
2. Isotopes and radiation technologies (Rs.65.25 Cr)
3. Research on Agricultural Products (Rs.75.0 Cr)
4. R&D in Radiation Technology for Food Preservation and Hygienization (Rs.8.25 Cr)
5. Radiation Medicine, Radiation Effects and Healthcare (Rs.5.60 Cr)
6. Nuclear Diagnostics (VECC, Kolkata) (Rs.2.0 Cr)
7. Setting up 30 meV Medical Cyclotron (VECC, Kolkata) (Rs.57.54 Cr)
8. Augmentation of Healthcare Services (Rs.74.0 Cr)
9. Nuclear Diagnostics and medical use of PET (VECC, Kolkata) (Rs.15.0 Cr).
10. Development of cancer care facility at Shillong (Rs.50.0 Cr)
11. Advance Research in Molecular Biology and study of radiation effects on human health (Rs.10.0 Cr)
12. Radiation Effects in Biological systems (Rs.37.80 Cr)
13. Technology and Infrastructure Development (Cancer) (Rs.19.50 Cr)
14. Cancer and Public health research- Rs.36.50 Cr

- c) Three rounds of negotiations have been held so far. Discussions are continuing on a draft Nuclear Cooperation with Japan.

([http://www.dae.nic.in/writereaddata/rsus2486\\_151211.pdf](http://www.dae.nic.in/writereaddata/rsus2486_151211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 285**  
TO BE ANSWERED ON 14.12.2011

### SAFETY NORMS FOR NUCLEAR POWER PLANTS

\*285. DR. THOKCHOM MEINYA:

SHRI J.M. AARON RASHID:

Will the PRIME MINISTER be pleased to state:

- (a) whether the International Atomic Energy Agency (IAEA) has specified the safety norms to be followed by all the nuclear plants in the world;
- (b) if so, the details thereof;
- (c) whether the Indian nuclear plants/ installations follow the same safety standards/norms as being followed by the nuclear plants of the developed world;
- (d) if so, the details thereof and if not, the reasons therefor;
- (e) whether the Government has set up an independent expert body to periodically inspect and evaluate safety standards of nuclear installations across the country; and
- (f) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) to (f) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO. 285 FOR ANSWER ON 14.12.2011 BY DR. THOKCHOM MEINYA AND SHRI J.M. AARON RASHID REGARDING SAFETY NORMS FOR NUCLEAR POWER PLANTS.

- (a) & (b) Yes, Sir. IAEA has published a number of documents/guidelines on various safety aspects related to nuclear plants. These are recommendatory in nature.
- (c) & (d) The Indian Nuclear Plants follow the standards developed by the Atomic Energy Regulatory Board (AERB). While developing standards, the safety documents and guidelines of AERB, corresponding documents of IAEA are considered. Indian safety standards / norms are stringent and compare favourably with those followed by nuclear plants in the developed world.
- (e) & (f) AERB, an independent organisation periodically inspects and evaluates safety standard of nuclear installations across the country. The Central Government has introduced the Nuclear Safety Regulatory Authority Bill, 2011, to accord statutory status to the regulatory body. The details of the Bill are in the public domain.

([http://www.dae.nic.in/writereaddata/lssq285\\_141211.pdf](http://www.dae.nic.in/writereaddata/lssq285_141211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 299**  
TO BE ANSWERED ON 14.12.2011

### FUEL FOR ATOMIC PLANTS

\*299. SHRI LAL CHAND KATARIA:

DR. MAHESH JOSHI:

Will the PRIME MINISTER be pleased to state:

- (a) whether the shortage of fuel for atomic plants is affecting the nuclear power programme in the country;
- (b) if so, the details thereof and the reasons therefor;
- (c) the expenditure incurred on import of uranium during the last three years and the current year, country-wise and year-wise;
- (d) whether the Government proposes to make the country self-reliant with respect to atomic fuel;
- (e) if so, the details thereof alongwith the steps taken by the Government in this regard;
- (f) whether the Government of Australia has eased the norms for supply of uranium to India;
- (g) if so, the details thereof; and
- (h) the steps taken/proposed to be taken to ensure regular/proper supply of uranium from various countries, including Australia?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) to (h) A statement is laid on the Table of the House.

STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO. 299 FOR ANSWER ON 14.12.2011 BY SHRI LAL CHAND KATARIA AND DR. MAHESH JOSHI REGARDING FUEL FOR ATOMIC PLANTS.

- (a) & (b) The present installed capacity in the country is 4780 MW comprising twenty nuclear power reactors. Of these, ten reactors with a capacity of 2840 MW comprising KGS 1 to 4 (4 x 220 MW), NAPS 1&2 (2 x 220 MW), MAPS 1&2 (2 x 220 MW) and TAPS 3&4 (2 x 540 MW) are fuelled by indigenous fuel, which is not available in the required quantity. These are accordingly being operated at lower power levels matching the fuel supply.

The remaining ten nuclear power reactors with a capacity of 1940 MW are under International Atomic Energy Agency (IAEA) safeguards in accordance with the separation plan. Of these, presently, one reactor (RAPS-1 100 MW) is under long shut down for techno-economic assessment on continuation of operation. The remaining nine reactors under (IAEA) safeguards use imported fuel, which is available in required quantity. These reactors are operating at rated capacity.

- (c) The details of expenditure incurred on import of uranium are as given below:

## Nuclear and Arms Control Centre

Country	Year			
	2008-09	2009-10	2010-11	2011-12
<b>France</b>	120.54	145.54	0	0
<b>Russia</b>	57.92	273.78	312.50	111.84
<b>Kazakhstan</b>	0	0	379.84	0

(d) Yes, Sir.

(e) The Uranium Corporation of India Ltd. (UCIL), a Public Sector Undertaking under the aegis of Department of Atomic Energy is presently operating five underground mines viz. Jaduguda, Bhatin, Narwapahar, Turamdih and Bagjata. One opencast mine at Banduhurang and two processing plants at Jaduguda and Turamdih, East Singhbhum Kharswan District, Jarkhand State. Also an underground mine and process plant is under constructions at Tummalapalle, Andhara Pradesh. The Lambapur Uranium Project, Nalgonda District, Andhra Pradesh is under the pre-project activities. An underground mine and process plant at Gogi, Karnataka is under pre-project stage. Development of uranium resources at Kyelleng Pydengsohiong Mawathabah (KPM), Meghalaya is also under consideration. Development of Uranium resources available at Rohil, Rajasthan is under exploration by AMD. In Tummalapalle, the UCIL has undertaken the construction of an underground mine and plant of 3000 tonnes per day (tpd) ore capacity which is expected to be commissioned in the year 2012. The pre-project activities for augmenting the production and processing capacity to 4500 tpd ore are in progress and expected to be commissioned in the year 2015. Further plans have been envisaged to construct a mine and a plant of 6000 tpd ore capacity (in stages) after successful commissioning of the ongoing project.

(f) According to reports in media, the leadership in Australia has made statements to reverse the ban on export of uranium from Australia to India. However, no formal communication has been received from the Government of Australia so far. There are press reports that Australia is considering supply of Uranium to India. It is not possible, as yet, to provide the time by which Uranium for our reactors will be available from Australia.

(g) Does not arise in view of reply to (f) above.

(h) Contracts have been signed with France, Russia and Kazakhstan for supply of Uranium. The details of the contracts are:

- France - 300 MT of Uranium Ore Concentrates,
- Russian Federation - 2000 MT Natural Uranium Oxide Pellets spread over a period of five to six years starting from the year 2009; and one time supply of 58 MT of enriched Uranium Dioxide Pellets and
- Kazakhstan 2100 MT of Natural Uranium Ore Concentrate, spread over six years starting from the year 2009

([http://www.dae.nic.in/writereaddata/lssq299\\_141211.pdf](http://www.dae.nic.in/writereaddata/lssq299_141211.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.3223**  
TO BE ANSWERED ON 14.12.2011

### **BLAST AT FRENCH NUCLEAR SITE**

3223. SHRI PONNAM PRABHAKAR:

SHRI RAJAJIAH SIRICILLA:

Will the PRIME MINISTER be pleased to state:

- (a) whether the blast at French nuclear site is likely to hit India's nuclear plants;
- (b) if so, the details thereof; and
- (c) the steps taken to overcome such situation so far?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) No, Sir.

(b)&(c) The explosion did not take place in a nuclear power plant. It occurred in an oven dedicated to melt low and very low radioactive metallic waste at a nuclear waste management facility located in Codolet near Marcoule (Grad, South-East of France). The radioactivity was contained inside the building and there was no contamination. The incident has no bearing on the safety of nuclear power plants.

(<http://www.dae.nic.in/writereaddata/3223-lsus141211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.3278**  
TO BE ANSWERED ON 14.12.2011

### URANIUM RESERVES

3278. SHRI SIVASAMI C.:

Will the PRIME MINISTER be pleased to state:

- (a) whether the uranium deposits in the country are sufficient to meet the demand of our nuclear plants;
- (b) if so, the details thereof;
- (c) whether the uranium, found in India, is of better quality than found in other countries; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) Yes, Sir.
- (b) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of Department of Atomic Energy has established 1,72,390 tonnes in situ Uranium resources (U<sub>3</sub>O<sub>8</sub>) as on November, 2011. The currently known reserves of indigenous uranium in the country can support a nuclear programme with a generating capacity of about 10,000 MWe.
- (c)&(d) Quality of uranium found in India is comparable to any world-class deposits. However, in comparison to world occurrences, uranium deposits established in India are mostly of low-grade (less than 0.15% U). The average grade of Indian Uranium deposits range from 0.030 to 0.180% U<sub>3</sub>O<sub>8</sub>. The uranium deposits world over have a wide range of average grade, starting from 0.01 – 0.03% U at Witwatersrand, through 0.13 – 0.22% U at Ranger Deposits, Australia, to as high as 17.8% at McArthur River deposit, Canada(source IAEA Tech Doc.1629, 2009).

(<http://www.dae.nic.in/writereaddata/3278-lsus141211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.3286**  
TO BE ANSWERED ON 14.12.2011

### MEDICAL FACILITIES NEAR NUCLEAR PLANTS

3286. SHRI S.R. JEYADURAI:

Will the PRIME MINISTER be pleased to state:

- (a) whether there is adequate preparedness for medical emergencies in the vicinity of the nuclear power plants in the country;
- (b) if so, the details thereof;
- (c) the details of hospitals with haematology laboratories, bone marrow bank, immunology laboratories etc. near nuclear plants; and
- (d) the steps taken/being taken by the Government to provide these facilities in the vicinity of all nuclear power plants in the country?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) Yes Sir. At all nuclear power plants, medical services to cater to general health and occupational health related injuries are available. In addition, there are district hospitals/public health centers and private medical services available in the vicinity of nuclear power plant sites. The medical and para-medical professionals of these hospitals are trained and retrained periodically in attending to medical emergencies.
- (c) In addition to the medical services available at the nuclear power plants, empanelment with super-speciality hospitals in the nearby towns/villages are also in place. Hematology laboratories are available at most of the Government/private hospitals, primary health centres and nursing homes, while Immunology laboratories, bone marrow banks and other specialized services are available at the super-speciality hospitals.
- (d) Health care has been one of the focus areas of Nuclear Power Corporation of India Limited (NPCIL) Corporate Social Responsibility programme. Free medical services are being extended to the people living in the vicinity of nuclear power plants through mobile clinics and health centres. The scope of health care facilities to surrounding population around nuclear power plants is being further enhanced.

(<http://www.dae.nic.in/writereaddata/3286-lsus141211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.3319**  
TO BE ANSWERED ON 14.12.2011

### NUCLEAR POWER PLANTS

3319. SHRI GORAKHNATH PANDEY:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government proposes to expand the capacity of existing nuclear power plants in the country; and
- (b) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) The Current installed nuclear power capacity in the country is 4780 MW comprising twenty nuclear power reactors. Capacity of nuclear reactors cannot be enhanced beyond its design limits. In order to expand the total nuclear capacity Government is planning to install several new reactors. Seven nuclear power reactors with installed capacity of 5300 MW are presently at various stages of construction. On progressive completion of these projects, the installed nuclear power capacity is expected to reach 10,080 MW by 2017. The vision of the Government as projected in the Integrated Energy Policy is to reach a nuclear power capacity of 63,000 MW by the year 2032.

(<http://www.dae.nic.in/writereaddata/3319-lsus141211.pdf>)



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA

DEPARTMENT OF ATOMIC ENERGY

**LOK SABHA**

**UNSTARRED QUESTION NO.3346**

TO BE ANSWERED ON 14.12.2011

### IMPLEMENTATION OF CIVIL NUCLEAR LIABILITY ACT

3346. SHRI ARJUN RAY:

DR. MURLI MANOHAR JOSHI:

SHRI K.J.S.P. REDDY:

Will the PRIME MINISTER be pleased to state:

- (a) whether any efforts have been made by the Government to remove the doubts raised by some of the foreign countries on certain provisions of the Nuclear Liability Act;
- (b) if so, the details and the outcome thereof ; and
- (c) the manner in which Government proposes to ensure the safety of our people at the same time;

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)& (b) Following the passage of Civil Liability for Nuclear Damage Act, 2010 and before publication of Civil Liability for Nuclear Damage Rules, 2011, some potential suppliers had raised certain issues mainly relating to application of 'operator's right of recourse' as provided in Section 17 (b) and 'Act to be in addition to any other law' as provided in Section 46 of the Act.
- (c) Government of India attaches the highest importance to nuclear safety. Regular reviews of safety and upgrades of nuclear power plants to bring them to state of the art in terms of safety are an ongoing exercise. Post Fukushima (Japan) incident, safety review of all nuclear power stations have been conducted by the taskforces. The reviews have found that Indian nuclear power reactors are safe and have margins to withstand extreme natural events. They have also made recommendations to further enhance the safety. A roadmap for their implementation has been drawn up and the implementation has commenced.

In the wake of the Fukushima incident, a statement was also made on the floor of the Lok Sabha on 14 March 2011 informing that work is underway in the Department of Atomic Energy towards further strengthening India's national nuclear safety regulatory authority. Accordingly, a Bill titled 'The Nuclear Safety Regulatory Authority Bill, 2011' has been introduced in the Lok Sabha on 07th September 2011 and the same stance referred to the Department related Parliamentary Standing Committee on Science and Technology, Environment & Forests.

(<http://www.dae.nic.in/writereaddata/3346-lsus141211.pdf>)

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.3371**  
TO BE ANSWERED ON 14.12.2011

### IMPLEMENTATION OF CSR

3371. SHRI D.B. CHANDRE GOWDA:

SHRI S.R. JEYADURAI:

Will the PRIME MINISTER be pleased to state:

- the details of expenditure incurred by the Government during the last three years and the current year on Corporate Social Responsibility (CSR);
- whether the CSR policy is not being followed properly in some of the areas where nuclear power plants have been set up;
- if so, the details thereof and the reasons therefor alongwith the corrective steps taken/proposed to be taken by the Government in this regard;
- whether several welfare works carried out by the self help groups in nuclear power plants have not reached the interested beneficiaries; and
- if so, the details thereof and the steps taken/proposed to be taken by the Government in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- The details of expenditure incurred by the Public Sector Undertakings under the Department of Atomic Energy during the last three years and current year on Corporate Social Responsibility (CSR) are as under:

(Rs in lakh)

Year	NPCIL	3HAVINI	IREL	ECIL	UCIL
2008-09	44.08	33.72	216.30	-Nil-	42.90
2009-10	175.00	21.09	266.20	-Nil-	135.57
2010-11	309.55	26.63	278.25	-Nil-	182.66
Current year	111.90	6.58	166.66	35.91	150.00

- (b)&(c) Corporate Social Responsibility (CSR) activities are carried out as per the guidelines issued by Department of Public Enterprises from time to time.
- The benefits of CSR activities of Nuclear Power Corporation of India Limited (NPCIL) have reached the intended beneficiaries.
- Does not arise.

(<http://www.dae.nic.in/writereaddata/3371-lsus141211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.3413**  
TO BE ANSWERED ON 14.12.2011

### **COST AND BENEFIT OF KUDANKULAM PLANT**

3413. SHRI TARACHAND BHAGORA:

SHRI UDAY SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether costs and benefits of the proposed Kudankulam nuclear power project in Tamil Nadu have been ascertained;
- (b) if so, the details thereof;
- (c) whether the available staff at the Kudankulam nuclear power plant is finding it difficult to keep the system running safely; and
- (d) if so, the details thereof and the corrective steps taken/proposed to be taken by the Government in this regard?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) Yes Sir. The cost-benefit analysis of the project was carried out as a part of the project proposal put up for administrative approval and financial sanction. The Central Government accorded sanction for the project after ascertaining its costs and benefits in detail. The tariff of electricity generated by Kudankulam nuclear power plant is expected to be Rs. 2.50 per unit (kWh).
- (c)&(d) Kudankulam Nuclear Power Plants (KKNPP), Units 1&2 are at advanced stage of commissioning. Several reactor and auxiliary systems have been made functional. In spite of the recent protests, Nuclear Power Corporation of India Limited (NPCIL) has maintained the plant without degradation of components and systems.

(<http://www.dae.nic.in/writereaddata/3413-lsus141211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.3415**  
TO BE ANSWERED ON 14.12.2011

### CIVIL NUCLEAR AGREEMENT

3415. SHRI HAMDULLAH SAYEED:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has signed or proposes to sign civil nuclear agreement with South Korea;
- (b) if so, the details thereof;
- (c) whether there are proposals from other countries also for such agreement; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) & (b) An agreement between the Government of India and the Government of the Republic of Korea for cooperation in the Peaceful Uses of Nuclear Energy was signed on 25th July 2011. The Agreement came into force on 12th October 2011.
- (c) & (d) An Agreement with European Union for Research & Development (R&D) Cooperation in the Peaceful Uses of Nuclear Energy and an Agreement with Government of Japan for Cooperation in the Peaceful Uses of Nuclear Energy are under negotiation.

(<http://www.dae.nic.in/writereaddata/3415-lsus141211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.3443**  
TO BE ANSWERED ON 14.12.2011

### EXPORT OF NUCLEAR MATERIAL

3443. SHRI KACHHADIA NARANBHAI:

Will the PRIME MINISTER be pleased to state:

- (a) whether India has not exported nuclear material and technology during the last thirty years;
- (b) if so, the reasons therefor;
- (c) whether any initiatives have been taken so far in this direction; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) India has formulated lists of prescribed substances and prescribed equipment, and guidelines for their exports. These lists include nuclear materials, non-nuclear materials such as heavy water and nuclear grade graphite, and nuclear equipment. India has exported non-nuclear material and nuclear equipment in accordance with the Export Control guidelines. However, India has not exported any nuclear material.
- (c) & (d) India has signed bilateral agreement for co-operation for peaceful uses of nuclear energy with several countries including USA, France, Russia, Namibia, Argentina, Kazakhstan, South Korea and Canada. These agreements provide for export of nuclear equipment in accordance with the Export Control Procedures.

(<http://www.dae.nic.in/writereaddata/3443-lsus141211.pdf>)

## **Nuclear and Arms Control Centre**

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**Ministry of External Affairs**

**LOK SABHA**

**UNSTARRED QUESTION NO.3293  
TO BE ANSWERED ON 14.12.2011**

### **KODANKULAM NUCLEAR POWER PLANT**

3293. SHRI P.R. NATARAJAN:

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the United States of America had agreed to supply Nuclear Reactors for Kodankulam Nuclear Power Plant (Tamil Nadu) in the recent past;
- (b) if so, the details thereof;
- (c) if not, the reasons therefor;
- (d) whether the United States of America had objected supply of reactors by Russia for the above plant; and
- (e) if so, the reaction of the Government thereto?

#### **ANSWER**

**THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SMT. PRENEET KAUR)**

- (a) to (e) The United States has not offered to supply nuclear reactors for the Kodankulam Nuclear Power Plant. The United States has not objected to supply of reactors by Russia for the Kodankulam project.

(<http://meindia.nic.in/mystart.php?id=100518778>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO : 221**  
TO BE ANSWERED ON 08.12.2011

### AGITATION AGAINST KUDANKULAM NUCLEAR PLANT

\*221. SHRI D. BANDYOPADHYAY:

Will the PRIME MINISTER be pleased to state:

- (a) whether Government is aware of the two decade old public agitation against setting up of the Nuclear Power Plant at Kudankulam in Tamil Nadu;
- (b) if so, the action Government proposes to take to meet the objections of agitating citizens of the area;
- (c) in view of this continued agitation whether Government is considering the option of fuel switch to allay apprehension of local population; and
- (d) whether fuel rods are being loaded in the first unit of the plant without the appropriate Environment Impact Assessment Report, in conformity with the Environment Impact Assessment Guidance Manual of March, 2010 of the Ministry of Environment and Forests?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a) to (d) A statement is laid on the Table of the House

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION NO.221 FOR ANSWER ON 08.12.11 BY SHRI D. BANDYOPADHYAY REGARDING AGITATION AGAINST KUDANKULAM NUCLEAR PLANT

- (a) Soon after approval of the site in the year 1988 by the Central Government, there were some protests by a section of population around Kudankulam due to apprehensions on safety and radiation generated from Chernobyl accident in Ukraine. Since the start of the project construction in the year 2002, the work has been progressing in total harmony with surrounding population. The recent agitation against the Kudankulam project by a section of the local people started about three months ago, due to the apprehensions about the safety following the Fukushima (Japan) incident and campaigns by groups ideologically opposed to nuclear power.
- (b) The Central Government has constituted an expert group comprising of 15 specialists with expertise in diverse fields to interact with the officials of state government and spokespersons of the people in the neighbourhood of Kudankulam. The expert group has addressed all the legitimate questions raised. Efforts to enhance public outreach and public communication are continuing.
- (c) No, Sir.
- (d) Fuel loading in the nuclear power reactors requires the permission of Atomic Energy Regulatory Board (AERB) in India. It does not have any linkage with Environment Impact Assessment (EIA).

([http://www.dae.nic.in/writereaddata/rssq221\\_081211.pdf](http://www.dae.nic.in/writereaddata/rssq221_081211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO : 228**  
TO BE ANSWERED ON 08.12.2011

### LOWER POWER GENERATION BY ATOMIC ENERGY PLANTS

\*228. SHRIMATI SHOBHANA BHARTIA :

Will the PRIME MINISTER be pleased to state:

- (a) whether Government is aware that atomic energy plants in the country have been generating energy below their installed capacity;
- (b) if so, the factors responsible for the same; and
- (c) the steps Government proposes to take to optimally utilise the atomic energy plants?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) to (c) A statement is laid on the Table of the House
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#### STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION NO.228 FOR ANSWER ON 08.12.11 BY SHRIMATI SHOBHANA BHARTIA REGARDING REASONS FOR LOWER POWER GENERATION BY ATOMIC PLANTS

- (a)&(b) The present installed nuclear power capacity in the country is 4780 MW comprising of twenty nuclear power reactors. Of these, ten reactors with a capacity of 2840 MW comprising KGS - 1 to 4 (4 x 220 MW), NAPS - 1&2 (2 x 220 MW), MAPS - 1&2 (2 x 220 MW) and TAPS - 3&4 (2 x 540 MW) are fuelled by indigenous fuel, which is not available in the required quantity. These are, accordingly, being operated at lower power levels matching the fuel supply.

The remaining ten nuclear power reactors with a capacity of 1940 MW are under International Atomic Energy Agency (IAEA) safeguards, in accordance with the separation plan. Of these, presently one reactor (RAPS-1, 100 MW) is under long shut down for techno-economic assessment on continuation of operation. The remaining nine reactors under IAEA safeguards use imported fuel, which is available in required quantity. These reactors are operating at rated capacity.

- (c) The Central Government's efforts are to augment domestic fuel supply by opening new mines and processing facilities which has resulted in improvement in domestic fuel supply. The capacity factors of Indian nuclear power reactors fueled by indigenous uranium have registered an improvement from 50% in 2008-09 to 61% in 2009-10, 71% in 2010-11 and 78% in the current year (April-October 2011).

([http://www.dae.nic.in/writereaddata/rssq228\\_081211.pdf](http://www.dae.nic.in/writereaddata/rssq228_081211.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO : 239**  
TO BE ANSWERED ON 08.12.2011

### CLOSING DOWN OF IRE, KOLLAM UNIT

\*239. SHRI K. N. BALAGOPAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether Government has taken note of the threat due to closing of Indian Rare Earths (IRE) Unit in Kollam, Kerala;
- (b) if so, the details thereof; and
- (c) whether Government would relook into the present policy about rare earths and initiate steps to start more value added products under the Public Sector?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a) to (c) A statement is laid on the Table of the House

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION  
NO.239 FOR ANSWER ON 08.12.11 BY SHRI K.N. BALAGOPAL REGARDING  
CLOSING DOWN OF IREL UNIT

(a) Yes, Sir.

(b) Due to various operational factors beyond the control of Indian Rare Earths Limited (IREL), supply of raw material to the Chavara Plant from its mining area was suspended on 10.10.2011 and consequently from 24.10.2011, production was stopped. As there is no certainty about resumption of supply of raw material from mining sites, a letter dated 21.11.2011 seeking permission for lay off of its workmen at Chavara was sent to the appropriate authority.

(c) IREL has already taken steps in this regard and is in the process of signing an MoU with Kerala State Industrial Development Corporation for the value added products including rare earths subject to availability of adequate raw sand required for producing basic source material for value addition.

([http://www.dae.nic.in/writereaddata/rssq239\\_081211.pdf](http://www.dae.nic.in/writereaddata/rssq239_081211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1708**  
TO BE ANSWERED ON 08.12.2011

### GUIDELINES FOR HANDLING OF RADIOACTIVE SUBSTANCES

1708. SHRI VIJAY JAWAHARLAL DARDA:

Will the PRIME MINISTER be pleased to state:

- (a) whether guidelines from Atomic Energy Establishment exist regarding purchase, storage, period of storage and ultimate disposal of radioactive substances like 'Cobalt 60 isotope' as its sudden suomoto eruption caused deaths and illness to many persons in Delhi's Mayapuri Scrap Market, during July-Aug. 2010;
- (b) if so, whether the purchasers of such radioactive substances are following these guidelines for storage, disposal, etc.;
- (c) whether a similar complaint of unauthorized storage in a godown of a chemical unit in Sewri, Mumbai was received during September/October, 2010; and
- (d) if so, the action taken thereon?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) Yes, Sir. Atomic Energy (Radiation Protection) Rules, 2004 and Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987 framed under Atomic Energy Act 1962, and Safety Standards and Codes made there under provide necessary frame work of regulations pertaining to import, export, procurement (local purchase), installation, operation, decommissioning/disposal as well as transport of devices containing radioactive material. The regulatory frame work has a 'cradle to grave' approach wherein the radioactive sources are regulated right from their production / procurement to ultimate safe disposal. In each step an authorization/licence is required from the regulatory body i.e. Atomic Energy Regulatory Board (AERB).

The incident involving exposure to seven persons, resulted in the death of a person and radiation injuries to two persons due to a legacy source (Cobalt-60) took place at Mayapuri, Delhi in April 2010. The source found its way to the public domain due to unauthorized disposal of a Gamma Cell by Delhi University (DU). Investigation and corrective actions were promptly taken to recover and secure the radiation sources.

To prevent the recurrence of such incident many actions including the following were undertaken by AERB.

- Sensitizing all the academic, medical and R&D institutions to undertake inventory of radiation sources under their possession and review their existing safety procedures.
- Further strengthening the AERB Data base on source inventory by identifying and bringing on record the legacy sources.

## **Nuclear and Arms Control Centre**

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- Improving and intensifying the public awareness on legal, regulatory and general safety requirements vis-à-vis radioactive sources by way of issuing notices through print media and knowledge sharing through its website.
  - Establishing Regional Regulatory Centres (RRC) in the country. RRC in East and South have been formed to further strengthen regulation of radiation sources.
  - Based on lessons learnt from this experience the system of response to radiation source related emergencies is further strengthened in collaboration with National Disaster Management Authority (NDMA).
- (b) Licensees generally follow the stipulated guidelines. However, there have been stray incidents of violating such stipulated guidelines by the licensees. In such cases, AERB had taken appropriate corrective and punitive actions in these situations.
- (c)&(d) AERB has not received any complaint regarding unauthorized storage of radioactive substance in a godown of chemical unit at Sewri.

([http://www.dae.nic.in/writereaddata/rsus1708\\_081211.pdf](http://www.dae.nic.in/writereaddata/rsus1708_081211.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1709**  
TO BE ANSWERED ON 08.12.2011

### URANIUM MINES IN TUMMALAPALLE

1709. SHRIMATI GUNDU SUDHARANI:

Will the PRIME MINISTER be pleased to state:

- whether Tummalapalli uranium mines are said to have the world's largest uranium reserves;
- if so, the details thereof;
- the amount and different kinds of uranium that India is exporting to other countries during the last ten years, year wise, country-wise and variety-wise;
- the amount and different kinds of uranium that India is importing from other countries during the last ten years, year wise, country-wise and variety-wise; and
- in what manner the discovery at Tummalapalli helps India to become self sufficient in uranium and the quantity of power that we can generate with it?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- &(b) No, Sir. The Atomic Minerals Directorate for Exploration and Research(AMD), a constituent unit of the Department of Atomic Energy, has so far established the presence of 63,269 tonnes of Uranium resources (U3O8) in Tummalapalle area, Kadapa District, Andhra Pradesh.
- No exports of uranium have taken place during the said period.
- The quantity of uranium imported during the said period is as follows:

	Year	Quantity Received	Type of Uranium imported
Russia	2001	Enriched Uranium Di-oxide Pellets	
	2006		
	2009		
	2009	Natural Uranium Di-oxide Pellets	
	2010		
	2011		
France	2009	Natural Uranium Ore Concentrate	
Kazakhstan	2010	Natural Uranium Ore Concentrate	
	2011		

## **Nuclear and Arms Control Centre**

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- (e) The indigenous Uranium will help India to increase nuclear installed capacity, thereby, providing more electricity for economic growth of the country. Uranium reserves already established at Tummalapalle can generate above 2,50,000 MWe-year of electricity (~ 6000 MWe capacity for 40 years).

([http://www.dae.nic.in/writereaddata/rsus1709\\_20081211.pdf](http://www.dae.nic.in/writereaddata/rsus1709_20081211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1710**  
TO BE ANSWERED ON 08.12.2011

### SUSPENSION OF KUDANKULAM ATOMIC PROJECTS

1710. SHRI GOVINDRAO ADIK:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that the Tamil Nadu Cabinet has called for the suspension of the Kudankulam nuclear project execution until the apprehensions of people were allayed;
- (b) whether safety steps had been taken by the Department in all nuclear plants;
- (c) if so, the details of the steps taken so far;
- (d) whether Government is going to commission the project as per schedule;and
- (e) whether Government would launch a vigorous public relations campaign to counter the 'misinformation campaign' against the Kudankulam nuclear project?

### ANSWER

**THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):**

- (a) The Tamil Nadu cabinet passed a resolution on September 22, 2011 as follows: "The cabinet decided to request the Honorable Prime Minister and Government of India that further work on Kudankulam Nuclear Power Project may be halted till the fears of the people of the area are allayed".
- (b&c) The safety provisions in all the Indian nuclear power plants are of the state of the art and at par with international safety norms. Recently under the directives of the government, the safety of all Indian nuclear power plants was reviewed in the context of Fukushima (Japan) incident by task forces of Nuclear Power Corporation of India Limited (NPCIL) and a committee constituted by Atomic Energy Regulatory Board (AERB). The reviews have found that Indian nuclear power plants are safe and have margins in design and features to withstand extreme natural events. Recommendations were made to add some features to take the safety to a still higher level. The implementation of these recommendations has already commenced. In addition the Government has also taken following steps:
  - Introduced the Nuclear Safety Regulatory Authority (NSRA) Bill in the Parliament to give statutory status to the nuclear safety regulator
  - Took a decision to invite IAEA missions, namely, Operational Safety Review Team (OSART) and Integrated Regulatory Review Service (IRRS), for peer review of safety of nuclear power plants and of the regulatory system respectively.
- (d) Based on the present situation, Kudankulam units 1&2 are now expected to be commissioned in 2012-13.

## **Nuclear and Arms Control Centre**

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- (e) The government is making all efforts to allay the fears of the people in a credible manner. The Government has constituted an expert group of 15 specialists with expertise in diverse fields to interact with the officials of state government and spokespersons of the people in the neighbourhood of Kudankulam. The expert group has addressed all the legitimate issues raised. Efforts to enhance public outreach and public communication are continuing.

([http://www.dae.nic.in/writereaddata/rsus1710\\_081211.pdf](http://www.dae.nic.in/writereaddata/rsus1710_081211.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1711**  
TO BE ANSWERED ON 08.12.2011

### TARGET OF NUCLEAR POWER GENERATION

1711. SHRI MOHD. ALI KHAN:

Will the PRIME MINISTER be pleased to state:

- whether India is to produce 35,000 MW of nuclear power by 2020;
- if so, the details worked out so far;
- the investment made/to be made in this regard; and
- in what manner Government would use such nuclear power, area-wise and purpose thereof?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)&(b) Present installed nuclear power capacity in the country is 4780 MW which is expected to reach 10,080 MW on progressive completion of the nuclear power reactors under construction by the year 2017.

The future capacity addition plans envisage a mix of nuclear power reactors based on indigenous technologies and those with foreign technical cooperation. Currently, the XII Plan proposals are being finalized which envisage start of work on eight indigenous 700 MW Pressurised Heavy Water Reactors (PHWRs), two 500 MW Fast Breeder Reactors (FBRs), one 300 MW Advanced Heavy Water Reactor (AHWR) and eight Light Water Reactors of 1000 MW or higher capacity with foreign technical cooperation. These nuclear power reactors are expected to be completed progressively in the XIII and XIV Plans. Based on progressive completion of these projects, a nuclear power capacity of 14580 MW is expected to be reached by 2020-21 and 27480 by 2023-24.

- (b) The investment made so far and to be made in the XII Plan and beyond is as under

(in crore) Capacity	Investment upto end of XI Plan	Investment in XII Plan	Investment beyond XII Plan
In operation (4780 MW)	21,056	650	-
Under construction (5300 MW)	21,955	21,245	2,195
Planned new starts in XII Plan (17400 MW)	1,997	64,812	1,22,874



## **Nuclear and Arms Control Centre**

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- (d) The nuclear power plants will generate electricity, which will be supplied to the States and Union Territories in the Northern, Western and Southern Electricity Regions of the country.

([http://www.dae.nic.in/writereaddata/rsus1711\\_081211.pdf](http://www.dae.nic.in/writereaddata/rsus1711_081211.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1712**  
TO BE ANSWERED ON 08.12.2011

### **ACCIDENTS IN KUDANKULAM NPP**

1712. SHRI P. RAJEEVE:

Will the PRIME MINISTER be pleased to state:

- (a) whether, in case of accidents involving the first two reactors at the Kudankulam Nuclear Power Plant, Russian supplier Atomstroyexport would be held liable for damages as per provisions of the Civil Liability for Nuclear Damage Act, 2010; and
- (b) if not, the indemnification clauses as per the Inter-governmental Agreement and the Supplement to it signed between Atomstroyexport and NPCIL, with details thereof?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) & (b) - The Kudankulam project (2x1000 MW) at Kudankulam in Tirunelveli District of Tamilnadu is being set up in technical cooperation with the Russian Federation. While the design and supply of equipment are in the Russian scope, construction, erection of equipment, commissioning are being carried out by Nuclear Power Corporation of India Limited (NPCIL). NPCIL being the operator of the plant will be held liable for any nuclear damage caused by it as per the provisions of the Civil Liability for Nuclear Damage Act, 2010.

([http://www.dae.nic.in/writereaddata/rsus1712\\_081211.pdf](http://www.dae.nic.in/writereaddata/rsus1712_081211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1713**  
TO BE ANSWERED ON 08.12.2011

### SITE FOR NUCLEAR POWER PLANT

1713. SHRI V.P. SINGH BADNORE:

Will the PRIME MINISTER be pleased to state:

- the number of sites that have been identified or selected for Nuclear Power Plant in the country;
- the details thereof;
- whether these sites for Nuclear Power Plants have been cleared by various States;
- if so, the details thereof; and
- the criteria that has been made for these selections?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- The Government has accorded 'in principle' approval of eleven sites for setting up nuclear power plants in future.
- The details of sites for setting up nuclear power plants in future are as under

Site	District & State	Capacity (MW)
Gorakhpur	Fatehabad, Haryana	4X700
Chutka	Mandla, Madhya Pradesh	2X700
Mahi Banswara	Banswara, Rajasthan	4X700
Bhimpur	Shivpuri, Madhya Pradesh	4X700
Kaiga	Uttara Kannada, Karnataka	2X700
Kalpakkam	Kanchipuram, Tamilnadu	2X500
Kudankulam	Tirunelveli, Tamilnadu	4X1000
Jaitapur	Ratnagiri, Maharashtra	6X1650
Chhaya Mithi Viridi	Bhavnagar, Gujarat	6X1000
Kovvada	Srikakulam, Andhra Pradesh	6X1000
Haripur	East Midnapore, West Bengal	6X1000

## Nuclear and Arms Control Centre

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- (c)&(d) Yes, Sir. The sites are jointly identified by the State Government concerned, Nuclear Power Corporation of India Limited (NPCIL) and Department of Atomic Energy for evaluation by a Site Selection Committee (SSC) appointed by the Government of India. The SSC comprises members from the Central Electricity Authority, Ministry of Environment & Forests, Atomic Energy Regulatory Board (AERB) and constituent units of the Department of Atomic Energy etc. The reports of the SSC are considered by the Government and 'in principle' approval is accorded for obtaining statutory clearances and project approvals.
- (e) The sites are evaluated by the SSC based on criteria laid down in the AERB's 'Code of Practice on Safety in Nuclear Power Plant Siting'. The criteria, among others include foundation conditions, seismicity, meteorological conditions, flooding, distance from airports/air corridors, industries handling toxic/ explosive substances, access by road/rail/sea, demand for power in the region, other energy options, possibility of power evacuation, availability of land and cooling water etc.

([http://www.dae.nic.in/writereaddata/rsus1713\\_081211.pdf](http://www.dae.nic.in/writereaddata/rsus1713_081211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1714**  
TO BE ANSWERED ON 08.12.2011

### NEW RULES FOR CIVIL NUCLEAR LIABILITY ACT

1714. SHRI D. RAJA:

SHRI M.P. ACHUTHAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether Government has notified new rules on Civil Nuclear Liability Act;
- (b) if so, the details thereof;
- (c) whether the new rules are in conformity with the Nuclear Liability Act passed by Government or a dilution and violation of the spirit of the Law; and
- (d) if so, the details and reasons therefor?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) Yes Sir.
- (b) The Central Government, in exercise of powers conferred by Section 48 of the Civil Liability for Nuclear Damage Act, 2010 has notified the Civil Liability for Nuclear Damage Rules, 2011 in the Gazette of India on 11 November 2011, which have been laid before each House of Parliament.
- (c)&(d) Yes Sir. The Civil Liability for Nuclear Damage Rules, 2011 is in conformity with the Civil Liability for Nuclear Damage Act, 2010.

([http://www.dae.nic.in/writereaddata/rsus1714\\_081211.pdf](http://www.dae.nic.in/writereaddata/rsus1714_081211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1715**  
TO BE ANSWERED ON 08.12.2011

### **VIEWS AGAINST GO-AHEAD OF KUDANKULAM**

1715. SHRI PIYUSH GOYAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether the senior retired bureaucrats and other Government officials have written against the go-ahead of the Kudankulam nuclear plant;
- (b) if so, the details thereof;
- (c) whether Government has conducted an assessment of the impact of the nuclear plant;
- (d) if so, the details thereof; and
- (e) if not, the reasons therefor?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)&(b) Some senior retired bureaucrats have asked for a hold on Kudankulam nuclear plant. They have also raised several issues related to safety of nuclear power plants, independence of regulatory body, civil liability of nuclear damage which are common for all nuclear power plants and not specific to Kudankulam Nuclear Plant.
  - (c)&(d) Yes, Sir. A rapid Environmental Impact Assessment (EIA) of the Kudankulam Nuclear Power Project (KKNPP-1&2) was carried out in 2001 and a detailed EIA in 2003. Later, a comprehensive EIA of the site for six units was carried out as a part of KKNPP-3 to 6 environmental clearance process.
  - (e) Does not arise.
- ([http://www.dae.nic.in/writereaddata/rsus1715\\_081211.pdf](http://www.dae.nic.in/writereaddata/rsus1715_081211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1716**  
TO BE ANSWERED ON 08.12.2011

### NOTIFICATION OF RULES UNDER CIVIL NUCLEAR LIABILITY ACT

1716. DR. T.N. SEEMA:

SHRI D. BANDYOPADHYAY:

Will the PRIME MINISTER be pleased to state:

- (a) whether Government has notified the rules under the Civil Nuclear Liability Act;
- (b) if so, the details thereof;
- (c) whether Government has noticed that the rules have diluted the provisions of liability for the foreign suppliers under the Act; and
- (d) whether Government would amend the rules notified now so as to fix the foreign supplier's liability for damages to cover the full life of the reactor or at least a reasonable period of its functioning?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) Yes, Sir.
- (b) The Central Government in exercise of powers conferred by Section 48 of the Civil Liability for Nuclear Damage Act, 2010 has notified the Civil Liability for Nuclear Damage Rules, 2011 in the Gazette of India on 11 November 2011, which have been laid before each House of Parliament.
- (c) No, Sir.
- (d) The Central Government does not propose to amend the Civil Liability for Nuclear Damage Rules, 2011.

([http://www.dae.nic.in/writereaddata/rsus1716\\_081211.pdf](http://www.dae.nic.in/writereaddata/rsus1716_081211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1717**  
TO BE ANSWERED ON 08.12.2011

### INDO-FRENCH AGREEMENT ON NUCLEAR REACTORS

1717. SHRI NARESH GUJRAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that the Prime Ministers of India and France have entered into an agreement for the construction of first set of two third-generation European Pressurised Reactors which would supply nuclear fuel for 25 years;
- (b) if so, the details thereof;
- (c) the progress that has been on this agreement;
- (d) the impact that the Civil Liability for Nuclear Damage Bill 2010 had on this deal; and
- (e) the total share of India's investment in this deal and in what manner these payments would be made to the French Government?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)to(c) India and France have signed an Inter Governmental Agreement for Civil Nuclear Cooperation. Subsequently, Nuclear Power Corporation of India Limited (NPCIL) has entered into an MoU with the French company AREVA for setting up of 2 EPR nuclear reactors in Jaitapur, Maharashtra.
- (d)&(e) Issues such as liability, cost, payment terms will come up while finalizing the techno commercial agreement.

([http://www.dae.nic.in/writereaddata/rsus1717\\_081211.pdf](http://www.dae.nic.in/writereaddata/rsus1717_081211.pdf))



## Nuclear and Arms Control Centre

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Ministry of External Affairs  
RAJYA SABHA  
UNSTARRED QUESTION NO.1757  
TO BE ANSWERED ON 08.12.2011

### DEPLOYMENT OF NUCLEAR MISSILES BY CHINA

1757. SHRI Y.S. CHOWDARY:  
SHRI T.K. RANGARAJAN:

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether it is a fact that China is posing a threat to India's security by deploying nuclear missiles close to Sino-India border;
- (b) if so, the details thereof; and
- (c) the steps/measures taken/being taken by Government to build strong logistics on the frontier?

#### ANSWER

THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SHRI E. AHAMED)

- (a) to (c) Government pays close attention to China's military modernization programme as well as its infrastructure development projects in the border regions opposite India in the Tibet and Xinjiang Autonomous Regions. Since 1993, the two Governments have maintained peace and tranquility along the Line of Actual Control (LAC) in the India-China border areas. The two sides have reiterated their commitment to this goal on many occasions. Government is giving careful and special attention to the development of the border areas opposite China, in order to meet our strategic and security requirements and also to facilitate the economic development of these areas. Government keeps a constant watch on all developments having a bearing on India's security and takes all necessary measures to safeguard it.

(<http://meaindia.nic.in/mystart.php?id=100518712>)

## Nuclear and Arms Control Centre

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Ministry of External Affairs  
LOK SABHA  
UNSTARRED QUESTION NO.2103  
TO BE ANSWERED ON 07.12.2011

### NUCLEAR REACTORS

2103. SHRI RAVNEET SINGH:

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the operations of French and US Companies for building nuclear reactors in India are dependent on nuclear cooperation negotiations with Japan;
- (b) if so, the details thereof;
- (c) the conditions that Japan is expected/has made for signing nuclear treaty;
- (d) whether the Government of Australia has agreed to provide fuel for our nuclear reactors; and
- (e) if so, the details thereof and the time by which the fuel is likely to be provided by Australia for the Indian reactors?

### ANSWER

THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SMT. PRENEET KAUR)

(a) to (c) On 25 June 2010, the Government of Japan announced its decision to commence negotiations with the Government of India on an Agreement for Cooperation in the Peaceful Uses of Nuclear Energy. Three rounds of negotiations have been held so far. Discussions are continuing on a draft Nuclear Cooperation with Japan. An inter-governmental agreement between India and Japan will enable Japanese companies to participate in India's nuclear programme, directly or by way of supplying material and equipment to other vendors building nuclear reactors in India.

(d) & (e) There are press reports that Australia is considering supply of Uranium to India. It is not possible as yet to provide the time by which Uranium for our reactors will be available from Australia.

(<http://meaindia.nic.in/mystart.php?id=100518696>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 186**  
TO BE ANSWERED ON 07.12.2011

### SAFETY PARAMETERS FOR NUCLEAR POWER PLANTS

\*186. SHRI NIKHIL KUMAR CHOUDHARY:  
SHRI BALIRAM JADHAV:

Will the PRIME MINISTER be pleased to state:

- (a) whether the safety parameters maintained at Kudankulam Nuclear Power Plant are at par with the Nuclear Power Plants in major developed countries like USA, France and Britain and if so, the details thereof;
- (b) whether action on all the findings/recommendations of the bodies which undertook safety review of Indian Nuclear Power Plants have been initiated;
- (c) if so, the details thereof and if not, the reasons therefor;
- (d) whether some of the States including Tamil Nadu, scientists, academicians, ex-army chiefs and ex-administrators have objected to setting-up of nuclear plants in the country in general and Kudankulam in particular and if so, the details thereof; and
- (e) the reaction of the Government thereto;

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) to (e) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO. 186 FOR ANSWER ON 07.12.2011 BY SHRI NIKHIL KUMAR CHOUDHARY AND SHRI BALIRAM JADHAV REGARDING SAFETY PARAMETERS FOR NUCLEAR POWER PLANTS.

- (a) The safety provisions of the Kudankulam nuclear power plant are at par with those in nuclear power plants in major developed countries like USA, France & Britain and in line with provisions of the International Atomic Energy Agency (IAEA). In fact, some of the safety features of the Kudankulam nuclear power plant are more advanced. As per the policy, any reactor to be set up in the country with foreign technical cooperation is required to meet the safety norms prescribed by the regulatory authorities in the country of origin as well as the Atomic Energy Regulatory Board (AERB) in India. The reactors being set up at Kudankulam meet both the Russian and Indian regulatory requirements on safety.
- (b)&(c) Following the Fukushima (Japan) incident, the government directed safety reviews of the Indian nuclear power plants in operation and under construction. Accordingly, the safety review of Indian nuclear power plants was carried out by task forces of Nuclear Power Corporation of India Limited (NPCIL) and a committee set up by the Atomic Energy

## **Nuclear and Arms Control Centre**

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Regulatory Board (AERB). These reviews have found that Indian reactors are safe and have sufficient margins and features in design to withstand extreme natural events. The task forces of NPCIL and the AERB committee have recommended installations for enhancing safety to a still higher level. A roadmap for implementation of the recommendations, in a time bound manner, has been drawn up and the process of implementation has commenced.

- (d) The Kudankulam site was offered by the State Government and found suitable by the Site Selection Committee (SSC) of the Government based on in-depth evaluation in accordance with the AERB 'Code of Practice on Safety in Nuclear Power Plant Siting'. The Central Government accorded approval to this site in 1988. The construction started in 2002 after administrative approval and financial sanction of the project by the Central Government. The work has progressed with the full cooperation of the State Government and in total harmony with the local population. However, recently, there have been protests by a section of local people against startup of the project, due to apprehensions about safety in the wake of Fukushima incident and campaign by groups ideologically opposed to nuclear power.

Some scientists, academicians, one ex-navy chief and ex-administrators have raised issues related to country's energy policy, safety of nuclear power, Independence of regulatory body, review of statutes like Civil Liability for Nuclear Damage Act and asked for a hold on setting up new nuclear power projects.

- (e) India's energy needs are huge and growing and given our limited availability resources, all energy sources need to be deployed optimally. Nuclear power is an important clean energy option that can provide long term energy security for the country. It will be pursued, with full regard to safety, security and protection of environment and livelihood of the local people.

([http://www.dae.nic.in/writereaddata/lssq186\\_071211.pdf](http://www.dae.nic.in/writereaddata/lssq186_071211.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 192**  
TO BE ANSWERED ON 07.12.2011

### NUCLEAR CAPACITY

\*192. SHRI VIRENDER KASHYAP:

SHRI PRALHAD JOSHI:

Will the PRIME MINISTER be pleased to state:

- the details of the present nuclear power capacity of the country vis-à-vis the major developing and the developed countries and the long term perspective plans to achieve capacity addition by the end of 2032;
- the funds allocated/spent on various atomic power plants during the last three years, plant-wise; and
- the steps taken/proposed to be taken by the Government to provide sufficient quantity of fuel to the existing and proposed nuclear power plants;

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) to (c) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO. 192 FOR ANSWER ON 07.12.2011 BY SHRI VIRENDER KASHYAP AND SHRI PRALHAD JOSHI REGARDING NUCLEAR CAPACITY.

- (a) The present installed nuclear power capacity in the country is 4780 MW. The installed nuclear power capacity in some of the developing countries and the developed countries is given below.

Country	Nett Installed Capacity (MW)
Developing Countries	
Armenia	375
Brazil	1884
China	11078
Iran	915
Pakistan	725
Developed Countries	
Canada	12624
France	63130
Japan	44215
South Korea	18698
Russian Federation	22693
USA	101240

(Source: PRIS, IAEA.)

## Nuclear and Arms Control Centre

At present, a capacity of 5300 MW is under construction in the country. With the progressive completion of nuclear power reactors under construction, the nuclear power capacity will reach to 10080 MW by the year 2017. More nuclear power plants based on both indigenous technologies and with international cooperation are planned to augment the installed nuclear power capacity in near and mid-term. The Government vision, as projected in integrated Energy Policy of the country, is to reach nuclear power capacity of 63,000 MW by the year 2032.

- (b) The details of allocation and expenditure on projects under construction during the last three years (in Crore) are:

Project	Capacity (MW)	Status	2008-09		2009-10		2010-11	
			Allocation (BE)	Expenditure	Allocation (BE)	Expenditure	Allocation (BE)	Expenditure
Kaiga 3&4	2x220	Completed	108	181	18	133	233	139
RAPP 5&6	2x220	Completed	215	137	125	208	0	0
KKNPP 1&2	2x1000	Under Commissioning	1313	1366	855	1083	377	804
KAPP 3&4	2x700	Under Construction	110	91	400	150	344	353
RAPP 7&8	2x700	Under construction	0.05	0	200	166	103	288

(Note: The KAPP 3&4 and RAPP 7&8 projects were sanctioned in October 2009.)

- (c) The Central Government has taken steps to augment the domestic uranium availability by opening of new mines and processing facilities. A new mine and a mill at Tummalapalle in Andhra Pradesh are at an advanced stage of completion and expected to start production by end of 2011-12. The Central Government has also entered into fuel supply contracts with foreign countries for supply of fuel for reactors under IAEA safeguards, as per the separation Plan.

([http://www.dae.nic.in/writereaddata/lssq192\\_071211.pdf](http://www.dae.nic.in/writereaddata/lssq192_071211.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2076**  
TO BE ANSWERED ON 07.12.2011

### INDIAN RARE EARTHS LIMITED

2076. SHRI KODIKKUNNIL SURESH:

Will the PRIME MINISTER be pleased to state:

- the total quantity of rare earth material extracted and sold by Indian Rare Earths Limited during the last three years and the current year, year-wise;
- whether the Indian Rare Earths Limited has sold its products especially Ilmenite to private companies;
- if so, the details thereof and the reasons therefor;
- whether Indian Rare Earths Limited at Chavara has incurred huge losses due to the fraudulent sale of Ilmenite; and
- if so, the details thereof and the action taken by the Government in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- Indian Rare Earths Ltd.(IREL) a public sector undertaking under the Department of Atomic Energy has not extracted rare earth material from monazite during the last three years. However, the Company has sold small quantities of rare earth compounds available in stock in domestic market. The details of supply thereof during 2008-09, 2009-10, 2010-11 and current year 2011-12 (upto November 2011) are given in the enclosed Annexure –A.
- Yes, Sir.
- For Ilmenite, the major customers are Synthetic Rutile (SR) and Titanium Dioxide (TiO<sub>2</sub>) producers. Details of Synthetic Rutile and TiO<sub>2</sub> producers are given below:

Sl.No.	Party	Sector
1.	Cochin Minerals & Rutile Ltd., Alwaye	Private
2.	DCW Ltd., Thootukody	Private
3.	Kerala Minerals & Metals Ltd., Chavara	Kerala State PSU
4.	Kilburn Chemicals, Thootukody	Private
5.	Kolmak Chemicals, Kolkata	Private
6.	Travancore Titanium Products Ltd. TVM	Kerala State PSU

#1 & 2 are SR producers and the rest are TiO<sub>2</sub> producers.

As can be seen from the above, there are only two companies in the public sector with one of them having own mining and mineral separation facility who require material only when they

## **Nuclear and Arms Control Centre**

cannot meet their requirement through their internal resources. Thus, out of five potential major buyers of Ilmenite four are from private sector and one is PSU and accordingly sales to private sector are imperative for sustained operations of the Company.

In addition to the above, there are numerous small customers who produce welding electrodes and ferro alloys who are almost entirely in private sector mainly SSI units that procure relatively small tonnage of Ilmenite as compared to the SR/TiO<sub>2</sub> producers.

IREL is a commercial organisation. Decisions relating to sales are made in accordance with the delegation of powers by Board of Directors to the Chairman & Managing Director (CMD) and Functional Directors. Sales decisions in respect to quantity and price are influenced by factors that include, the need for IREL to maintain its market presence in various user sectors in domestic and international markets; maintain its market presence and hold it to its customers in a sustainable manner in the long term; differential rates were necessary between different buyers depending on whether they are part-competitors to IREL, or depend on IREL only for their materials supplies; and achieve customer loyalty in the long run.

(d) No, Sir.

(e) Not applicable in view of reply to (d) above.

(<http://www.dae.nic.in/writereaddata/2076-lsus071211.pdf>)



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.2228**  
TO BE ANSWERED ON 07.12.2011

### NEW RULES FOR CIVIL NUCLEAR LIABILITY

2228. SHRI GURUDAS DASGUPTA:

SHRI SUGUMAR K.:

SHRI SURESH KUMAR SHETKAR

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has notified the rules for implementation of Civil Nuclear Liability Act;
- (b) if so, the details thereof;
- (c) whether the new rules are in conformity with the Nuclear Liability Act passed by the Government or a dilution of the Act and violation of the spirit of the Act;
- (d) if so, the details and the reasons therefor;
- (e) whether America has opposed some provisions of the said Act; and
- (f) if so, the details thereof;

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) Yes, Sir.
- (b) The Central Government in exercise of powers conferred by Section 48 of the Civil Liability for Nuclear Act, 2010 has notified the Civil Liability for Nuclear Damage Rules, 2011 in the Gazette of India on 11 November 2011, which have been laid before each House of Parliament.
- (c)&(d) Yes, Sir. The Civil Liability for Nuclear Damage Rules, 2011 are in conformity with the Civil Liability for Nuclear Damage Act, 2010.
- (e)&(f) Following the passage of Civil Liability for Nuclear Damage Act, 2010 and before publication of Civil Liability for nuclear Damage Rules, 2011, some potential suppliers, including from US, had raised certain issues mainly relating to application of 'operator's right of recourse' as provided in Section 17 (b) of the 'Act to be in addition to any other law' as provided in Section 46 of the Act.

(<http://www.dae.nic.in/writereaddata/2288-lsus071211.pdf>)

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2256**  
TO BE ANSWERED ON 07.12.2011

### **PERMISSION TO PRIVATE SECTOR**

2256. ADV. A. SAMPATH:

SHRI ADHI SANKAR:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has received any request from the private sector companies to permit them to participate in nuclear power sector; and
- (b) if so, the details thereof?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) Private sector is participating in the nuclear power sector as supplier of equipment and services. Atomic Energy Act, 1962 permits private sector to participate in nuclear power generation as a minority partner. Federation of Indian Chamber of Commerce and Industry (FICCI) in its Working Group Report on Civil Nuclear Energy (2009), inter-alia, suggested certain amendments to the Atomic Energy Act, 1962 to enable private sector participation in nuclear power generation as a majority partner.

(<http://www.dae.nic.in/writereaddata/2256-lsus071211.pdf>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO: 144**  
TO BE ANSWERED ON 01.12.2011

### ACCIDENT OF TRUCK CARRYING NUCLEAR MATERIALS

\*144. SHRI MOINUL HASSAN :

Will the PRIME MINISTER be pleased to state:

- (a) Whether a truck carrying nuclear materials had an accident in Andhra Pradesh;
- (b) If so the details thereof;
- (c) Whether Government is taking any initiative to increase the security escort during transportation of nuclear materials;
- (d) If so, the details thereof and ;
- (e) If not, the reasons therefor ?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PMO (SHRI V. NARAYANASAMY)

(a)to(e) A Statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION  
NO. 144 FOR ANSWER ON 01.12.2011 BY SHRI MOINUL HASSAN REGARDING  
ACCIDENT OF TRUCK CARRYING NUCLEAR MATERIALS

(a) Yes, Sir.

- (b) A container trailer truck carrying nuclear material and going from Uranium Corporation of India Limited (UCIL), a Public Sector Undertaking (PSU) under the Department of Atomic Energy(DAE), Jaduguda, Jharkhand to Nuclear Fuel Complex, a constituent unit under the DAE, Hyderabad, Andhra Pradesh met with a small accident on 24.10.2011 at 0745 hours on the N.H. 16 road near Narasannapet town, Srikakulam district, Andhra Pradesh. The truck was being escorted by two (one at front and one at rear) Central Industrial Security Force(CISF) manned vehicles. The accident occurred when a loaded truck (No.TN 54 Z 3148) traveling in front of the escort vehicle suddenly stopped alongside another stationary truck (No. AP 30 W 3839), which was parked on the roadside. The front escort vehicle narrowly managed to swerve to one side avoiding a serious clash but the loaded container trailer truck traveling behind the escort vehicle in spite of immediately applying the brakes, slowed down but rammed into the rear of truck No. TN 54 Z 3148. The engine of the container trailer truck was damaged without any injury to the driver. There was no impact either on the container in which the uranium peroxide is packed, or on the fuel itself. The nuclear materials on board the truck were intact without any spillage and there was no release of radiation into the atmosphere at the spot of the accident. There was no injury to any person either in the trailer or in the road. The Atomic Energy Regulatory Board which assessed the situation has reported that there is no release of radiation into the atmosphere at the

## **Nuclear and Arms Control Centre**

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spot of the accident. The power unit(cab) of the container truck with the damaged engine was removed and attached to another cab(which was requisitioned) and the container truck left the accident site at 1800 hours on 26.10.2011 for NFC, Hyderabad.

- (c)&(d) Transportation of nuclear materials are being carried out always by providing adequate security by way of CISF escorts in the front and rear of such transportation.
- (e) Does not arise in view of (c) above.

([http://www.dae.nic.in/writereaddata/rssq144\\_011211.pdf](http://www.dae.nic.in/writereaddata/rssq144_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO : 157**  
TO BE ANSWERED ON 01.12.2011

### VIEWS OF FORMER SECRETARY ON SECURITY OF KUDANKULAM PROJECT

\*157. SHRI RAVI SHANKAR PRASAD:

Will the PRIME MINISTER be pleased to state:

- (a) whether attention of Government has been drawn towards views expressed by former Power Secretary regarding security of Kudankulam Atomic Energy Project;
- (b) if so, the facts thereof and whether it is also a fact that the former Power Secretary is a renowned scientist and a seasoned officer;
- (c) if so, the reaction of Government in this context; and
- (d) whether he has expressed his views not only on Kudankulam project but also about other atomic energy projects being unsafe?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a)to(d) A statement is laid on the Table of the House

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION NO.157 FOR ANSWER ON 01.12.2011 BY SHRI RAVI SHANKAR PRASAD REGARDING VIEWS OF FORMER SECRETARY ON SECURITY OF KUDANKULAM PROJECT

(a) Yes, Sir.

(b) Shri E.A.S. Sarma, former Secretary, Ministry of Power has written to the Government to put embargo on nuclear power projects, conduct independent safety audits, review related statutes and revisit the country's energy policy etc.

(c)&(d) The Central Government attaches highest importance for safety in the use of nuclear energy in the country. The task forces / committee set up in Nuclear Power Corporation of India Limited (NPCIL) and Atomic Energy Regulatory Board (AERB), reviewed the safety of all the nuclear power plants in operation and under construction in the context of the Fukushima (Japan) incident and found that Indian nuclear power plants are safe against the extreme natural events. A roadmap has been drawn up to implement the recommendations of the task forces / committee in a time bound manner and implementation has commenced.

([http://www.dae.nic.in/writereaddata/rssq157\\_011211.pdf](http://www.dae.nic.in/writereaddata/rssq157_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1086**  
TO BE ANSWERED ON 01.12.2011

### CONSTRUCTION COST OF KUDANKULAM NUCLEAR PROJECT

1086. SHRI SHIVANAND TIWARI:

SHRI RAVI SHANKAR PRASAD:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that total construction cost of Kudankulam Atomic Energy Project has been estimated at 13,000 crore;
- (b) if not, the actual position and whether more time would be required for completion of this project;
- (c) if so, the total amount of money spent on construction of this project till September, 2011; and
- (d) the names of foreign institutions assisting in construction of this project and the amount of money spent by them respectively on this project?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) The approved completion cost of Kudankulam Nuclear Power Project is 13,171 crore.
- (b) The completion cost is now expected to be 15,824 crore. The project is expected to be completed in 2012-13.
- (c) The total expenditure on the project till September 2011 is 14,122 crore.
- (d) The Kudankulam project is being implemented in technical cooperation with the Russian Federation with shared scope of work. The design and supply of major equipment is in the Russian scope while the construction, installation of equipment, commissioning and some of the supplies / equipments are in Indian scope. The Russian institution involved in setting up of the project is the Russian Atomstroyexport JSC (ASE JSC), a leading Russian engineering company of State Corporation, "Rosatom" on construction of nuclear power facilities abroad. ASE JSC is supplying components, equipment and services, at a cost of 1812 million US Dollars, part of which is covered by Russian Credit to the Government of India.

([http://www.dae.nic.in/writereaddata/rsus1086\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1086_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1087**  
TO BE ANSWERED ON 01.12.2011

### TEN POINT PLAN FOR KUDANKULAM NUCLEAR PROJECT

1087. SHRI RAM JETHMALANI:

SHRI SHIVANAND TIWARI:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that a ten-point plan has been suggested by Former President Dr. A.P.J. Abdul Kalam regarding Kudankulam Nuclear Power Plan for development of nearby areas;
- (b) if so, the facts thereof and the details of ten-point plan;
- (c) whether this ten-point plan is concerned with safety aspect of Kudankulam main nuclear project; and
- (d) if so, Government's reaction thereto?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)&(b) There have been reports in the press and media that the former President, Dr. Kalam has suggested a ten point plan aimed at development of nearby areas covering 50 to 60 villages around the Kudankulam nuclear project and to be implemented before 2015 at an estimated cost of 200 crore.
- (c) No, Sir.
- (d) Does not arise

([http://www.dae.nic.in/writereaddata/rsus1087\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1087_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 1088**  
TO BE ANSWERED ON 01/12/2011

### **SAFETY ASSESSMENT OF TARAPUR NUCLEAR PLANTS**

1088. SHRI RAJEEV CHANDRASEKHAR:

Will the PRIME MINISTER be pleased to state:

- (a) whether Government is conducting any safety assessment exercise for the nuclear plants in Tarapur, which is 40 year old and those in Kota, Madras and Narora, which are around 30 years old; and
- (b) if so, the details thereof?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PMO (SHRI V. NARAYANASAMY):

- (a)&(b) Regular reviews of safety and upgrades of nuclear power plants to bring them to state of the art in terms of safety are an ongoing exercise. Major health assessment, renovation and modernization and safety upgrades have been completed in TAPS 1 & 2 at Tarapur in 2006, RAPS 2 at Rawatbhata in 2009, MAPS 1 & 2 at Kalpakkam in 2006 and NAPS 1 & 2 at Narora in 2010.

In the context of the Fukushima (Japan) incident, safety review of all nuclear power stations have been conducted by the taskforces. The reviews have found that Indian nuclear power reactors are safe and have margins to withstand extreme natural events. They have also made recommendations to further enhance the safety. A roadmap for their implementation has been drawn up and the implementation has commenced.

([http://www.dae.nic.in/writereaddata/rsus1088\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1088_011211.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1089**  
TO BE ANSWERED ON 01.12.2011

### VEHICLE RUNNING ON THORIUM

1089. SHRIMATI GUNDU SUDHARANI:

Will the PRIME MINISTER be pleased to state:

- (a) whether it has come to the notice of the Department that a theory propounded by Laser Power Systems, a US company, to run a vehicle to the tune of four lakh kilometers with eight grams of Thorium;
- (b) whether our country has done any experiments on this;
- (c) if so, the details of the theory;
- (d) whether Cadillac has displayed a Thorium-based concept car about a couple of years ago; and
- (e) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PMO (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) No, Sir.
- (c) Does not arise.
- (d) & (e) A concept design was displayed in Electronic media few years back but technical details are not available.

([http://www.dae.nic.in/writereaddata/rsus1089\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1089_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1090**  
TO BE ANSWERED ON 01.12.2011

### INDO-RUSSIAN NUCLEAR COOPERATION IN ATOMIC ENERGY

1090. SHRI TARUN VIJAY:

Will the PRIME MINISTER be pleased to state:

- (a) the Status of Indo-Russian cooperation in atomic energy;
- (b) whether Russian help to China in the field of nuclear missiles would have an impact on India's security; and
- (c) the position of India's civil nuclear treaty with USA?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PMO (SHRI V. NARAYANASAMY)

- (a) The first Inter-Governmental Agreement between the erstwhile USSR and India was signed in the year 1988 for supply of two Light Water Reactors each of 1000 MW at Kudankulam, Tamilnadu. A supplement to the IGA was signed with the Russian Federation in 1998. The construction of Kudankulam 1 & 2 (2 X 1000 MW) project at Kudankulam, Tamilnadu, has been completed and is at commissioning and start up stage. An IGA for additional nuclear power plant units at Kudankulam and at a site to be identified by Government was signed on 5th December 2008. Further, a broad based IGA between India and Russia on Cooperation in the use of Atomic Energy for Peaceful Purposes was signed on 12th March 2010. Discussions at the level of companies have been held regarding furthering cooperation in nuclear power production. In December 2010, the two countries have also signed an MoU concerning broader scientific and technical cooperation in the field of peaceful uses of atomic energy.
- (b) The Government monitors all developments having a bearing on national security and takes all necessary steps to safeguard it.
- (c) An Inter-Governmental Agreement between India and the USA Concerning Peaceful Uses of Nuclear Energy was signed on 10th October 2008 and came into force on 6th December 2008. Arrangements and Procedures pursuant to Article 6(iii) of the Agreement were concluded on 30th July 2010. Discussions at the level of companies have been held regarding nuclear power projects to be set up in India in technical cooperation with the US.

([http://www.dae.nic.in/writereaddata/rsus1090\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1090_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1091**  
TO BE ANSWERED ON 01.12.2011

### ACHIEVEMENT OF OBJECTIVES OF ATOMIC ENERGY

1091. SHRI RAM KRIPAL YADAV:

Will the PRIME MINISTER be pleased to state:

- (a) the development and status to achieve the objective of Atomic Energy Act, 2008 so far;
- (b) the main features of this Atomic Energy Act, 2008; and
- (c) the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PMO (SHRI V. NARAYANASAMY)

(a)to(c) There is no Act called 'Atomic Energy Act, 2008' enacted by the Government. However, the Atomic Energy Act, originally enacted in 1948, was repealed in 1962 when the Atomic Energy Act, 1962 was enacted. Minor amendments to the Act were made in 1986 and 1987. The Department of Atomic Energy reviewed the need for amending the provisions of the Act, and action taken thereon from time to time since the beginning of the 1990's. The Department of Atomic Energy is now in the process of finalizing draft amendments to be made to the Atomic Energy Act, 1962. Atomic Energy Act, 1962 essentially provides the legal framework for development, control and use of atomic energy for the welfare of people of India and for other peaceful purposes and for matters connected therewith. The benefits availed under Atomic Energy Act, 1962 so far are as follows: -

1. indigenous development of nuclear power technology and nuclear fuel cycle technology.
2. Large scale application of radioisotopes in a. Healthcare i.e. diagnosis, therapy and sterilization.
  - b. Nuclear agriculture: Use of radioisotopes for mutation of seeds (largely oil seeds and pulses) for improvement in yield, resistance against pest and shortening of maturity period, etc.
  - c. Application of radioisotope for food preservation.
  - d. Industrial applications: non-destructive testing using gamma rays, gamma scanning of petro-chemical towers, logging of oil wells, radiation processing of polymers, industrial gauging, etc.
3. Capacity building for strategic activities.

([http://www.dae.nic.in/writereaddata/rsus1091\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1091_011211.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1092**  
TO BE ANSWERED ON 01.12.2011

### SETTING UP OF NEW ATOMIC PLANTS

1092. SHRI NAND KUMAR SAI:

Will the PRIME MINISTER be pleased to state:

- whether Government has decided to set up new Atomic Power Plants in the country during the Eleventh Five Year Plan period;
- if so, the details in this regard;
- the details of the funds allocated and expenditure incurred in setting up of various such plants during the current plan period; and
- the details of the progress so far made in each of such plants alongwith the time by which each of such plants would be completed?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a)&(b) During the XI Plan period, a capacity of 880 MW with commissioning of 2 units of Kaiga 3&4 (2 x 220 MW) at Kaiga in Karnataka and 2 units of RAPP 5&6 (2 x 220 MW) at Rawatbhata in Rajasthan have been added. Two nuclear power reactors at Kudankulam, KKNPP-1&2 (2 x 1000 MW) and a Proto Type Fast Breeder Reactor (PFBR) of 500 MW at Kalpakkam both in Tamilnadu have reached advanced stage of construction during the XI Plan period. Two new projects, with a total capacity of 2800 MW, viz. KAPP 3&4 (2 x 700 MW) at Kakrapar and RAPP 7&8 (2 x 700 MW) at Rawatbhata have already been launched during the XI Plan period, in November 2010 and July 2011 respectively.

(c)&(d) The details of funds allocated, expected expenditure and expected completion schedule of these projects are as under:

Project	Location	Capacity (MW)	XI Plan (MTA) (Rs. Crore)	Expected Expenditure in XI Plan (Rs. Crore)	Expected Completion
Kaiga-3&4	Kaiga, Karnataka	2 x 220	759	659	Completed
RAPP-5&6	Rawatbhata, Rajasthan	2 x 220	570	554	completed
KKNPP- 1&2	Kudankulam, Tamilnadu	2 x 1000	3735	5345	2012-13
PFBR	Kalpakkam. Tamilnadu	500	4817	4038	2014-15
KAPP-3&4	Kakrapar, Gujarat	2 x 700	1801	1820	2015-16
RAPP-7&8	Rawatbhata, Rajasthan	2 x 700	776	1316	2016-17

([http://www.dae.nic.in/writereaddata/rsus1092\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1092_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1093**  
TO BE ANSWERED ON 01.12.2011

### COMPLETION OF KUDANKULAM POWER PROJECT

1093. SHRI N. BALAGANGA:

Will the PRIME MINISTER be pleased to state:

- (a) whether Kudankulam power project has been completed;
- (b) if so, the details thereof and if not the likely time by which it would be completed;
- (c) whether there has been any difficulty in its completion because safety aspects have not been taken care of;
- (d) if so, the details thereof; and
- (e) the action taken by Government thereto?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)&(b) Construction of Units 1&2 of Kudankulam Nuclear Power Project is on the verge of being completed. Units 1&2 are expected to be commissioned in the year 2012 -13. A cumulative progress of 99.2% of Unit-1 and 94.6% of Unit-2 has been achieved.
- (c) No, Sir. The Kudankulam nuclear reactors have been licensed by the Russian Regulatory Authority in Russia and the Atomic Energy Regulatory Board in India and meet all the safety requirements. These nuclear power reactors employ the advanced and state of art safety systems.

(d)&(e) Do not arise.

([http://www.dae.nic.in/writereaddata/rsus1093\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1093_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1094**  
TO BE ANSWERED ON 01.12.2011

### AERB GUIDELINES FOR POPULATION AROUND NUCLEAR PLANTS

1094. SHRI P. RAJEEVE:

Will the PRIME MINISTER be pleased to state:

- (a) the Atomic Energy Regulatory Board (AERB) guidelines for population distribution within the sterilized zone around a nuclear power plant;
- (b) whether Kudankulam and Idinthakarai lie within the sterilized zone of the Kudankulam Nuclear Power Plant and the number of their respective population; and
- (c) the details of an emergency evacuation plan, if any, for the population falling within the sterilized zone of the Kudankulam nuclear plant?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PMO (SHRI V. NARAYANASAMY)

(a) AERB code 'Code of practice on safety in nuclear power plant siting', provides three desirable parameters for ready acceptance of the site.

1. Population within sterilised zone (5km radius) : less than 20000
2. Distance of population centres (>10000 person) : More than 10km
3. Distance of large population centers (>100000 person) : More than 30 km

These data are desirable for plain terrain. Site shall be considered as acceptable if implementation of emergency measures under accident conditions can be ensured for the entire population. Offsite emergency response plan prepared should demonstrate adequate capability to handle such situations.

- (b) The population in the sterilized zone of Kudankulam site at the time of site selection was 15042. Kudankulam and Idinthakarai villages fall within the sterilized zone of the Kudankulam nuclear power plant. As per the 2001 census the population in Kudankulam and Idinthakarai villages was 9063 and 3996 respectively.
- (c) A detailed emergency preparedness plan for an area 16 km around the plant termed emergency planning zone, which also includes the sterilized zone, is put in place before the start of operation of the plant. This emergency preparedness plan is made available to the District Magistrate of the area.

([http://www.dae.nic.in/writereaddata/rsus1094\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1094_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1095**  
TO BE ANSWERED ON 01.12.2011

### DECLINE IN ATOMIC ENERGY DUE TO FUKUSHIMA DISASTER

1095. SHRI RAVI SHANKAR PRASAD:  
SHRI RAMCHANDRA PRASAD SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that after mishap in Atomic Energy Project in Fukushima, Japan, it is being assessed that production of power would decrease by 15 per cent in atomic energy area at international level;
- (b) if so, the facts thereof; and
- (c) whether Government would reconsider on increasing the expansion of atomic energy after study of this assessment?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)&(b) Following the Fukushima incident, only three countries Germany, Switzerland and Taiwan have announced plans to gradually phase out nuclear power on a long term perspective. These decisions are country specific, depending on their energy demand, availability of resources, possibility & capability of importing power depend on fuel and other local domestic compulsions. In contrast, many countries like Iran, China, Pakistan have added new capacity to the grid and many countries have announced launching of new nuclear power projects, some of them being new entrants to nuclear power. The position of nuclear power generation is not likely to be affected significantly over the long term by these decisions.
- Many agencies like International Energy Agency (IEA), World Nuclear Association (WNA), International Atomic Energy Agency (IAEA) etc. routinely conduct studies on future energy outlook. The IEA in its publication World Energy Outlook 2011, released in November 2011 has brought out two scenarios in respect of nuclear power outlook. In the "New Policies" scenario it projects a rise in nuclear output by more than 70% over the period to 2035. In its "low nuclear case" scenario, which considers a pessimistic view of the prospects for the nuclear power post Fukushima incident, it projects a drop of 15% in nuclear power by the year 2035.
- (c) India's energy resources are limited and the demand of energy / electricity is huge and rapidly growing. This requires that all sources of electricity generation need to be deployed optimally, including nuclear power. Nuclear energy is a clean energy option that does not release green house gases and is thus environment friendly. It can provide long term energy security to the country. It will, therefore, be pursued, with full regard to the safety, security and livelihood of the people.

([http://www.dae.nic.in/writereaddata/rsus1095\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1095_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1096**  
TO BE ANSWERED ON 01.12.2011

### "CATCH THEM YOUNG" PROGRAMME OF DEPARTMENT

1096. SHRIMATI VASANTHI STANLEY:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Research unit of the Department have a 'Catch Them Young' programme or any such programme to attract the students with potential in the field of atomic energy;
- (b) if so, the details thereof;
- (c) if not, the reasons therefor; and
- (d) in what manner, Government would engage with younger scientists and Non-Governmental persons in developing advanced technology?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PMO (SHRI V. NARAYANASAMY)

(a) Yes, Sir.

(b) There are several schemes operational to attract the students with potential to work in the field of atomic energy. The following are the entry channels available for the recruitment of young talented students to join the R&D units for taking up research careers in the field of atomic energy:

- (i) Orientation Course in Engineering & Sciences (OCES).
- (ii) DAE Graduate Fellowship Scheme (DGFS).
- (iii) Dr. K.S. Krishnan Research Associate Scheme (KSKRAS).
- (iv) Tie-up with Mumbai University to establish DAE – Mumbai University Centre for Excellence in Basic Sciences (DAE-MU-CBS).
- (v) National Institute for Science Education and Research (NISER) in Bhubaneswar.

(c) Not applicable.

(d) Fresh young science and engineering students undergo one year training in Bhabha Atomic Research Centre Training School and are recruited as Scientific Officers in DAE thereafter. After joining the Department, they are allowed to continue to do project work for fulfilling the requirements for the award of M.Tech. degree of Homi Bhabha National Institute (HBNI), a deemed to be university. The DAE Graduate Fellowship Scheme (DGFS) also provides fellowship to engineering graduates who have secured admission to M.Tech. programme to study in IIT/IISc. / other select premier engineering institutes. DGFS fellows are subsequently recruited as Scientific Officers in DAE.

Similarly doctoral students are selected as KSKRA fellows who, after completion of one year of fellowship, are considered for absorption in DAE as Scientific Officers. All the Scientific Officers joining BARC are required to work on topics related to departmental programme on nuclear science and technology and thus contribute towards development of advanced technologies.





## **Nuclear and Arms Control Centre**

The five year integrated M.Sc. programme conducted by the DAE-MU-CBS in Mumbai and National Institute for Science, Education and Research (NISER) in Bhubaneswar, offers academic programme which are useful in nurturing the students and provide them exposure to the DAE research facilities and programmes. These students are given opportunity to work on the advanced areas in nuclear science and technology and thus also contribute for the development of advanced technologies.

([http://www.dae.nic.in/writereaddata/rsus1096\\_011211.pdf](http://www.dae.nic.in/writereaddata/rsus1096_011211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.1381**  
TO BE ANSWERED ON 30.11.2011

### NEUTRINO RESEARCH CENTRE

1381. SHRI K.P. DHANAPALAN:

Will the PRIME MINISTER be pleased to state:

- (a) the present status of the proposed Neutrino Research Centre at Theny, Tamil Nadu;
- (b) whether there has been any environmental concerns regarding the setting up of the said Centre; and
- (c) if so, the details thereof and the measures taken by the Government in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) The India based Neutrino Observatory (INO) Project is proposed to be set up at Bodi West Hills in Pottipuram village, Theni District, Tamilnadu. The Government of Tamilnadu has provided land for setting up of this underground laboratory and the action is on hand to take possession of land.
- (b)&(c) There are no environmental concerns since INO is a laboratory for basic sciences. There will be no emission of any toxic substances, no radioactivity or any other hazardous substances. The laboratory is not going to be set up in any forest land and will be situated well away from wild life sanctuaries. The Ministry of Environment and Forests, Government of India has given environmental clearance and the forest clearance has also been granted to the project by the Government of Tamilnadu.

([http://www.dae.nic.in/writereaddata/lsus1381\\_301111.pdf](http://www.dae.nic.in/writereaddata/lsus1381_301111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1435**  
TO BE ANSWERED ON 30.11.2011

### MOBILE RADIATION DETECTION SYSTEM

1435. SHRI NITYANANDA PRADHAN:

SHRI BAIJAYANT JAY PANDA:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has installed or proposes to install mobile radiation detection system and special radiation detection vehicles in various cities of the country; and
- (b) if so, the details thereof and the aims and objectives of the same?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) Yes, sir.

- (b) The Government has proposed to equip 800 police stations covering 80 cities of India with radiation monitors including mobile radiation detection system that can be fitted to Police Control Room (PCR) vans of the police. This will facilitate police to detect and get alerted in case such a van approaches any radioactive source or a radiologically contaminated area or detects any radioactive source being transported.

Further, Department of Atomic Energy has established 20 Emergency Response Centres equipped with radiation monitors and protective gear for Emergency Response Teams and having capability of mobile radiological monitoring through trained Emergency Response Teams.

([http://www.dae.nic.in/writereaddata/lus1435\\_301111.pdf](http://www.dae.nic.in/writereaddata/lus1435_301111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1442**  
TO BE ANSWERED ON 30.11.2011

### VODO-VODYANOI-ENERGETICHESKY REACTORS

1442. SHRI UDYAN RAJE BHONSLE:

Will the PRIME MINISTER be pleased to state:

- (a) whether two Vodo-Vodyanoi-Energetichesky Reactors (VVERs) have been purchased from Russia for installing in Kudankulam Power Plant;
- (b) if so, the details thereof including the date of purchase and their cost;
- (c) whether the technology used in VVE reactors comply with the safety norms adopted in western countries; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) Two VVERs each of 1000 MW capacity, are being set up at Kudankulam in Tamilnadu in technical cooperation with Russian Federation.
- (b) While the design and supply of major equipment are in the Russian scope, construction, commissioning and some of the supplies are in Indian scope. The final agreement in this regard was signed on July 24, 2001.
- (c)& (d) As per our policy, any reactors to be set up in the country with foreign technical cooperation should meet the safety norms prescribed by the regulatory authorities in the country of origin and the Atomic Energy Regulatory Board (AERB) in India. The VVERs meet both the Russian and Indian regulatory requirements on safety.

([http://www.dae.nic.in/writereaddata/lsus1442\\_301111.pdf](http://www.dae.nic.in/writereaddata/lsus1442_301111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1469**  
TO BE ANSWERED ON 30.11.2011

### **BHOPAL MEMORIAL HOSPITAL**

1469. SHRI P.T. THOMAS:

Will the PRIME MINISTER be pleased to state:

- (a) the present status of takeover of Bhopal Memorial Hospital by the department of Atomic Energy;
- (b) whether there has been a delay in the process;
- (c) if so, the details thereof and the reasons therefor; and
- (d) the action taken/proposed to be taken by the Government in this regard?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) Consequent to the decision of the Union Cabinet, the Department of Atomic Energy (DAE) and the Department of Bio-technology (DBT) have provisionally taken over the Bhopal Memorial Hospital & Research Centre (BMHRC) on 02.08.2010, pending constitution of an appropriate administrative structure for the hospital in the nature of an autonomous society etc. A Government Resolution was issued in this regard on 03.09.2010. The day to day administration of the hospital is being attended to by the DAE and the requisite budgetary grants for salaries, drugs and consumables, maintenance etc., are being released by the Department. When the matter of constitution of an autonomous society for the management of the BMHRC and related matters such as approval for seeking the sanction of the Ministry of Finance in respect of the posts existing in the hospital, etc., were placed before the Atomic Energy Commission (AEC), the AEC felt that managing a hospital like BMHRC, does not form part of the mandate of the DAE and that there would be several operational difficulties in running a large hospital. The Commission therefore advised the DAE to take up the issue with the Cabinet Secretary for transfer of the administration of the BMHRC to any other appropriate department in the Government of India. The Committee of Secretaries met and deliberated on this issue and recommended that the administration of the BMHRC be transferred to Department of Health Research, Ministry of Health and Family Welfare. Accordingly the matter is being placed for the approval of the Union Cabinet.

- (b) No, Sir.
- (c) Not applicable;
- (d) As mentioned at (a) above.

([http://www.dae.nic.in/writereaddata/lsus1469\\_301111.pdf](http://www.dae.nic.in/writereaddata/lsus1469_301111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1486**  
TO BE ANSWERED ON 30.11.2011

### RADIOACTIVITY

1486. SHRI BHUDEO CHOUDHARY:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has commissioned/proposes to commission the work of automatic shutdown of nuclear power plants;
- (b) if so, the details thereof and the time by which the work is likely to be completed;
- (c) if not, the reasons therefor;
- (d) the details of the centres set up for imparting training for the safety of nuclear plants and prevention of nuclear leakage; and
- (e) the steps taken to contain the effect of the radioactive pollution in sea water and to reduce the ill effects on health?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)to(c) All the Indian Nuclear Power Plants in India have built-in design provisions for automatic shutdown system. These automatic shutdown systems are fail safe which ensure shutdown of the Nuclear Power Reactors within two seconds. The task forces / committee set up in Nuclear Power Corporation of India Limited (NPCIL) and Atomic Energy Regulatory Board (AERB) reviewed the safety of all Nuclear Power Plants (NPPs) in operation and construction in the country in the context of the Fukushima (Japan) incident and found that Indian Nuclear Power Plants are safe against the extreme natural events. One of the recommendations of the task forces / committee was to install systems for initiation of automatic shutdown on sensing seismic activity. Such systems are already in place in respect of Kakrapar Atomic Power Station and Narora Atomic Power Station. A roadmap for installation of the system in remaining Nuclear Power Plants has been prepared for implementation in a time bound manner.
- (d) Nuclear Training Centres, fully equipped with latest training aids and state-of-art simulators are functioning at nuclear power plant sites to train personnel on all aspects of safety and operation of nuclear power plants. These centres provide both initial plant systems specific training and continual training for enhanced performance. At the training centres simulators have been installed for hands on training for skill development of operating personnel in handling all types of situations that could possibly arise in the nuclear power plants both during normal operation and in emergencies. The operating personnel are licensed by AERB, after completion of a detailed training, passing of written examination, completion of checklists, and interviews, before they are licensed and authorized to operate nuclear power plants. Re-licensing of the operating personnel is done at stipulated intervals as per AERB guidelines. In addition, the BARC training school also trains engineers in nuclear science and engineering. Homi Bhabha National Institute (HBNI), a deemed university has also been established for higher studies in nuclear science and engineering.

## Nuclear and Arms Control Centre

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- (e) The increase in radiation due to operation of nuclear power plants are a fraction of existing natural radiation at each of the nuclear power plant site and are well within the limits set by the AERB. Monitoring of radioactivity in the neighborhood of nuclear power plants and radiological survey of nearby water bodies (coastal or in land), ground water, food chain including milk, animal products, fruits, vegetables, sea food and fish are performed by Environmental Survey Laboratories to ensure that radioactivity level does not exceed limits stipulated by AERB.

([http://www.dae.nic.in/writereaddata/lsus1486\\_301111.pdf](http://www.dae.nic.in/writereaddata/lsus1486_301111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1531**  
TO BE ANSWERED ON 30.11.2011

### MINING OF MONAZITE

1531. SHRI KODIKKUNNIL SURESH:

SHRI D.B. CHANDRE GOWDA:

Will the PRIME MINISTER be pleased to state:

- (a) the quantum of monazite being exported to other countries;
- (b) whether some of our beaches from where sand is exported to other countries contain monazite and thorium;
- (c) if so, the details thereof;
- (d) whether the companies which have been given the contract for mining beach sand do not have the technical know-how to separate thorium from monazite;
- (e) if so, the details thereof;
- (f) whether the companies mining beach sand have violated the norms of Atomic Energy Regulatory Board (AERB) in regard to setting up of mineral separations plants; and
- (g) if so, the details thereof and the corrective steps taken/proposed to be taken by the Government in this regard?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Monazite is being exported only by Indian Rare Earth Limited (IREL), a public sector undertaking under the Department of Atomic Energy. The quantum of monazite exported by IREL in the last three years are given below:

Year	Quantity (tonnes)
2010-11	5
2009-10	2
2008-09	5

(b) Beach sands contain heavy minerals such as ilmenite, rutile, leucoxene, garnet, sillimanite, zircon and monazite (which is radioactive and a source of thorium). Ilmenite, rutile, leucoxene, garnet, sillimanite and zircon are separated from beach sands and these individual heavy minerals free of monazite are being exported. As per the latest notification of Department of Atomic Energy vide ref. S.O.61(E) dated January 20, 2006, these heavy minerals are delisted from the prescribed substances list and hence for the handling of these minerals licence from Department of Atomic Energy under the Atomic Energy (Working of the Mines, Minerals and Handling of Prescribed Substance) Rules, 1984 is not required. However, licence under the Atomic Energy Act is still required for handling / export of monazite and Thorium, which are prescribed substances. This Department has not given any licences for export of beach sand as such.

(c) Answered in (b) above.



## Nuclear and Arms Control Centre

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(d) Consequent to de-listing of ilmenite, Rutile, Zircon etc. from the list of prescribed substances, no licences or permission are required from DAE for these substances. However, under the guidelines framed by the Atomic Energy Regulatory Board (AERB) individual processors of beach sand have to separate and safely keep the monazite content of such sand. No individual or entity is permitted to process monazite in any manner without a licence from DAE. Further no licences have been given to any private party to process monazite and separate thorium.

(e) Same as (d) above

(f) No, Sir.

(g) Not applicable.

([http://www.dae.nic.in/writereaddata/lsus1531\\_301111.pdf](http://www.dae.nic.in/writereaddata/lsus1531_301111.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1542**  
TO BE ANSWERED ON 30.11.2011

### URANIUM RESERVES

1542. SHRI HARI MANJHI:

SHRI L. RAJA GOPAL:

Will the PRIME MINISTER be pleased to state:

- the quantum of uranium exported by India to other countries during each of the last three years and the current year, country-wise and variety-wise;
- the quantum of uranium imported from other countries during the above period, country-wise and variety-wise;
- whether Tummalapalle uranium mines recently discovered have the world's largest uranium reserves;
- if so, the details thereof; and
- the manner in which the discovery at Tummalapalle is likely to make India self-sufficient in uranium alongwith the details of power likely to be generated by using the uranium?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- No exports of Uranium have taken place during the said period.
- The quantity of Uranium imported during the period is as follows:

Supplier and Country	Quantity received as on date ( in Metric Tonnes)	Type of Uranium imported
M/s AREVA, France	300	Natural Uranium Ore Concentrate
M/s TVEL Corporation, Russia	567	Natural Uranium Di-oxide Pellets
	58	Enriched Uranium Di-oxide Pellets
M/s NAC Kazatomprom, Kazakhstan	600	Natural Uranium Ore Concentrate

- &(d) No, Sir. The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of the Department of Atomic Energy, has so far established the presence of 63,269 tonnes of Uranium resources (U<sub>3</sub>O<sub>8</sub>) in Tummalapalle area, Kadappa District, Andhra Pradesh.
- The indigenous Uranium will help India to increase nuclear installed capacity, thereby, providing more electricity for economic growth of the country. Uranium reserves already established at Tummalapalle can generate above 2,50,000 MWe – year of electricity.

([http://www.dae.nic.in/writereaddata/lsus1542\\_301111.pdf](http://www.dae.nic.in/writereaddata/lsus1542_301111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1579**  
TO BE ANSWERED ON 30.11.2011

### SAFETY OF NUCLEAR POWER PLANTS

1579. SHRI DUSHYANT SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether a report titled "Safety Evaluation of Indian Nuclear Power Plants Post Fukushima" suggesting safety measures has been prepared;
- (b) if so, the salient features of the said report; and
- (c) the steps taken/proposed to be taken by the Government on the suggestions of the report?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) A report titled "Safety Evaluation of Indian Nuclear Power Plants Post Fukushima Accident" containing the safety review of Indian nuclear power plants has been prepared by the task forces constituted by Nuclear Power Corporation of India Limited (NPCIL). The report has been made public and put on websites of NPCIL and DAE.
- (b) The review has found that Indian reactors are safe and have adequate margins and features in design to withstand extreme natural events. The report has made recommendations on measures to be taken at different Indian nuclear power reactors to further enhance the safety against extreme natural events like that witnessed at Fukushima.
- (c) A roadmap for implementation of the recommendations has been drawn up and the implementation process has commenced.

([http://www.dae.nic.in/writereaddata/lsus1579\\_30111.pdf](http://www.dae.nic.in/writereaddata/lsus1579_30111.pdf))

## **Nuclear and Arms Control Centre**

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**Ministry of External Affairs**  
**LOK SABHA**  
UNSTARRED QUESTION NO.1592  
TO BE ANSWERED ON 30.11.2011

### **NUCLEAR SMUGGLING BY PAKISTAN**

†1592. SHRI JAI PRAKASH AGARWAL:

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether Pakistan has been involved in smuggling nuclear industry goods from other countries;
- (b) if so, whether the Government has raised/proposes to raise the issue at International fora; and
- (c) if so, the details thereof?

#### **ANSWER**

THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SMT. PRENEET KAUR)

**GOVERNMENT HAS SEEN REPORTS ABOUT TRANSFER OF PAKISTANI NUCLEAR ITEMS.**

**(B) & (C) GOVERNMENT HAS HIGHLIGHTED THE ROLE OF CLANDESTINE  
PROLIFERATION ACTIVITIES IN INTERNATIONAL FORA FROM TIME TO TIME.**

(<http://meaindia.nic.in/mystart.php?id=100518632>)

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO : 42**  
TO BE ANSWERED ON 24/11/2011

### **OPPOSITION TO SETTING UP OF NUCLEAR PROJECT AT JAITAPUR**

\* 42 SHRI D. RAJA:

SHRI R.C. SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) Whether it is a fact that the people of Jaitapur and the surrounding areas in Ratnagiri district have been struggling against the setting up of the giant nuclear project at Jaitapur;
- (b) Whether it is a fact that the French Areva EPR reactors, with which this plant is being set up, are prohibitively expensive and the technology is untried and untested anywhere in the world, not even in France; and
- (c) If the answer to part (a) and (b) be in positive, the details thereof and Government's reaction thereto?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a) to (c) A statement is laid on the Table of the House.

STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION  
NO.42 FOR ANSWER ON 24.11.11 BY SHRI D. RAJA AND SHRI R.C. SINGH  
REGARDING OPPOSITION TO SETTING UP OF NUCLEAR POWER PROJECT AT  
JAITAPUR

- (a) A section of people at Jaitapur and surrounding areas has been opposing setting up of the project.
- (b) The nuclear reactors planned to be set up at Jaitapur are the Evolutionary Pressurised Water reactors (EPRs). The EPR design has been based on the proven design, safety principles and manufacturing technologies employed in "N4" reactors in France and "KONVOI" reactors in operation in Germany. These are under successful and safe operation for the last many years. The EPRs planned at Jaitapur incorporate the operational feedback from "N4" and "KONVOI" reactors. Currently, EPRs are under construction in Finland, France and China. These will be operational in 2 to 4 years. The operational experience from these reactors will also be available before the commissioning of Jaitapur nuclear power project. Discussions between NPCIL and AREVA are at an advanced stage to arrive at a viable tariff regime, comparable to that of other electricity generating plants in the region.

## **Nuclear and Arms Control Centre**

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- (c) The Atomic Energy Commission (AEC) deputed an expert Committee for assessing the technology and safety aspects of EPRs. The Committee carefully examined these issues and visited the plants under construction in Finland and France. The Committee also had discussions with regulatory authorities in Finland and France. The Committee's report has clarified all doubts regarding safety and efficiency of the EPRs.

([http://www.dae.nic.in/writereaddata/rssq42\\_241111.pdf](http://www.dae.nic.in/writereaddata/rssq42_241111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 311**  
TO BE ANSWERED ON 24/11/2011

### DAMAGE TO KUDANKULAM NUCLEAR POWER PROJECT

311. SHRI BAISHNAB PARIDA :

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that there is a serious concern about the damage to the Kudankulam Nuclear Power Project with blockades creating a major impediment in ensuring that the plant systems functioned at a minimal level;
- (b) whether it is a fact that local sentiments are being exploited by environmentalists from Finland, Australia, France and the United States; and
- (c) if so, the concrete steps Government is taking to allay the fears of the villagers of the Kudankulam?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Recently there have been protests against the starting of Kudankulam nuclear power project by sections of the local people which have hampered normal work at the site. Kudankulam Nuclear Power Plants (KKNPP) Units 1&2 are at advanced stage of commissioning. Several reactor and auxiliary systems have been made functional. These systems, which also include sophisticated computer based systems, require certain minimum maintenance to keep them in a healthy state. Efforts are underway, in consultation with the district authorities, to ensure that personnel required for carrying out the minimum maintenance activities are able to go to the plant and carry out the necessary activities smoothly.
- (b) There have been reports in the press to this effect.
- (c) The Government has taken several steps to allay the fears of the local villagers about the project . These include; • Several high level meetings with the state government officials and representative of the local people.
  - Constitution of an Expert Group of 15 specialists, comprising renowned academicians, scientists, doctors and engineers to interact with the officials of the state government and spokespersons of the people in the neighbourhood of Kudankulam. The expert group has already had two meetings with the spokespersons of the local people and the nominees of the Government of Tamilnadu.

## **Nuclear and Arms Control Centre**

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- Directives to Department of Atomic Energy (DAE) and Nuclear Power Corporation of India Limited (NPCIL) to enhance public awareness and outreach programmes in the area around the plant to allay their fears which are being implemented.

([http://www.dae.nic.in/writereaddata/rsus311\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus311_241111.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 312**  
TO BE ANSWERED ON 24/11/2011

### AGITATION AGAINST NUCLEAR PROJECTS

312. SHRI K.N. BALAGOPAL:

Will the PRIME MINISTER be pleased to state:

- (a) Whether Government have noticed the massive agitation by people against Kudankulam and other nuclear projects in the country;
- (b) if so, the steps that were taken to address their demands;
- (c) whether India would re-look into the Nuclear Power policy in the backdrop of recent incidents in Japan?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY

- (a) There have been agitations against nuclear power projects by some sections of people at Kudankulam and Jaitapur.
- (b) In respect of Kudankulam, the Government has constituted an expert group of 15 specialists for interacting with officials of the state government of Tamilnadu and people in the neighbourhood of Kudankulam project. The expert group had two meetings so far to explain the factual position on various aspects of the project and dispel apprehensions of sections of the local people. The opposition to nuclear power projects is largely due to apprehensions about safety of the nuclear power reactor and effect on their livelihood. Issues related to rehabilitation are also a major factor at Jaitapur. Public Communication and outreach activities have been intensified to allay the fears about safety of nuclear power and fears of loss of livelihood. The rehabilitation issues at Jaitapur including additional compensation for land are being addressed in consultation with the state government.
- (c) Twenty nuclear power reactors are in operation for last 40 years, logging 350 reactor years of operation. They have maintained highest level of safety. Our safety records are impeccable. The review of safety of Indian nuclear power reactors by the task forces constituted by NPCIL and high level committee by AERB post Fukushima incident have found that Indian nuclear power reactors are safe and have margins and features in design to withstand extreme natural events. These safety reviews have been made available in public domain on NPCIL and AERB websites respectively. A road map for implementation of the recommendations arising out of the reviews to further enhance the safety has been drawn up and the implementation commenced in a time bound manner. India's energy resources are limited and its demand huge and rapidly growing. This requires all sources of electricity generation to be deployed optimally. Nuclear energy is a clean energy option that can enhance our energy security. It will therefore be pursued, with full regard to the safety, environment and livelihood of the people.

([http://www.dae.nic.in/writereaddata/rsus312\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus312_241111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 313**  
TO BE ANSWERED ON 24/11/2011

### EXPERT COMMITTEE ON KUDANKULAM NUCLEAR PLANTS

313 SHRI MOINUL HASSAN

Will the PRIME MINISTER be pleased to state:

- (a) Whether Government has set up an expert committee for the Kudankulam nuclear power plant project;
- (b) if so, the details thereof; and
- (c) the timeline being followed by the committee to achieve it's objectives?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) The Government has constituted an expert group of 15 specialists for interacting with officials of the state government of Tamilnadu and spokespersons of the people in the neighbourhood of Kudankulam project. The expert group comprises renowned academicians, scientists, doctors and engineers specialized in areas of environmental science, radiation safety, nuclear reactor design, safety and regulatory aspects of nuclear reactors, nuclear waste management, oncology, oceanography, fisheries, thermal ecology, seismology etc. The expert group will explain the factual position on various safety aspects of the project to dispel apprehensions of sections of the local people.
- (c) The committee has already had two meetings with the spokespersons of the local people and State Government officials on November 8 and 18, 2011 at Tirunelveli.

([http://www.dae.nic.in/writereaddata/rsus313\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus313_241111.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 314**  
TO BE ANSWERED ON 24/11/2011

### **NPCIL'S JOINT VENTURE WITH ONGC**

314 SHRI MOINUL HASSAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether NPCIL has entered into a joint venture with ONGC; and
- (b) if so, the details thereof and reasons therefore?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Nuclear Power Corporation of India Limited (NPCIL) has not entered into any joint venture with Oil and Natural Gas Corporation Limited (ONGC) so far. However, discussions in this regard between NPCIL and ONGC are in progress.
- (b) The Joint Venture between NPCIL and ONGC is intended for setting up of nuclear power projects in future.

([http://www.dae.nic.in/writereaddata/rsus314\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus314_241111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 315**  
TO BE ANSWERED ON 24/11/2011

### **PUBLIC OPPOSITION TO NUCLEAR PLANTS**

315 SHRI TARUN VIJAY:

Will the PRIME MINISTER be pleased to state:

- (a) the status of Nuclear power Plants facing public opposition in Maharashtra and Tamil Nadu;
- (b) the investment that has already been made in both plants under construction; and
- (c) whether Government is still determined to go ahead with plans in both places?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Sections of local population are opposing the setting up of nuclear power project at Jaitapur in Maharashtra and construction, commissioning and operation of Kudankulam Nuclear Power Plants (KKNPP) in Tamilnadu.

At Jaitapur, land has been acquired, Environmental and Coastal regulatory Zone clearances have been obtained and site infrastructure works taken up. The detailed techno-commercial offer of Areva, France is under the consideration Nuclear Power Corporation of India Limited (NPCIL). Administrative and Financial sanction for implementation of project will follow thereafter. KKNPP Unit-1 is at an advanced stage of commissioning with its 'hot run' having been completed. KKNPP Unit – 2 is also closely following the first unit.

- (b) The cumulative expenditure upto September 2011 has been Rs. 14122 crore on Kudankulam project (KKNPP Units 1 & 2). The expenditure on Jaitapur nuclear power project upto September 2011 has been Rs. 46 crore.

(c) 20 nuclear power reactors are in operation for last 40 years, marking 350 reactor years of operation. They have maintained highest level of safety. Our safety records are impeccable. The safety of Indian nuclear power plants have been reviewed and they have been found to be having adequate margins and features in design to withstand extreme natural events. Further, India's energy resources are limited and its demand huge and rapidly growing, which requires, that all sources of electricity generation need to be deployed optimally. Nuclear energy is a clean energy option that can not only enhance our energy security in the future but also reduce CO2 emission which is essential for preventing climate change. Nuclear programme which will be pursued with full regard to safety, environment and livelihood of the people living in the neighborhood of the reactors.

([http://www.dae.nic.in/writereaddata/rsus315\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus315_241111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 316**  
TO BE ANSWERED ON 24/11/2011

### AGITATION AGAINST ATOMIC PLANTS WITH FOREIGN ASSISTANCE

316. SHRI MOHAN SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Prime Minister is aware that the reasons for growing public agitation against all atomic power generation plants being built in Tamilnadu, Maharashtra, West Bengal etc. with foreign assistance are security related concerns;
- (b) if so, the steps being taken to allay those concerns; and
- (c) whether the local people are being satisfied by those steps?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The project at Kudankulam in Tamilnadu is being set up in technical cooperation with the Russian Federation. The project construction started in 2002 and has reached the commissioning stage. While there was no opposition to the project all along, during the "hot run" and testing of systems, noise from steam discharge created fears amongst the local people. This was compounded by an emergency preparedness drill at the site and neighbouring areas to meet regulatory requirement before commissioning. These fears were heightened in view of the Fukushima incident. The fears were fuelled further by misinformation spread by anti nuke activists. At Jaitapur in Maharashtra land has been acquired, environmental clearances obtained and site infrastructure works are in progress and project construction is yet to start. The opposition to nuclear power projects at Jaitapur in Maharashtra is largely due to issues related to rehabilitation, apart from apprehensions about safety of nuclear power and effect on livelihood. Pre-project works are underway at Haripur in West Bengal.
- (b) Public awareness programmes and outreach activities have been enhanced to allay the fears about safety of nuclear power plants and fears of loss of livelihood. In respect of Kudankulam, the Government has constituted an expert group of 15 specialists for interacting with officials of the state government of Tamilnadu and spokespersons of people in the neighbourhood of Kudankulam project. The expert group had two meetings to explain the factual position on various aspects of the project and dispel apprehensions of sections of the local people. The rehabilitation issue at Jaitapur is being addressed in consultation with the Maharashtra state government. Adequate security measures have been put in place at nuclear power plants to ensure safety and security against external threats.

- (c) The efforts in this regard are beginning to bear fruit. However, it would require a sustained effort over a long time, given the prevailing atmosphere of fear created and spread among the people by groups ideologically opposed to nuclear power.  
([http://www.dae.nic.in/writereaddata/rsus316\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus316_241111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 317**  
TO BE ANSWERED ON 24/11/2011

### EXPERIENCE FROM FUKUSHIMA DISASTER

317. SHRI SHREEGOPAL VYAS:

Will the PRIME MINISTER be pleased to state:

- (a) The steps taken by India to observe cautions, based on experience of Fukushima plant incident in Japan; and
- (b) The ministries which have made consultations, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The government attaches highest importance to ensuring that the use of nuclear energy in the country meets the highest safety standards. Following the Fukushima incident, the Government directed to take up safety reviews of the existing nuclear power plants. Accordingly, Nuclear Power Corporation of India Limited (NPCIL) constituted task forces which reviewed the safety of the existing nuclear power plants in operation and under construction. In parallel, the Atomic Energy Regulatory Board (AERB) also constituted a high level committee to review safety of Indian nuclear power plants. The task forces of NPCIL and the AERB committee have found that Indian nuclear power reactors have sufficient margins and features in the design to withstand extreme natural events. The reports of these task forces have been made public and posted on the websites of DAE/NPCIL and AERB respectively. Recommendations to further enhance the safety in Indian nuclear power plants against extreme natural events have been made by the task forces and the AERB committees. A roadmap for their implementation in a time bound manner has been drawn up and the implementation process has commenced.

To give statutory status to the nuclear safety regulator, the Government has introduced the Nuclear Safety Regulatory Authority (NSRA) Bill.

A decision has been taken to invite IAEA missions, namely, Operational Safety Review Team (OSART) and Integrated Regulatory Review Service (IRRS), for peer review of safety of nuclear power plants and of the regulatory system respectively.

- (b) In the area of emergency preparedness, the National Disaster Management Authority (NDMA) of the Ministry of Home Affairs has drawn up a holistic and integrated programme of "Management of Nuclear and Radiological Emergencies". Consultations have also been held with state governments on emergency preparedness plans.

([http://www.dae.nic.in/writereaddata/rsus317\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus317_241111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 318**  
TO BE ANSWERED ON 24/11/2011

### GERMAN COOPERATION IN ENERGY SECTOR

318. SHRI SHREEGOPAL VYAS:

Will the PRIME MINISTER be pleased to state:

- (a) the matters on which discussions have been held recently with Germany to get its cooperations in energy sector;
- (b) whether the information about reasons for abandoning atomic energy by Germany was obtained in these discussions;
- (c) the countries which have distanced themselves from atomic energy during the last five years and the reasons therefor; and
- (d) the reasons for our so much insistence on atomic energy despite these factors and the possibility of more solar energy from Germany whereas the assurance on atomic energy plants (Kudankulam project) given by our ex- President is also being challenged?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- ( a)to(c) India and Germany have discussed bilateral cooperation in the fields of renewable energy, energy efficiency, solar energy, clean coal technology and carbon capture and sequestration. Some countries are reviewing their nuclear power programmes. Reports indicate that the Governments of Germany and Switzerland plan to phase out nuclear power by 2022 and 2034 respectively. Italy has decided not to reintroduce nuclear power. The demand for growth in power generation in these countries can be met by renewable energy sources. This appears to be the reason for their distancing from harnessing nuclear energy
- (d) In view of India's vast and growing energy needs, nuclear energy is an important clean energy option and will be pursued with full regard to safety, environment and livelihood of the people in the neighbouring areas along with other energy sources, including solar energy, as no single energy source would be adequate to meet India's energy requirements.

([http://www.dae.nic.in/writereaddata/rsus318\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus318_241111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 351**  
TO BE ANSWERED ON 24/11/2011

### IMPORT OF URANIUM

351. SHRI N.K. SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether any agreement for the import of Uranium was signed with South Africa in the India, Brazil, South Africa (IBSA) summit;
- (b) if so, the details thereof; and
- (c) country's requirements of Uranium in the Twelfth Five Year Plans and the amount out of these requirements that needs to be imported?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) No, Sir.

(b) Does not arise.

(c) Imported Uranium can be used only in IAEA safeguarded reactors. For the remaining reactors, indigenous uranium is used. The long term agreement for uranium procurement entered with Kazakhstan and Russia and procurement plans at hand will meet the uranium requirements of safeguarded reactors. Augmentation of uranium mining and milling domestically will enable to meet the requirements of non-safeguarded reactors.

([http://www.dae.nic.in/writereaddata/rsus351\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus351_241111.pdf))



## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 353**  
TO BE ANSWERED ON 24/11/2011

### **REVIEWING OF NUCLEAR POLICY**

353. SHRI MOHD. ALI KHAN:

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether there is a call for India's review of nuclear policy with US and other countries in the Twelfth Plan; and
- (b) if so, the details thereof?

### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)& (b) No, Sir. However, India is committed to expand the nuclear power programme in the twelfth Five Year Plan. The overall programme will include setting up of nuclear power plants with international cooperation.

([http://www.dae.nic.in/writereaddata/rsus353\\_241111.pdf](http://www.dae.nic.in/writereaddata/rsus353_241111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 40**  
TO BE ANSWERED ON 23.11.2011

### LIFE OF NUCLEAR POWER STATIONS

\*40. SHRI JAI PRAKASH AGARWAL:

Will the PRIME MINISTER be pleased to state:

- (a) the names of nuclear power stations whose life span is going to expire;
- (b) the steps taken to prevent the threats of radioactivity caused by these power stations;
- (c) the names of nuclear power stations where incidents of radioactivity leakage have occurred during the last three years and the current year;
- (d) whether the Government has conducted or proposes to conduct any study to assess the impact of radioactivity on the families residing near these stations;
- (e) if so, the details thereof; and
- (f) the action taken or proposed to be taken by the Government in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY

- (a) to (f) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO. 40 FOR ANSWER ON 23.11.2011 BY SHRI JAI PRAKASH AGARWAL REGARDING LIFE OF NUCLEAR POWER STATIONS.

- (a) There is only one nuclear reactor, RAPS-1 at Rawatbhata in Rajasthan which is under extended shutdown condition for meeting regulatory requirements. All other 19 operating reactors have life spans upto their respective stipulated period. Atomic Energy Regulatory Board (AERB) periodically reviews the authorization for continued operation of nuclear power reactors and grants licence for operation for a stipulated period.
- (b) There is no threat of spread of radioactivity from any of the operating nuclear power plants. These plants have sufficient safeguards by way of design features, operating practices and regulatory controls against any major radiological releases.
- (c) During the last three years there have been no incidents of leakage and discharge of radioactivity has never exceeded beyond the limits stipulated by AERB.
- (d)&(e) Epidemiological surveys to assess the effects of radiation have been conducted on the employees and their family members who reside near the nuclear power plants. The surveys have been conducted by reputed medical colleges in the areas where the plants are located and analysed by the Tata Memorial Centre, the premier cancer research institute in India. The surveys have indicated that the operation of nuclear power plants have no ill effects on health of people living near nuclear power plants.

## **Nuclear and Arms Control Centre**

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It may be added here that the radiation dose in addition to the background dose an individual at the plant boundary receives is in the range of 0.42 – 39.60  $\mu\text{Sv}/\text{year}$  (2010) as against the AERB stipulated limit of 1000  $\mu\text{Sv}/\text{year}$ . This dose limit is same as the limit recommended by the International Commission of Radiological Protection (ICRP). For comparison, the average dose to a member of the public due to natural background radiation is 2400  $\mu\text{Sv}/\text{year}$ .

- (f) Monitoring of radioactivity in the neighbourhood of nuclear power plants and radiological survey of nearby water bodies, ground water, food chain including milk, animal products, fruits, vegetables and fish are performed by Environmental Survey Laboratories to ensure that radioactivity level does not exceed limits stipulated by AERB.

([http://www.dae.nic.in/writereaddata/lssq40\\_231111.pdf](http://www.dae.nic.in/writereaddata/lssq40_231111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.237**  
TO BE ANSWERED ON 23.11.2011

### IRRADIATION TECHNOLOGY

237. SHRI NRIPENDRA NATH ROY:

SHRI NARAHARI MAHATO:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has formulated any strategy for use of irradiation technology for food preservation;
- (b) if so, the details thereof;
- (c) whether the Government has conducted any research to ascertain the utility to be derived from irradiation in the field of food preservation;
- (d) if so, the results thereof;
- (e) the number of radiation processing plants set up both in public and private sector in the country during each of the last three years, State-wise; and
- (f) the steps taken to augment the use of this facility in the country?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) Yes, Sir.
- (b) BARC has been engaged in R&D work on the technology of preservation and hygeinisation of food by radiation for the past more than 50 years. The safety and wholesomeness of the technology was endorsed in 1981 by world bodies like World Health Organization, Food & Agricultural Organization, International Atomic Energy Agency, and in 1983 by the Codex Alimentarius Commission that sets global standards for food. Government of India constituted a National Monitoring Agency in 1987 to oversee commercial application of food irradiation in India. Subsequently, in 1991, Atomic Energy Act was amended and Atomic Energy (Control of Irradiation of Food) Rules, 1991 were established. These rules were subsequently amended in 1996. In 1994, Ministry of Health & Family Welfare amended Prevention of Food Adulteration (PFA) Act rules to approve radiation processing of onion, potato and spices. The PFA Act rules were further amended in 1998 and 2001 to approve additional items of food.

Ministry of Health & Family Welfare was approached by the department for approval of the food and agricultural commodities on wider generic/ class-wise basis for radiation processing, so that the radiation processing plants could process more agricultural commodities and be operated around the year for better economic gains. The draft notification for generic approval on class basis was published by the Ministry of Health for public review in May 2007. The Atomic Energy (Control of Irradiation of Food) Rules, 1996, under the Atomic Energy Act are currently under review in this respect with a similar intent. Department of AYUSH, Ministry of Health & Family

## Nuclear and Arms Control Centre

Welfare, Government of India, have also given permission for use of radiation technology for microbial decontamination of medicinal herbs and formulations.

The Department of Atomic energy has the necessary expertise and know-how for setting up radiation processing plants. It has set up two technology demonstration units, one commissioned in the year 2000 for high dose irradiation at Vashi, Navi Mumbai, primarily for hygeinisation of spices, and another in 2002, a low dose irradiation facility, KRUSHAK at Lasalgaon, near Nashik, for sprout control during storage for potato and onion and insect disinfestation of agricultural commodities. The facilities are being operated by the Board of Radiation & Isotope Technology.

In 2004 as a result of persistent efforts of the department, the Ministry of Agriculture & Co-operation, Government of India, amended the plant quarantine regulations, Plant Quarantine (Regulation of Import into India) Order, 2003, to include irradiation as a phytosanitary treatment. In 2006, the United States Department of Agriculture and Department of Agriculture & Co-operation, Government of India, signed a Framework Equivalency Work-plan, to use irradiation as phytosanitary measure for the export of mango to the US, and the USDA-APHIS final rule 'Importation of Mangoes From India' was published on March 12, 2007. More than 157 tonnes of mangoes of different varieties were processed at KRUSHAK and exported to US after a gap of 18 years. A landmark breakthrough was thus achieved in demonstrating commercial feasibility of radiation technology in overcoming quarantine barrier to international trade and obtaining market access. In 2008 the volume of export of mango to US almost doubled to 275 tonnes. In 2009 about 130 tonnes of mangoes were processed and exported to US. A trial consignment of 14.5 tonnes of irradiated mango has been sent to US by sea route to test the feasibility of shipping mango in order to reduce freight costs and make Indian mango cost competitive in the US market. This KRUSHAK facility is being commercially used by Maharashtra State Agricultural Marketing Board (MSAMB) under a tripartite MoU between BARC/BRIT and MSAMB, and approved for irradiation of mango for export to USA. The facility has recently been upgraded to increase its products range. MSAMB has exported nearly 200 tonnes of mango to USA for the past two years.

(c) Yes, sir.

(d) As indicated in Part (b), Food Technology Division (FTD) in BARC has been engaged in R&D work on the technology of preservation and hygeinisation of food and agricultural commodities by radiation since 1950's. Initial two decades were spent on laboratory research on preservation of primary agricultural and horticultural commodities by using radiation technology. This was followed by large-scale studies with agencies like Food Corporation of India, and NAFED (Now NHRDF). In the intervening period considerable research effort was put in studying the wholesomeness and nutritional adequacy of irradiated foods to answer safety concerns related to consumption of irradiated foods. All studies carried out in BARC and other laboratories around the world found no adverse effects of consumption of irradiated foods. All these studies including those from BARC led to approval of this technology at the international and national levels.

The department is continuing to support R&D in this field. In the past decade a number of new products and processes have been developed for shelf life extension of food

## Nuclear and Arms Control Centre

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products, improving food safety, and for overcoming quarantine restrictions in international trade.

- (e) No radiation processing plant has been set up in public sector during the last 3 years. The department has set up two technology demonstration plants one for high dose applications like microbial decontamination of spices and dry ingredients in Vashi, Navi Mumbai, commissioned in the year 2000, and another for low dose applications like sprout control in onion and potato, disinfestations of cereals and quarantine treatment at Lasalgaon, near Nasik in Maharashtra commissioned in the year 2002. Since then the department has encouraged private entrepreneurs to set up such facilities.

The details of radiation processing plants set up in private sector during the past 3 years are given below:

Maharashtra: 2

Hindustan Agro Co-operative Ltd., Rahuri, Ahmednagar (2011)

Agrosurg Irradiators Pvt. Ltd., Mumbai (2009)

Karnataka: 2

Innova Agri Biopark Ltd., Bengaluru (2011)

Microtrol Sterilization Services Pvt Ltd., Bengaluru (2009)

Rajasthan: 1

Jhunsons Chemicals Pvt. Ltd., Bhiwadi, Rajasthan (2010)

- (f) The Department of Atomic Energy has the requisite expertise and know-how for setting up radiation processing plants. The department is helping entrepreneurs interested in setting up radiation processing facilities by way of advice on the technology and engineering aspects. While BARC helps with the technology, BRIT supplies the cobalt-60 source and advises on engineering, dosimetry and regulatory aspects. The entrepreneurs need to sign an MoU with BRIT for this purpose. Financial assistance is available from other agencies of the Government like MoFPI and TDB.

([http://www.dae.nic.in/writereaddata/lsus237\\_231111.pdf](http://www.dae.nic.in/writereaddata/lsus237_231111.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 250**  
TO BE ANSWERED ON 23.11.2011

### **CIVIL NUCLEAR COOPERATION**

250. SHRI PRADEEP MAJHI:

Will the PRIME MINISTER be pleased to state the details of the nuclear projects so far undertaken under the civil nuclear cooperation deal between India and France?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

Presently Nuclear power Corporation of India limited (NPCIL) is considering the techno-economic details of the proposed nuclear power reactors to be set up at Jaitapur, Maharashtra in technical cooperation with France. The work on the project will be started after obtaining the administrative and financial approval of the Government.

([http://www.dae.nic.in/writereaddata/lus250\\_231111.pdf](http://www.dae.nic.in/writereaddata/lus250_231111.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 300**  
TO BE ANSWERED ON 23.11.2011

### DEPOSITS OF RARE EARTHS

300. SHRI PREM DAS RAI:

Will the PRIME MINISTER be pleased to state:

- whether commercially exploitable deposits of rare earths exist in the country;
- if so, the details thereof, State-wise; and
- the steps taken/proposed to be taken by the Government to produce rare earths and export it?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) Monazite is the principal source of rare earths in India. As per the report of Atomic Mineral Directorate for Exploration & Research (AMDER), Hyderabad, the reserves of Monazite in India is about 10.70 million tonnes which translates to approx. 5 million tonnes of rare earth oxide.

(b) The state-wise resources of Monazite established by AMD are as follows:

S. No.	State	Monazite (in million tons) (as of August 2009)
1	Kerala *	1.51
2	Tamil Nadu	2.16
3	Andhra Pradesh	3.74
4	Orissa	1.85
5	West Bengal	1.22
6	Bihar	0.22
Total		10.70

\* including resources of lake and sea bed.

AMD has established about 2000 tons of xenotime bearing heavy minerals concentrate containing about 2% xenotime in the riverine heavy minerals placer deposits of Chhattisgarh and Jharkhand States.

(c) Indian Rare Earths Ltd.(IREL), a public sector undertaking under the Department of Atomic Energy is setting up a Monazite processing plant in Orissa for processing of 10,000 tonnes of monazite and to produce 11,000 tonnes of Rare Earths Chloride per annum. A part of the said production will be transferred to the Rare Earths Division, Always for producing highly pure separated rare earths (RE) and RE compounds to meet the domestic as well as export requirements.

([http://www.dae.nic.in/writereaddata/lsus300\\_231111.pdf](http://www.dae.nic.in/writereaddata/lsus300_231111.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 327**  
TO BE ANSWERED ON 23.11.2011

### MOU BETWEEN NPCIL AND IOC

327. DR. KRUPARANI KILLI:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Nuclear Power Corporation of India Ltd. (NPCIL) and the Indian Oil Corporation have signed Memorandum of Understanding (MoU) to set up nuclear power plants in the country;
- (b) if so, the details thereof;
- (c) the capacity of proposed nuclear power plants;
- (d) whether the sites have been identified for setting up of the same; and
- (e) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir. The MoU between Nuclear Power Corporation of India Ltd. (NPCIL) and Indian Oil Corporation (IOC) was signed on November 04, 2009.
- (b) The MoU covers setting up of Nuclear Power Plants in the country for generation of electricity and any other area as mutually agreed. A Joint Venture Company (JVC) has been incorporated in the name of NPCIL-Indian Oil Nuclear Energy Corporation Limited.
- (c)to(e) Proposal for identification of the Nuclear Power Project to be set up by the JVC between NPCIL & IOC is under consideration of the Government.

([http://www.dae.nic.in/writereaddata/lsus327\\_231111.pdf](http://www.dae.nic.in/writereaddata/lsus327_231111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 339**  
TO BE ANSWERED ON 23.11.2011

### PROTEST OVER NUCLEAR POWER PLANTS

339. SHRI D.B. CHANDRE GOWDA:  
SHRI A.K.S. VIJAYAN:  
SHRI MANICKA TAGORE:  
SHRI A. VENKATA RAMI REDDY:  
SHRI A. GANESHAMURTHI:  
SHRI ANTO ANTONY:  
SHRI P. KUMAR:  
SHRIMATI BOTCHA JHANSHI LAKSHMI:  
SHRI P. LINGAM:  
SHRI PARTAP SINGH BAJWA:  
SHRI GURUDAS DASGUPTA:  
SHRI ASADUDDIN OWAISI:  
DR. M. THAMBIDURAI:  
SHRI S.R. JEYADURAI:  
SHRI DATTA MEGHE:  
SHRI SUGUMAR K.:  
SHRI R. THAMARAISELVAN:  
DR. NILESH N. RANE:

Will the PRIME MINISTER be pleased to state:

- (a) whether the local people and environmentalists are protesting against the setting up of various nuclear power plants in the country including Kudankulam and Jaitapur;
- (b) if so, the details thereof and the reasons for such wide scale protest;
- (c) the present stage of implementation and total expenditure incurred so far on Kudankulam and Jaitapur nuclear power plants;
- (d) whether any study has been conducted about the environmental impact of these plants;
- (e) if so, the details thereof and the corrective measures taken by the Government in this regard;
- (f) the composition and terms of reference of the high level Committee set up by the Government to remove the apprehensions of the people against the setting up of nuclear power plants, particularly Kudankulam Plant;
- (g) the efforts made by the committee so far, in this regard; and
- (h) the steps taken/proposed to be taken by the Government to ensure the safety of such nuclear plants?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Some sections of local people and organisations are protesting against start up of nearly completed nuclear power plants at Kudankulam and setting up of new Nuclear Power Plants at Jaitapur.

## Nuclear and Arms Control Centre

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- (b) The opposition to nuclear power projects by certain section of the population is largely due to apprehensions about safety of nuclear power plants, effect on livelihood of the people living around and issues related to land acquisition. Anti-nuclear groups are spreading unfounded fears amongst local people.
- (c) The work of 2 units each of 1000 Mwe at Kudankulam Nuclear Power Project (KKNPP) is almost complete. Unit-1 is at advanced stage of commissioning with its 'hot run' having been completed. This is the final test following which nuclear fuel in the reactor can be loaded after obtaining clearance from the Atomic Energy Regulatory Board (AERB). Construction of Unit-2 is also closely following the first unit and can be completed a few months from commissioning of Unit-1. The cumulative expenditure on Kudankulam (KKNPP Units-1&2) upto September 2011 has been Rs.14,122 crore.

For the Jaitapur Nuclear Power Project (JNPP), land has been acquired, Environmental and Coastal Regulatory Zone clearances have been obtained and site infrastructure works taken up. The expenditure on JNPP upto September 2011 has been Rs.46 crore. Nuclear Power Corporation of India Limited (NPCIL) is working out the techno-economic details of the proposed European Pressurised Reactor (EPR) Units at Jaitapur.

- (d) Yes, Sir.
- (e) Detailed Environmental Impact Assessment (EIA) studies have been carried out in the case of nuclear power plants at Kudankulam and Jaitapur as a part of the project environment clearance process. The EIA reports have been considered by the Expert Appraisal Committees of Ministry of Environment and Forests in detail before according environmental clearance for these projects. The reports are available in public domain on NPCIL website. The stipulations laid down in the environmental clearances for the projects are scrupulously implemented.
- (f) The Central Government has constituted an expert group of 15 specialists for interacting with nominees of the State Government of Tamilnadu and spokespersons of the people in the neighbourhood of KKNPP to explain the factual position on various aspects of the project and to dispel apprehensions of a section of the local people. The expert group comprises renowned academicians, scientists, doctors and engineers specialising in areas like environmental science, radiation safety, nuclear reactor design, nuclear reactor safety, nuclear regulatory aspects, nuclear waste management, oncology, fisheries, thermal ecology, seismology etc. The expert group is reviewing the factual position on various aspects of the project and are explaining these to the spokespersons of the local people and state government officials.
- (g) The expert group had its first meeting with the state government nominees and spokespersons of the local people on November 8, 2011. The second meeting was held on November 18.
- (h) The safety aspects of the KKNPP were reviewed by the AERB. The nuclear power plants designed in the country as well as those to be set up with international cooperation will follow the directions provided in the AERB codes and guides on design,

## **Nuclear and Arms Control Centre**

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construction, commissioning and operation to ensure safety. The projects undergo regulatory review at each stage of design, construction, commissioning and operation by AERB. Safety of these plants are ensured through compliance of AERB stipulation. All reactors to be set up with international cooperation will need to be certified also by the Nuclear Safety Regulatory Authority of the vendor country.

([http://www.dae.nic.in/writereaddata/lus339\\_231111.pdf](http://www.dae.nic.in/writereaddata/lus339_231111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 340**  
TO BE ANSWERED ON 23.11.2011

### STUDY OF NUCLEAR INSTALLATIONS CAPACITY

340. SHRI SADASHIVRAO DADOBA MANDLIK:

SHRI ANAND PRAKASH PARANJPE:

SHRI EKNATH M. GAIKWAD:

SHRIMATI MEENA SINGH:

SHRI BHUDEO CHOUDHARY:

SHRI PARTAP SINGH BAJWA:

SHRI SANJAY BHOI:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has appointed expert groups to study the nuclear installations capacity to withstand massive seismic shocks following the Fukushima quake-tsunami disaster in Japan;
- (b) if so, the details thereof;
- (c) whether all nuclear installations in the country have passed structural tests conducted by expert groups;
- (d) if so, the details thereof;
- (e) whether all preventive measures suggested by the expert groups have been accepted by the Government; and
- (f) if so, the details thereof and the progress made in implementation of these preventive measures?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) & (b) The Central Government had directed Nuclear Power Corporation of India Limited (NPCIL) to conduct a safety review of all nuclear power stations in operation and of those under construction in the context of the Fukushima incident, including their ability to withstand extreme external events like earthquakes and Tsunamis. Accordingly, NPCIL constituted task forces, four for the reactors of different technologies in operation and two for reactors of different technologies under construction. In parallel, a committee was also constituted by the Atomic Energy Regulatory Board (AERB) to review the safety of nuclear power reactors in operation and under construction.

(c) & (d) The NPCIL task forces and AERB committee have carried out extensive re-evaluation of the safety status of nuclear power plants based on permissible stress values in structures, components and equipment. The analysis concluded that adequate margins exist in the structures, equipment, systems etc. to withstand extreme external events including seismic shock waves

## **Nuclear and Arms Control Centre**

several times the design values. The reports of NPCIL task forces and AERB committee have been made public and are also posted on DAE/NPCIL and AERB web sites, respectively.

- (e) & (f) The recommendations made by the task forces and committee to further enhance the safety of the nuclear power plants have been accepted. A road map for implementation of the recommendations in time bound manner has also been drawn up. The process of implementation of recommendations has commenced.

([http://www.dae.nic.in/writereaddata/lsus340\\_231111.pdf](http://www.dae.nic.in/writereaddata/lsus340_231111.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 361**  
TO BE ANSWERED ON 23.11.2011

### NUCLEAR POWER PROGRAMME

361. SHRI N. CHALUVARAYA SWAMY:

Will the PRIME MINISTER be pleased to state:

- the details of the targets fixed for generation of nuclear power during the Eleventh Plan, plant-wise;
- the details of targets achieved till now during the Eleventh Plan;
- whether the country is short of nuclear power generation;
- if so, the details thereof, plant-wise; and
- the steps taken by the Government to increase nuclear power generation in the country?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)&(b) The target for generation of nuclear power plants in the XI Five Year Plan was 1,63,395 Million Units (MUs) which was revised to 1,24,608 MUs at the Mid Term Appraisal (MTA) stage. The generation in the XI Plan upto October 2011 has been 96,019 MUs and the generation in the XI Plan is expected to be 1,09,000 MUs. The plant wise details are as follows:

Unit	XI Plan Target (MU)		Achievement upto October 2011 (MU)
	Original	MTA	
TAPS 1to4	40,108	39,555	36,763
RAPS 2 to 4	20,592	17,319	16,660
RAPS 5&6	12,361	6,738	5,147
MAPS 1&2	12,853	10,773	8,965
NAPS 1&2	10,717	7,239	5,230
KAPS 1&2	10,422	8,855	7,962
KGS 1&2	12,756	11,933	10,185
KGS 3&4	11,611	6,364	5,107
KK 1&2 *	29,784	15,832	0
PFBR *	2,190	0	0
<b>TOTAL</b>	<b>1,63,395</b>	<b>1,24,608</b>	<b>96,019</b>

([http://www.dae.nic.in/writereaddata/lus361\\_231111.pdf](http://www.dae.nic.in/writereaddata/lus361_231111.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 390**  
TO BE ANSWERED ON 23.11.2011

### SETTING UP OF NUCLEAR POWER PLANTS

390. DR. BHOLA SINGH:

SHRI RAMESH VISWANATH KATTI:

SHRI DUSHYANT SINGH:

SHRI PRADEEP MAJHI:

SHRI R. THAMARAISELVAN:

SHRI KISHNBHAI V. PATEL:

Will the PRIME MINISTER be pleased to state:

- whether the Government proposes to set up new nuclear power plants in the country during the remaining period of the XIth and the XIIth Plans;
- if so, the details alongwith the proposed locations thereof;
- the status of work at the various nuclear power reactors which are under construction; and
- the year in which construction started at these sites and the time by which they are likely to be made operational?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)& (b) The construction work for Kudankulam Unit 1 and Unit 2 is nearly complete. Unit 1 is expected to be commissioned during the current XI Five Year plan, while unit 2 is expected to be commissioned in the first year of the next XII Five Year plan period. New projects of 2800 MW capacity, comprising Kakrapar Atomic Power Project (KAPP), Units-3&4 (2 x 700 MW) and Rajasthan Atomic Power Project (RAPP), Units-7&8 (2 x 700 MW ) have been launched in the XI Plan. No new projects are planned for launch in the remaining period of this plan. Start of work on new nuclear power project and pre-project activities are planned in the XII Plan as per the following details:

Project	Location	Capacity (MW)
Gorakhpur 1&2	Gorakhpur, Haryana	2 x 700
Chutka, 1&2	Chutka, Madhya Pradesh	2 x 700
Mahi Banswara, 1&2	Mahi Banswara, Rajasthan	2 x 700
Kaiga, 5&6	Kaiga, Karnataka	2 x 700
Kudankulam, 3&4	Kudankulam, Tamilnadu	2 x 1000
Jaitapur, 1&2	Jaitapur, Maharashtra	2 x 1650
Kovvada, 1&2	Kovvada, Andhra Pradesh	2 x 1500
Chhaya Mithi Viridi, 1&2	Chhaya Mithi Viridi, Gujarat	2 x 1100
FBR 1&2	Kalpakkam, Tamilnadu	2 x 500
AHWR	Location to be decided	300



## Nuclear and Arms Control Centre

In addition, pre-project activities are planned at Bhimpur in Madhya Pradesh and Haripur in West Bengal.

- (c) Seven nuclear power reactors with a capacity of 5300 MWe are under construction. Of these KKNPP, Units-1&2 (2x1000 MWe) at Kudankulam, Tamilnadu are at advanced stage of commissioning. Unit-1 of Kudankulam is expected to be completed towards end of 2011-12 and Unit-2 in 2012-13. Prototype Fast Breeder Reactor (PFBR 500 MW) at Kalpakkam in Tamilnadu is at advanced stage of construction and is expected to attain mechanical completion in 2013-14 and start generation in 2015. Civil construction is in progress in KAPP, Units-3&4 (2 x 700 MW) at Kakrapar in Gujarat and RAPP, Units-7&8 (2 x 700 MW) at Rawatbhata in Rajasthan. The major equipment and works packages for these projects have been ordered.
- (d) The Details are as follows:

Project	Location	Work started (First pour of concrete)	Expected completion
KKNPP 1&2	Kudankulam, Tamilnadu	March 30, 2002	2011-12
PFBR	Kudankulam, Tamilnadu	October 23, 2004	2013-14
KAPP 3&4	Kakrapar, Gujarat	November 22, 2010	2015-16
RAPP 7&8	Rawatbhata, Rajasthan	July 18, 2011	2016-17

([http://www.dae.nic.in/writereaddata/lsus390\\_231111.pdf](http://www.dae.nic.in/writereaddata/lsus390_231111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 431**  
TO BE ANSWERED ON 23.11.2011

### DANGER FROM ATOMIC PLANTS

431. SHRI HANSRAJ G. AHIR:

SHRI HARI MANJHI:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Atomic Energy Regulatory Board and Bhabha Atomic Research Centre have constituted Committees to study the safety aspects of the nuclear installations in the country;
- (b) if so, the details thereof;
- (c) whether these Committees have submitted their reports;
- (d) if so, the recommendations made by the said Committees and the steps taken/proposed to be taken by the Government to implement the same; and
- (e) if not, the time by which the reports are likely to be submitted?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY

- (a)&(b) Yes Sir, following the Fukushima incident the Atomic Energy Regulatory Board (AERB), the Nuclear Power Corporation of India (NPCIL) and Bhabha Atomic Research Centre (BARC) constituted 6 committees (one by AERB and 4 Task Groups by NPCIL and one by BARC) to study the existing / planned emergency provisions at already operating and upcoming Nuclear Power Plants (NPPs) for responding to natural events like flood, fire, earthquake and Tsunami. The focus was mainly on beyond-design-basis events (See ANNEX-1).
- (c) Yes, Sir. All the committees have submitted their reports and recommendations.
- (d) The summary of their mandate and the recommendations are enclosed as ANNEX-2. It may be noted from the summary report that the process is already on to implement the recommended additional provisions in our existing and upcoming NPPs so as to effectively respond to emergencies that may arise due to natural events and total power failure called Station Black Out (SBO).
- (e) Does not arise.

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Committees Constituted:

AERB:

Committee to Review the Safety of Indian Nuclear Power Plants in the light of earthquake and Tsunami in Japan

NPCIL:

Following four task groups constituted to review and recommend safety measures in following NPPs

1. Boiling Water Reactors (BWR) (TAPS 1 & 2)
2. Pressurized Heavy Water Reactors (PHWRs) at RAPS 1 & 2
3. PHWRs at MAPS 1 & 2
4. Standard PHWRs from NAPS onwards

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Safety Re-Evaluation of Indian NPPs and Recommendations to upgrade safety provisions in the light of the Fukushima Event by AERB and NPCIL.

#### **AERB:**

The accident at Fukushima dai-ichi was mainly caused by Severe flooding caused by the beyond design basis Tsunami, and Consequent prolonged station black out (SBO) i.e. loss of off-site as well as on-site AC power supplies at the NPP. The committee set up by Chairman, AERB drew up its work plan with focus on Beyond Design Basis Events (BDBE) of natural origin and prolonged SBO. The major tasks were to: (i) Develop the guidelines for deciding on the magnitude and related issues concerning beyond design basis external events of natural origin, (ii) assess the response of the boiling water reactors of TAPS-1&2, Pressurized Heavy Water Reactor (PHWR) based NPPs, VVERs, (iii) examine the safety issues related to radioactive waste disposal facilities at the NPPs, spent fuel storage facilities the SBO and (iv) examine the severe accident management guidelines for NPPs.

Some of the key conclusions are presented below.

The submarine faults capable of generating Tsunamis are located at very large distances of more than 800km from the Indian coast. Thus, the possibility of simultaneous occurrence of an earthquake and a Tsunami at Indian NPPs, is almost non-existent.

In PHWRs, cooling of the reactor core, with the plant in hot shut down state, is possible by natural convection flow of reactor coolant through steam generators. With the design provision for charging water to the secondary side of the steam generators using diesel engine driven pumps, this mode of core cooling can be maintained even under extended SBO. In the case of the BWRs at TAPS-1&2, core cooling under SBO can be maintained up to about 8 hours by natural convection circulation of reactor coolant through the emergency condenser. Heat from the coolant is removed by boiling of water present on the secondary side of the emergency condenser. Submergence of the fuel in the spent fuel pool is assured for a time period of at least one week under SBO, even with the most conservative assumptions on the quantum of decay heat from the stored fuel and without any credit for operator action.

#### **Following are some of the major recommendations.**

(i) Better treatment of uncertainties in data and certain computational procedures to obtain a high degree of conservatism in the assessment of the magnitude of design basis external events of natural origin (ii) implementation of seismic signal based automatic reactor trip in all reactor units where it is not yet provided. Seismic switches and sensors that are located outside the reactor buildings should be protected against any flooding at the site

The Fukushima accident has shown that occasionally the magnitude of natural events can be higher than what is considered in design. While design basis external events should govern the design of SSCs, functionality of the most safety relevant SSCs should still be maintained under extreme events.

## Nuclear and Arms Control Centre

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A beyond design basis external event may disable the facilities available at the NPP site for monitoring and control of important reactor parameters. It may also result in physical isolation of the site such that it may not be possible to receive outside help for a considerable period of time. Creation of an emergency facility at each NPP site which will remain functional under such conditions is therefore recommended. The facility should have adequate radiation shielding and should be seismically qualified. It should also have provisions for communication with relevant agencies and for obtaining information from all units at the site to help decide on further course of actions, as also for food, resting etc. for essential personnel for a period of about one week. The practice of storing spent radioactive ion exchange resins in underground tanks should be discontinued as in case of earthquake or severe flooding this can cause spread of radioactive contamination.

### **NPCIL:**

Re-assessment of safety against internal and external events and walkdowns were undertaken by NPCIL at all the NPPs to inspect all important provisions required to withstand flood and fire events. The recommendations made are the following. (i) Automatic reactor shutdown initiation sensing seismic activity, (ii) Inerting of the TAPS-1&2 containment, (iii) Increasing the duration of the passive power sources/battery operated devices for monitoring important parameters for a longer duration, (iv) provisions for hook up arrangements through external sources, for adding cooling water inventory to Primary Heat Transport (PHT) system, steam generators, calandria, calandria vault, end shields and Emergency Core Cooling System (ECCS) as applicable and also the provisions for mobile diesel driven pumping units, (v) Augmentation of water inventory and the arrangement for transfer of water from the nearby sources if required, (vi) Revision of Emergency Operating Procedures (EOPs) to include additional provisions,

(vii) Organize structured training programs to train plant personnel on modified EOPs, (viii) Additional Shore protections measures at Tarapur Atomic Power Station and Madras Atomic Power Station which are located on the sea coasts, as deemed necessary, (ix) Additional hook up points for making up water to spent fuel storage pools wherever necessary for ensuring sufficient inventory

### **Implementation:**

A detailed implementation programme is being worked out to address all the identified requirements. This exercise will be updated at a later stage when the detailed chronological events of Fukushima become available.

### **BARC:**

BARC has concentrated on the analysis of the event at Fukushima, Japan, its impact on Indian environment and response of BWRs in India under extreme natural events resulting in Station Black Out. The report is currently being reviewed in the Department.

([http://www.dae.nic.in/writereaddata/lus431\\_231111.pdf](http://www.dae.nic.in/writereaddata/lus431_231111.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 432**  
TO BE ANSWERED ON 23.11.2011

### STRESS TEST

432. SHRI MANISH TEWARI:

Will the PRIME MINISTER be pleased to state:

- (a) whether protests over Nuclear Power Stations at Kudankulam (Tamil Nadu), Jaitapur (Maharashtra) and Haripur (West Bengal) have delayed their commissioning/construction;
- (b) if so, the details thereof;
- (c) whether fears of Fukushima like accident taking place at these proposed plants are justified and if not, the reasons therefor;
- (d) whether the Government has conducted "stress test" of existing units after Fukushima accident;
- (e) if so, the detailed compilation in this regard of every unit;
- (f) whether safety of above nuclear power stations from point of view of tsunamis and flood hazards has been assessed;
- (g) if so, the findings thereof;
- (h) whether the Government has any plans to further acquire land in neighbouring villages, leading to displacement of locals, at above sites;
- (i) if so, the details thereof;
- (j) the estimated rate at which energy will be supplied by above plants and how does this compare with solar and wind energy;
- (k) whether spent fuel from these reactors can cause any radiation hazards; and
- (l) if so, the details thereof?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)&(b) The Kudankulam Nuclear Power Plant (KKNPP), (Units-1&2 of 1000 MWe each) in Tamilnadu are in an advanced stage of construction and commissioning. The Unit-1 is 99.2% and the Unit-2 is 95% completed. The recent protests at Kudankulam have delayed the start-up of the project. For the Nuclear Power Plant at Jaitapur in Maharashtra, land is acquired and environmental clearances are accorded by Ministry of Environment and Forests. Currently, infrastructure development at the site is in progress. The construction of nuclear power plant at the site has not started yet. In case of Haripur in West Bengal, the pre-project activities are underway.

(c) The fears of a Fukushima like accident taking place in India at these locations are perceived on account of misinformation spread by the lobbies with ideological opposition to nuclear power. The seismic and tsunamigenic setting is different at these locations from that of Fukushima and the reactors planned to be set up at these locations have advanced safety features and provisions in the designs that can safely handle extreme natural events.

## Nuclear and Arms Control Centre

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- (d)&(e) The Government has carried out safety reviews (stress tests) of the reactors in operation and of those under construction in the country including the Kudankulam reactors. In respect of reactors to be set up at Jaitapur, the review is currently underway by the French regulatory authority, which will be followed by a further review to be undertaken by Atomic Energy Regulatory Board (AERB) in India. The reactors to be set up at Haripur will be similar to the Kudankulam reactors. The safety reviews have indicated that Indian nuclear power reactors in operation and under construction including Kudankulam have adequate margins and provisions in design to withstand extreme natural events. Major finding of the safety review carried out post Fukushima event are summarised in Annexure-I.
- (f) Yes, Sir.
- (g) The nuclear power plants at existing sites have adequate margins and provisions in design to withstand extreme natural events.
- (h)&(i) There is no proposal to acquire any additional land at existing sites including Kudankulam and Jaitapur. Land at Haripur is yet to be acquired.
- (j) The tariff of the electricity from Kudankulam is expected to be about Rs.2.50 per unit, which is lower than the tariffs for wind and solar energy. While evaluating the project proposal for the Jaitapur Plant we are ensuring that the tariff is comparable with the tariff from other generating unit based on other technologies in the same region and in the expected year of plant commissioning.
- (k)&(l) No, Sir. The spent fuel will be temporarily stored in specially designed and radiation shielded facilities as per the well proven procedures in accordance to regulatory requirements at the plant site before transporting the same for reprocessing plant for reprocessing.

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### Annexure – I

Findings of the Safety Review of Indian Nuclear Power Plants and recommendations:

- Automation reactor shutdown initiation sensing seismic activity.
- Augmentation of cooling water inventories and provisions for additional hook up arrangements through external sources and provision of mobile diesel driven pump sets.
- Increasing the duration of the passive power sources/battery operated devices for monitoring important parameters for a longer duration.
- Additional shore protections measures at Tarapur Atomic Power Station and Madras Atomic Power Station.
- Revision of Emergency Operating procedures (EOPs) and structured training programs to train plant personnel on modified EOPs.
- Inerting (filling up of the containment with nitrogen) of the TAPS-1&2 containment.
- MAPS flood level estimation review and revision in design provisions to address the same.
- Periodic maintenance and surveillance programme of fire water system.
- Starter batteries and chargers to be located at higher elevation above maximum flood level.
- In TAPS-1&2, raising of safety systems including Class III power system to meet the revised design flood level.
- Making provisions for severe accident management.
- External events revised guidelines to be generated by considering uncertainties in data and computation techniques to obtain higher degree of conservatism in the design basis of natural events and inclusion in AERB regulations.

([http://www.dae.nic.in/writereaddata/lsus432\\_231111.pdf](http://www.dae.nic.in/writereaddata/lsus432_231111.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO. 508**  
TO BE ANSWERED ON 08.09.2011

### POWER GENERATED BY ATOMIC ENERGY

508. SHRI RAMCHANDRA PRASAD SINGH:

Will the PRIME MINISTER be pleased to state:

- whether it is a fact that electricity is generated through atomic energy in the world;
- if so, the percentage of electricity generated from atomic energy in America, England, Japan, Germany, Australia, Switzerland, Iran, Gulf countries, China, Pakistan, etc.; and
- the target fixed in India, in percentage, for generating electricity through atomic energy?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) to (c) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION  
NO. 508 FOR ANSWER ON 08.09.2011 BY SHRI RAMCHANDRA PRASAD SINGH  
REGARDING POWER GENERATED BY ATOMIC ENERGY

- Yes, Sir.
- Presently, thirty countries are generating electricity from nuclear power through 439 nuclear power reactors. Nuclear power contributes about 14% of the world's total electricity generation. The percentage of electricity generated from nuclear power in some of the countries are as follows :

Country	Percentage Share in 2010
UNITED STATES OF AMERICA	19.59
UNITED KINGDOM	15.66
JAPAN	29.21
GERMANY	28.38
SWITZERLAND	38.01
CHINA	1.82
PAKISTAN	2.60
FRANCE	74.12
SLOVAKIA	51.80
CZHECH REPUBLIC	33.27

Australia and gulf countries do not have nuclear power plants in operation at present. In Iran, the first nuclear power plant has recently been connected to the grid.

- India proposes to set up about 20,000 MW nuclear power generation capacity by 2020. Targets for generation of electricity from nuclear power are fixed annually based on fuel

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availability, planned maintenance shutdowns of existing units, expected new capacity additions etc. The generation of electricity from nuclear power during the year 2010-11 was 26,473 Million Units (MUs) against the target of 22,000 MUs. This was 3.3% of the electricity generated in the country during the year. The target for the year 2011-12 is 32,000 MUs of which 10,675 MUs have been generated from April to July 2011. The share of nuclear power generation in the country is expected to increase gradually with the capacity addition.

([http://www.dae.nic.in/writereaddata/rssq508\\_080911.pdf](http://www.dae.nic.in/writereaddata/rssq508_080911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO \* 510**  
TO BE ANSWERED ON 08.09.2011

### COMMISSIONING OF FIRST PHASE OF JAITAPUR NUCLEAR PROJECT

510. SHRI A. ELAVARASAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether the commissioning of the first phase of the 9,900 MW Jaitapur nuclear power project is delayed by one year since the developer, Nuclear Power Corporation (NPC) is upgrading the safety application in the wake of the Fukushima disaster;
- (b) if so, the details thereof;
- (c) whether the first Evolutionary Pressurised Reactor (EPR) of 1,650 MW would be operational in 2018-19 instead of the originally planned 2017-18; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) to (d) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION  
NO. 510 FOR ANSWER ON 08.09.2011 BY SHRI A. ELAVARASAN REGARDING  
COMMISSIONING OF FIRST PHASE OF JAITAPUR NUCLEAR PROJECT

(a)&(b) The gestation period (from first pour of concrete to commercial operation) of Evolutionary Pressurised Reactors (EPRs) is expected to be 66 months. The schedule for commercial operation of the Jaitapur project comprising twin units of 2 x 1650 MW EPRs form part of the detailed project proposal. The detailed project proposal is presently under discussion between NPCIL and Areva, France. The schedule for commercial operation of the project shall be frozen after finalization of discussions and approval of the project by the Government.

In the context of Fukushima incident, the safety of nuclear power reactors planned at Jaitapur are to be reviewed by the designers and regulators in the vendor country and also by the regulatory authority in India to ensure highest level of safety under such extreme events. The review is undertaken parallelly with the pre-project activities and discussions on the detailed project proposals are currently in progress.

(c)&(d) After financial sanction, the construction work of the project will commence. The date of operation of the first EPR would depend on the date of commencement of construction

([http://www.dae.nic.in/writereaddata/rssq510\\_080911.pdf](http://www.dae.nic.in/writereaddata/rssq510_080911.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO. \* 520**  
TO BE ANSWERED ON 08.09.2011

### SAFETY OF TARAPORE NUCLEAR POWER PLANT

520 SHRI P. RAJEEVE:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that at the Tarapore Nuclear Power Plant, units 1& 2, are Boiling Water Reactors (BWRs), similar to ones at Fukushima, Japan;
- (b) the magnitude of earthquake on the Richter Scale that units 1 & 2 at Tarapore are equipped to withstand;
- (c) whether these units at Tarapore are equipped to withstand an earthquake measuring 9.0 on the Richter Scale, similar to the one that struck Japan on March 11, 2011; and
- (d) if not, the steps being taken to ensure that these units are equipped to withstand earthquakes of this magnitude?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) to (d) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION  
NO. 520 FOR ANSWER ON 08.09.2011 BY SHRI P. RAJEEVE REGARDING SAFETY OF  
TARAPORE NUCLEAR POWER PLANT

- (a) Tarapur Atomic Power Station, Units 1&2 (TAPS 1&2) are Boiling Water Reactors with enhanced features compared to the nuclear power units at Fukushima in Japan. The enhanced features include (i) Primary Containment Volume to Power ratio is 10 times more than Fukushima nuclear power plants and (ii) provision of an emergency condenser which can remove heat emanating from radioactive decay process even in absence of electric power supply. The higher containment volume to power ratio results in slow pressure build up in the primary containment in the event of loss of cooling as experienced in Fukushima incident. The emergency condenser ensures cooling of the fuel in the reactor even under conditions of total loss of power supply, thus assuring higher safety.
- (b)&(c) The seismic hazard of Tarapur site (Zone 3 in seismic map) is different from that of Fukushima (Zone 5) in Japan. TAPS 1&2 are designed for a 5.7 magnitude earthquake in the Richter scale and corresponding peak ground acceleration. The

## **Nuclear and Arms Control Centre**

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recent assessment of the safety margin of TAPS 1&2 has concluded that the plants have adequate safety margins to withstand potential earthquakes in Tarapur site.

(d) Does not arise.

([http://www.dae.nic.in/writereaddata/rssq520\\_080911.pdf](http://www.dae.nic.in/writereaddata/rssq520_080911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.3876**  
TO BE ANSWERED ON 08.09.2011

### USE OF RADIATION TECHNOLOGY

3876. SHRIMATI VASANTHI STANLEY:

Will the PRIME MINISTER be pleased to state:

- (a) to what extent the DAE is successful in using radiation technology in the field of agriculture, medicine and industry;
- (b) if so, the details thereof; and
- (c) if not, the reasons therefor?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Radiation and radioisotope technologies have been successfully and extensively deployed as non-power applications for societal benefit in Agriculture, Healthcare and Industry. These applications have made considerable impact in terms of availability of improved crop varieties especially, oil seeds and pulses, microbiological safety of food and enhancement of shelf-life of certain vegetables and fruit and their export; diagnosis of and treatment of several health conditions, particularly of cancer; and industrial radiography.

- (b) The details of the applications of radiation technology are as given hereunder:-

Agriculture:

Mutation breeding for crop improvement is an active area of research at the Bhabha Atomic Research Centre, Trombay, Mumbai. Development of mutant varieties of crop seeds especially in oilseeds and pulses using radiation technology is an ongoing process at BARC. Using radiation induced mutation and cross-breeding, 39 new crop varieties (Trombay varieties) developed at BARC have been released and Gazette notified by the Ministry of Agriculture, Government of India for commercial cultivation. These include 20 in oil seeds (14-groundnut, 3-mustard, 2 soybean, 1 sunflower), 17 in pulses (8-green gram, 4-black gram, 4-pigeonpea, 1-cowpea) and one each in rice and jute (Table 1). All of them are high yielding, some with additional desirable characters like disease resistance, early maturity, suitability to rice fallows, improved quality parameters etc.

Food Preservation:

BARC has been engaged in R&D work on the technology of preservation and hygienisation of food by radiation for the past more than 50 years.

The Department of Atomic energy has the necessary expertise and know-how for setting up radiation processing plants. It has set up two technology demonstration units, one commissioned in the year 2000 for high dose irradiation at Vashi, Navi Mumbai, primarily for hygienisation of spices. The facility is being operated by Board of Radiation & Isotope Technology (BRIT). A low dose irradiation facility, KRUSHAK at Lasalgaon, near

## Nuclear and Arms Control Centre

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Nashik, for sprout control during storage of onion, potato, and insect disinfection of agricultural commodities including quarantine treatment of mango for export is being commercially operated by Maharashtra State Agricultural Marketing Board (MSAMB) under an MoU with BARC and BRIT. The facility has recently been upgraded to increase its products range.

The department is encouraging private entrepreneurs for setting up radiation processing facilities. The Board of Radiation & Isotope Technology has signed more than 24 MoUs with entrepreneurs, both in private and co-operative sectors, for setting up radiation processing plants.

### Medicine:

Radioisotopes of several elements such as iodine (I-125, I-131), Technetium (Tc-99m), Sodium (Na-24), Fluorine (F-18), Samarium (Sm-153), Lutetium (Lu-177) etc are used to make radiopharmaceuticals or tracer molecules or radioimmunoassay kits for use in healthcare. Variety of <sup>99m</sup>Tc based radiopharmaceuticals are supplied by DAE for diagnosis of cardiac, renal, liver, bone and thyroid diseases. Cancer patients are also benefited by the use of <sup>131</sup>I based therapeutic radiopharmaceutical for treatment of thyroid cancer. <sup>177</sup>Lu based radiopharmaceutical is used for treatment of neuroendocrine tumors. Bone metastasis is treated by <sup>153</sup>Sm based radiopharmaceutical. <sup>125</sup>I is used for treatment of ocular cancer. In addition Radioactive cobalt (Co-60) is used for treatment of cancer (teletherapy). DAE have very successfully deployed these materials and sources not only in its own healthcare facilities such as Tata Memorial Centre (TMC) and Radiation Medicine Centre (RMC) but also in several diagnostic centres across the country.

### Bhabhatron:

Radiation therapy is one of the established modes for the treatment of localized cancers. In our country, there is shortage of radiotherapy treatment facilities, mainly due to the high cost of imported machines. Realizing the need of technology for affordable radiation therapy machines, Bhabha Atomic Research Centre (BARC) successfully developed indigenous Cobalt-60 Teletherapy Machine named Bhabhatron. It is not only less expensive, but also has a number of advanced features hitherto unavailable in similar imported machines presently available. This machine is now commercially produced by Panacea Ltd and so far 18 units are operational, including one in Vietnam (donated through the IAEA). Seven more units will be commissioned shortly.

### Industry:

A number of radioisotopes are routinely used in industry for addressing a variety of problems. The industries include Petroleum, Petrochemicals and Fertilizers, including overseas viz. Sri Lanka's Petroleum Industry. Some of the important applications are listed below:

#### 1) Radiation processing for material modification:

- i) Diamond irradiation for colour enhancement.
- ii) Hydrogels for health care applications.
- iii) Development of polymers as battery separators.
- iv) Polymers for cleaning industrial effluents (removal of dyes, heavy metal, etc.)
- v) Electron beam processing of cables insulations and automobile tyre.

## Nuclear and Arms Control Centre

- 2) Quality control of manufactured components:
    - i) Gamma scanning technique for online diagnosis of long columns and towers in petroleum and petrochemical industry.
    - ii) Nucleonic control system for industry.
      - iii) Radio-tracers for detecting leakages in Heat exchangers & optimizing operating process conditions.
    - iv) Radio-tracers for sedimentation transport in all sea ports in India.
    - v) Radio-tracer for efficient management of oil fields.
  - 3) Radio-tracer for optimum utilization of fertilizer by plants.
- (c) Does not arise.

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Table 1

Trombay crop varieties released and notified for commercial cultivation by Ministry of Agriculture, Government of India

Variety	Year of release	States	Special features
<b>Groundnut</b>			
TDG 39/ TBG 39		Karnataka / Rajasthan	Large seed, medium maturity, high oleic acid, more number of branches.
TG 51	2008	Orissa, West Bengal, Assam, North Eastern states	Early maturity, medium large seed, high shelling %, more 3-seeded pods
TLG 45	2007	Maharashtra	Large seed, medium maturity
TG 38	2006	Orissa, West Bengal, Assam, North Eastern states	High shelling %, more 3-seeded pods, more round seeds, stem rot tolerance
TPG 41	2004	All India	Large seed, medium maturity, 20 days fresh seed dormancy, high oleic acid.
TG 37A	2004	Haryana, Rajasthan, Punjab, Uttar Pradesh, Gujarat, Orissa, West Bengal, Assam, North Eastern states	High yield, smooth pods, wider adaptability, collar rot and drought tolerance
TG 26	1996	Gujarat, North Maharashtra, Madhya Pradesh	Earliness, high harvest index, 20days seed dormancy, smooth pods, salinity tolerance
TKG 19A	1996	Maharashtra	Large seed size, 30 days fresh seed dormancy
TG 22	1994	Bihar	Medium large seed, 50 days fresh seed dormancy
TAG 24	1992	Maharashtra, Orissa, Karnataka, Rajasthan, West Bengal	Semi-dwarf, earliness, high yield, high partitioning %, wider adaptability
Somnath (TGS 1)	1991	Gujarat	Large seed, semi-runner type
TG 3	1987	Kerala	Less number of branches.
TG 17	1985	Maharashtra	No secondary branches, 30days seed dormancy.
TG 1	1973	Maharashtra	High yield, large seed, more branches, 50 days seed dormancy
	2007	Maharashtra	Black seed coat, tolerant to drought
<b>Soybean</b>			
TAMS 98-21	2007	Maharashtra	High yielding, resistant to bacterial pustules, Myrothecium leaf spot, soybean mosaic virus diseases



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TAMS-38	2005	Maharashtra	Early maturing, resistant to bacterial pustule, Myrothecium leaf spot
<b>Mustard</b>			
TPM-1	2007	Maharashtra	Yellow seed Tolerant to powdery mildew
TM-2	1987	Assam	Appressed pod
TM-4	1987	Assam	Yellow seed
<b>Mungbean (Green gram)</b>			
TM 2000-2	2010	Chhattisgarh	Suitable for rice fallows and resistant to powdery mildew
TM-96-2 (Trombay Pesara)	2007	Andhra Pradesh (rabi and summer) and rice fallows	Resistant to powdery mildew and Corynespora leaf spot
TJM-3	2007	Madhya Pradesh	Resistant to powdery mildew, yellow mosaic virus and Rhizoctonia root –rot diseases.
TMB-37	2005	Eastern Uttar Pradesh, Bihar, Jharkhand, West Bengal, Assam	Tolerant to yellow mosaic virus
TARM-18	1995	Maharashtra	Resistant to powdery mildew
TARM-1	1995	Maharashtra, Gujarat, Madhya Pradesh, Andhra Pradesh, Kerala, Karnataka, Tamil Nadu, Orissa	Resistant to powdery mildew
TARM-2	1992	Maharashtra	Resistant to powdery mildew
TAP-7	1983	Maharashtra, Karnataka	Tolerant to powdery mildew
<b>Pigeonpea</b>			
TJT- 501	2009	Madhya Pradesh, Gujarat, Maharashtra, Chhattisgarh	High yielding, early maturing, tolerant to Phytophthora blight
TT-401	2007	Madhya Pradesh, Gujarat, Maharashtra, Chhattisgarh	High yielding, tolerant to pod borer and pod fly damage
TAT-10	1985	Maharashtra	Early maturing
TT-6	1983	Madhya Pradesh, Gujarat, Maharashtra, Karnataka, Kerala, Andhra Pradesh	Large seed
<b>Urdbean (Black gram)</b>			
TU 94-2	1999	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu	Resistant to yellow mosaic virus
TAU-2	1992	Maharashtra	High yielding
TPU-4	1992	Maharashtra, Madhya Pradesh	Large seed
TAU-1	1985	Maharashtra	Large seed
<b>Cowpea</b>			
TRC-77-4 (Khalleshwari)	2007	Chhattisgarh (rabi)	Suitable for rice based cropping system
<b>Rice</b>			
Hari	1988	Andhra Pradesh	Slender grain type
<b>Jute</b>			
TKJ-40	1983	Orissa	High yielding

Abbreviations: A : Akola, AM : Amaravathi, B: Bikaner, D: Dharwad,

G : groundnut, J : Jawahar, K: Konkan, K: Kendrapara, L : Latur,

M : mung/mustard, MB: mungbean, P : Phule/Phaseolus (TAP-7),

R: Raipur, R: Resistant (TARM-18)/Rabi (TARM-1,2), S : soybean/ sunflower,

T : Trombay, T : tur, U : urid.

([http://www.dae.nic.in/writereaddata/rsus3876\\_080911.pdf](http://www.dae.nic.in/writereaddata/rsus3876_080911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.3877**  
TO BE ANSWERED ON 08.09.2011

### URANIUM MINE IN ANDHRA PRADESH

3877. SHRI RAMDAS AGARWAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that the Department of Atomic Energy (DAE) has discovered that the upcoming uranium mine in Andhra Pradesh's Tumulapalli was about 49,000 tonnes quantity;
- (b) whether it is estimated that abovementioned deposits could go up to around 1.5 lakh tonnes, which would make it among the world's largest uranium mines;
- (c) if so, the details in this regard; and
- (d) the time bound programmes/plans of Government to extract indigenous uranium from these mines keeping in view Nuclear Power Corporation's plans to built fourteen nuclear plants of 700 mw capacity each?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b)&(c) Yes, Sir. The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy has established the presence of 63,269 tonnes of Uranium resources (U<sub>3</sub>O<sub>8</sub>) in Tumulapalle area, Kadapa District, Andhra Pradesh upto a depth of 500 m. Another additional 39,000 tonnes are expected to be established in the adjacent unexplored areas. It is also expected that an additional deposits to the tune of 50,000 tonnes may be available between 500 m to 800 m depth as per geological continuity of the mineralized host rock. Thus, the Tumulapalle has a potential of 1,50,000 tonnes of uranium resources in 15 km. x 3 km. belt under exploration upto a depth of 800 m.
- (d) The Uranium Corporation of India Ltd. (UCIL), a Public Sector Undertaking under Department of Atomic Energy, has undertaken the construction of an underground mine and plant of 3000 tonnes per day (tpd) ore capacity which is expected to be commissioned in the year 2012. The pre-project activities for augmenting the production and processing capacity to 4500 tpd ore are in progress and expected to be commissioned in the year 2015. Further plans have been envisaged to construct a mine and a plant of 6000 tpd ore capacity (in stages) after successful commissioning of the ongoing project.

([http://www.dae.nic.in/writereaddata/rsus3877\\_080911.pdf](http://www.dae.nic.in/writereaddata/rsus3877_080911.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.3878**  
TO BE ANSWERED ON 08.09.2011

### NUCLEAR PLANTS CURRENTLY OPERATING

3878. SHRI SATISH CHANDRA MISRA:

Will the PRIME MINISTER be pleased to state:

- the details of nuclear plants that are currently operating in the country;
- the production capacity of these plants;
- the percentage efficiency of these plants; and
- in what manner the efficiency is compared with developed countries like the USA?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)&(b) There are 20 nuclear power reactors in the country with an installed capacity of 4780 MW. Out of these, 19 reactors are presently operating and one reactor, RAPS-1 (100 MW) is under extended shut down for meeting regulatory requirements. The details in this regard are as follows:

Location and State	Units	Capacity (MW)
Tarapur, Maharashtra	TAPS-1	160
	TAPS-2	160
	TAPS-3	540
	TAPS-4	540
Rawatbhata, Rajasthan	RAPS-1	100 *
	RAPS-2	200
	RAPP-3	220
	RAPS-4	220
	RAPS-5	220
	RAPS-6	220
Kalpakkam, Tamilnadu	MAPS-1	220
	MAPS-2	220
Narora, Uttar Pradesh	NAPS-1	220
	NAPS-2	220
Kakrapar, Gujarat	KAPS-1	220
	KAPS-2	220
Kaiga, Karnataka	KAIGA-1	220
	KAIGA-2	220
	KAIGA-3	220
	KAIGA-4	220

- under extended shutdown for meeting regulatory requirements.*

## Nuclear and Arms Control Centre

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- (c) The capacity utilisation (Capacity Factor) of the reactors in operation in the current year (April - July 2011) has been 78%. Of the 19 reactors in operation, 10 reactors (2840 MW) are fuelled by indigenous fuel which is not available in the required quantity. These are being operated at lower power levels matching the fuel availability and capacity factor of these reactors in the period April-July 2011 was 68%. 9 reactors (1840 MW) are fuelled by imported fuel and are being operated at their rated power. The capacity factor of these units in the period April-July 2011 has been about 93%.
- (d) The capacity factors of Indian nuclear power plants fuelled by imported fuel are comparable to those in the USA.

([http://www.dae.nic.in/writereaddata/rsus3878\\_080911.pdf](http://www.dae.nic.in/writereaddata/rsus3878_080911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.3880**  
TO BE ANSWERED ON 08.09.2011

### RARE EARTH RESERVES IN COUNTRY

3880. SHRI ANIL MADHAV DAVE:

Will the PRIME MINISTER be pleased to state:

- (a) the potential rare earth reserves in India;
- (b) the details thereof, mineral-wise;
- (c) the total production of rare earth for the last five years;
- (d) whether Government has collaborated with foreign countries/companies for processing and extraction of rare earth in India; and
- (e) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)&(b) Monazite is the principal source of rare earths in India. As per the report of Atomic Mineral Directorate for Exploration & Research (AMDER), Hyderabad, a constituent unit under the Department of Atomic Energy, the reserves of Monazite in India is about 10 million tons which translates to approx. 5 million tons of rare earth oxide.
- (c) Since, April 2004 there is no production of rare earths from Monazite source at the rare earths division of Indian Rare Earths Limited, a Public Sector Undertaking under the Department of Atomic Energy.
- (d) No, Sir.
- (e) Does not arise.

([http://www.dae.nic.in/writereaddata/rsus3880\\_080911.pdf](http://www.dae.nic.in/writereaddata/rsus3880_080911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 5542**  
TO BE ANSWERED ON 07.09.2011

### COMMONWEALTH GAMES WORK ASSIGNED TO ECIL

5542. SHRI ASADUDDIN OWAISI:

Will the PRIME MINISTER be pleased to state:

- (a) whether Electronics Corporation of India Ltd. (ECIL) was given any job during Commonwealth games;
- (b) if so, the details thereof;
- (c) whether ECIL made exorbitant profit from the job assigned for the Commonwealth games;
- (d) if so, the details thereof;
- (e) whether the Government proposes to have a special audit of the said work undertaken by ECIL;
- (f) if so, the details thereof;
- (g) whether the whole payment to ECIL has been released by the Government; and
- (h) if so, the steps taken or being taken by the Government regarding the irregularities committed by ECIL during the Commonwealth games?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) ECIL was awarded a contract for Integrated Security System on a turn-key, fixed and firm basis for CWG at a total cost of .345 crore (+taxes) covering 33 venues.
- (c)&(d) No Sir. ECIL has provided details of all expenditures incurred and has shown that profit is 30.85% of the contract value. ECIL continues to incur expenditure on this project.
- (e) CAG has already performed an audit of the CWG works, including work undertaken by ECIL.
- (f) The report has already been placed before Parliament.
- (g) No, Sir.
- (h) ECIL has not committed any irregularities in executing this contract.

([http://www.dae.nic.in/writereaddata/5542\\_lsus070911.pdf](http://www.dae.nic.in/writereaddata/5542_lsus070911.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 5567**  
TO BE ANSWERED ON 07.09.2011

### **NUCLEAR SECURITY SUMMIT**

5567. SHRI RAYAPATI SAMBASIVA RAO:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government proposes to participate in Nuclear Security Summit in Korea; and
- (b) if so, the details of the agenda for discussion in the said Summit?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)&(b) The Government proposes to participate in the Nuclear Security Summit scheduled to be held in 2012 in the Republic of Korea. The Summit will discuss issues relating to nuclear security as a follow up to the first Nuclear Security Summit held in Washington DC in April 2010.

([http://www.dae.nic.in/writereaddata/5567\\_lsus070911.pdf](http://www.dae.nic.in/writereaddata/5567_lsus070911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 5585**  
TO BE ANSWERED ON 07.09.2011

### FUEL REFINERY UNIT

5585. SHRI L. RAJA GOPAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has any proposal to set up fuel refinery unit at Adoni in Kurnool district of Andhra Pradesh;
- (b) if so, the details thereof; and
- (c) the time by which said unit is likely to be commissioned?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) No, Sir.

(b)&(c) Do not arise.

([http://www.dae.nic.in/writereaddata/5585\\_lsus070911.pdf](http://www.dae.nic.in/writereaddata/5585_lsus070911.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 5622**  
TO BE ANSWERED ON 07.09.2011

### EPR PLANTS FROM AREVA

5622. DR. JYOTI MIRDHA:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government is purchasing European Pressurized Reactor (EPR) plants from Areva, hitherto an untried reactor;
- (b) if so, the details of EPR purchased/proposed to be purchased by the Government during the last three years, country and company-wise alongwith the funds spent thereon;
- (c) the time by which these are likely to be made functional and commence power generation;
- (d) whether the Government is aware of the US Nuclear Regulatory Commission's communication to Areva that the company needs to demonstrate the effectiveness of their safety standards;
- (e) if so, the details thereof;
- (f) whether the Government concur with the views of some of the experts that this technology has been plagued with problems, is needlessly expensive and more importantly, yet to prove its efficiency; and
- (g) if so, the details thereof and the action taken/proposed to be taken by the Government in this regard?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The EPRs planned to be set up at Jaitapur in Maharashtra are of evolutionary design with several new safety features. The design of these reactors evolved from many years' operational feedback of N4 reactors in operation in France and KONVOI reactors in operation in Germany. Currently EPRs are under construction in Finland, France and China.
  - (b) Techno-commercial negotiations between Nuclear Power Corporation of India Limited (NPCIL) and AREVA, France for setting up 2 x 1650 MW EPRs at Jaitapur are in progress.
  - (c) At present pre-project activities are in progress at the site. Construction of the first phase is planned during the XII Five Year Plan. The gestation period (from first pour of concrete to commercial operation) of the EPRs is about 66 months.
- (d)&(e) On review by Nuclear Power Corporation of India Limited (NPCIL), it was found that the originally proposed computer systems needed further reinforcement to meet the regulatory requirements. Similar observations were also expressed by other regulators like USNRC (USA), STUK (Finland), HSE (UK), ASN (France). Accordingly, modifications of computer based system for Control & Instrumentation architecture in respect of EPR units to be set up at Jaitapur site will be done to meet all the safety and regulatory requirements of AERB.

## **Nuclear and Arms Control Centre**

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(f)&(g) Atomic Energy Commission (AEC) deputed an expert Committee for assessing the technology and safety aspects of EPRs. The Committee carefully examined these issues and visited the plants under construction in Finland and France. The Committee also had discussion with regulatory authorities in Finland and France. The Committee's report, placed in the AEC meeting, has clarified all doubts regarding safety and efficiency. Discussions between NPCIL and AREVA are in final stages to evolve a business model of shared scope of work so as to arrive at a viable tariff comparable to that of contemporary electricity generating plants in the region.

([http://www.dae.nic.in/writereaddata/5622\\_lsus070911.pdf](http://www.dae.nic.in/writereaddata/5622_lsus070911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 5633**  
TO BE ANSWERED ON 07.09.2011

### ATOMIC ENERGY ACT

5633. DR. RAGHUVANSH PRASAD SINGH:

Will the PRIME MINISTER be pleased to state the status of Atomic Energy Act, 2008 and the benefits accrued as a result thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

There is no Act called 'Atomic Energy Act, 2008' enacted by the Government. However, the Atomic Energy Act, originally enacted in 1948, was repealed in 1962 when the Atomic Energy Act, 1962 was enacted. Minor amendments to the Act were made in 1986 and 1987. The Department of Atomic Energy reviewed the need for amending the provisions of the Act, and action taken thereon from time to time since the beginning of the 1990's. The Department of Atomic Energy is now in the process of finalizing draft amendments to be made to the Atomic Energy Act, 1962. Atomic Energy Act, 1962 essentially provides the legal framework for development, control and use of atomic energy for the welfare of people of India and for other peaceful purposes and for matters connected therewith. The benefits accrued under Atomic Energy Act, 1962 so far are as follows: -

1. Indigenous development of nuclear power technology and nuclear fuel cycle technology.
2. Large scale application of radioisotopes in (a) Healthcare i.e. radiation, hygeinisation of medical products
  - (b) Radiopharmaceuticals for diagnostics and therapy
  - (c) Radiation treatment for cancer (teletherapy and brachytherapy)
  - (d) Nuclear agriculture: Use of radioisotopes for mutation of seeds (largely oil seeds and pulses) for improvement in yield, resistance against pest and shortening of maturity period, etc.
  - (e) Application of radioisotope for food preservation.
  - (f) Industrial applications: non-destructive testing using gamma rays, gamma scanning of petro-chemical towers, logging of oil wells, radiation processing of polymers, industrial gauging, etc.
3. Capacity building for strategic activities.

([http://www.dae.nic.in/writereaddata/5633\\_lsus070911.pdf](http://www.dae.nic.in/writereaddata/5633_lsus070911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 5643**  
TO BE ANSWERED ON 07.09.2011

### SAFETY OF JAITAPUR ATOMIC PLANT

5643. SHRI E.T. MOHAMMED BASHEER:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has reviewed the safety and security aspects of proposed Jaitapur Nuclear Power Plant in the light of nuclear accident in Fukushima, Japan;
- (b) if so, the details thereof;
- (c) the estimated nuclear waste likely to be generated per annum from the plant and the steps taken/proposed to be taken for safe disposal of the waste and also to prevent the radiation;
- (d) whether the United States Nuclear Regulatory Commission's (USNRC) concerns about the safety of the computer system in the reactor has been taken into consideration; and
- (e) if so, the details thereof and the Government's reaction thereto alongwith the follow up action taken in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)&(b) Review of safety aspects in the proposed Jaitapur Nuclear Power Plant is being carried out by Atomic Energy Regulatory Board (AERB). Atomic Energy Commission (AEC) deputed an expert Committee for assessing the technology and the safety aspects of Evolutionary Pressurized Reactors (EPRs). The Committee carefully examined these issues and visited the plants under construction in Finland and France. The Committee also had discussions with regulatory authorities in Finland and France. The Committee's report placed in the AEC meeting has clarified all doubts regarding safety and efficiency.

Subsequent to the Fukushima (Japan) incident, safety review of the EPRs is underway in France and will be further reviewed by AERB.

(c) The total volume of solid waste expected to be generated by the Jaitapur Nuclear Power Plant would be within 0.15 cu.m. per year per MW. The nuclear waste handling, treatment, storage and disposal will be as per the well laid down procedures and guidelines stipulated by the AERB.

(d)&(e) On review by Nuclear Power Corporation of India Limited (NPCIL), it was found that the originally proposed computer systems needed further reinforcement to meet the regulatory requirements. Similar observations were also expressed by other regulators like USNRC (USA), STUK (Finland), HSE (UK), ASN (France). Accordingly, modifications of computer systems for Control & Instrumentation architecture in respect of EPR units to be set up at Jaitapur site will be done to meet all the safety and regulatory requirements of AERB.

([http://www.dae.nic.in/writereaddata/5643\\_lsus070911.pdf](http://www.dae.nic.in/writereaddata/5643_lsus070911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.5666**  
TO BE ANSWERED ON 07.09.2011

### ATOMIC POWER PLANTS

5666. SHRI HARI MANJHI:

Will the PRIME MINISTER be pleased to state:

- whether the Prime Minister during his visit to Russia had signed an agreement to set up five atomic power projects in the country;
- if so, the details thereof;
- the places where these atomic power projects are likely to be set up; and
- the progress made in this regard so far?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- An agreement between Government of India and the Government of the Russian Federation on cooperation in the construction of additional nuclear power plant units at Kudankulam site as well as in the construction of Russian designed nuclear power plants at new sites in the country was signed in New Delhi on 05.12.2008 and entered into force on 15.05.2009.
- Following the agreement, Government has accorded 'in principle' approval for setting up additional nuclear power plants of Russian technology at the following sites:

Site	State	Capacity (MW)
Kudankulam	Tamilnadu	4 x 1000 *
Haripur	West Bengal	6 x 1000

*\*Two units KK 1&2 (2 x 1000 MW) are at advanced stage of commissioning at the site.*

*The units are planned to be set up in phases of 2 x 1000 MW each.*

- For setting up KK 3&4 investigations including site preparation have been completed. Environment clearance from Ministry of Environment and Forests have been obtained. The Early Works Agreement have been signed with Russian Federation and the preliminary works related to design and engineering are in progress. The detailed project proposal are being finalised for seeking administrative approval and financial sanction. Construction of the project is planned to start in the first year of XII Five Year Plan. Pre project activities have been initiated at Haripur.

([http://www.dae.nic.in/writereaddata/5666\\_lsus070911.pdf](http://www.dae.nic.in/writereaddata/5666_lsus070911.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 5672**  
TO BE ANSWERED ON 07.09.2011

### URANIUM RESERVES

5672. SHRI MANISH TEWARI:

Will the PRIME MINISTER be pleased to state:

- the number of years nuclear power generation can sustain on the uranium reserves available in the country;
- the average spending to extract one kilogram of Uranium from the ore in comparison with other countries which have Uranium reserves; and
- the details of the contracts for construction of nuclear reactors which have already been awarded and to which entity and the details of the process involved in awarding these contracts?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- The known resources of uranium in the country (about 1,00,000 tons of U<sub>3</sub>O<sub>8</sub>) were considered adequate to support a PHWR capacity of 10,000 MW for 40 years. The Atomic Minerals Directorate of Exploration and Research (AMD) have intensified its exploration efforts and the present estimated in-situ uranium resource stands at about 1,71,672 tons of U<sub>3</sub>O<sub>8</sub>.
- The average compensation price for producing 1 kg of U<sub>3</sub>O<sub>8</sub> by Uranium Corporation of India Limited (UCIL) is .18,972.00 for the year 2010-11. Data on the average spending by other countries for extracting are not available. However, the international price of Uranium varied between 45 – 130 US \$ / lb depending upon time and mode of purchase.
- Nuclear power projects in the country are set up by Nuclear Power Corporation of India Limited (NPCIL) and Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI) Public Sector Undertakings (PSUs) under the Department of Atomic Energy (DAE). NPCIL has commenced construction of two nuclear power projects – KAPP 3 & 4 (2 x 700 MW) at Kakrapar in Gujarat and RAPP 7&8 (2 x 700 MW) at Rawatbhata in Rajasthan. Details of major contracts awarded for construction of these projects were as follows:

Package	KAPP 3&4	RAPP 7&8
Civil Works	Larsen & Toubro (L&T)	Hindustan Construction Company (HCC)
Steam Generator Package	BHEL & L&T	BHEL & L&T
Turbogenerator package	BHEL Alsthom Consortium	-
Endshields	L&T	L&T
Primary Piping Package	M/s. Punj Lloyd	M/s. Punj Lloyd
Calandria	Walchandnagar Industries Limited (WIL)	WIL & Godrej

([http://www.dae.nic.in/writereaddata/5672\\_1sus070911.pdf](http://www.dae.nic.in/writereaddata/5672_1sus070911.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 5724**  
TO BE ANSWERED ON 07.09.2011

### **PER UNIT COST OF NUCLEAR POWER**

5724. SHRIMATI PRIYA DUTT:

Will the PRIME MINISTER be pleased to state:

- (a) the per unit cost of nuclear power produced in the country;
- (b) whether India is being treated as one of the most desired destinations for the nuclear suppliers; and
- (c) if so, the details thereof?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The present tariff of electricity generated by nuclear power per unit ranges from 94 paise in case of the first nuclear power station (TAPS 1&2 at Tarapur in Maharashtra) to 304 paise in case of the latest station (KGS 3&4 at Kaiga in Karnataka).
- (b)&(c) India's energy resources are limited and the energy demand is huge and rapidly growing. In the Indian scenario, all sources of electricity generation need to be deployed optimally. Given India's energy resource profile, nuclear power is an important clean energy option for long term energy security and sustainability. Considering India's large nuclear power expansion plans, nuclear suppliers, are interested in technical cooperation with Nuclear Power Corporation of India Limited (NPCIL) for setting up of nuclear power stations.

([http://www.dae.nic.in/writereaddata/5724\\_lsus070911.pdf](http://www.dae.nic.in/writereaddata/5724_lsus070911.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO. 336**  
TO BE ANSWERED ON 25.08.2011

### RADIATION EXPOSURE IN KAKRAPARA ATOMIC PLANT

\*336 SHRI SATYAVRAT CHATURVEDI:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that four employees working at atomic plant in Kakrapara, Gujarat were exposed to radiation on 30 May, 2011;
- (b) if so, the reasons therefor;
- (c) the nature and extent of the injuries/loss of health caused to the employees by the radiation; and
- (d) whether any effective steps have been taken to avoid such incidents in the future?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)to(d) A statement is laid on the Table of the House

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION  
NO. 336 FOR ANSWER ON 25.08.2011 BY SHRI MOTILAL VORA AND SHRI  
SATYAVRAT CHATURVEDI REGARDING RADIATION EXPOSURE IN KAKRAPARA  
ATOMIC PLANT

- (a) Yes, Sir. Four workers of a contractor were exposed to radiation at Kakrapar Atomic Power Station on May 30, 2011.
- (b) Kakrapar Atomic Power Station comprises of two units of 220 MW Pressurised Heavy Water Reactors. The re-fuelling in these reactors is carried out daily using remotely operated fuelling machines. The spent fuel bundles discharged from the reactor are transferred to spent fuel storage bay through a transfer duct. The radiation field in the area around the duct (which is well shielded) increases during transfer of spent fuel. On May 30, 2011, seven contract workers were deployed to carry out painting work in the area around the duct and the fuel discharge operations through the duct was kept on hold. However, inadvertently, a fuel discharge operation was initiated resulting in increased radiation field, leading to radiation exposure of four workers.
- (c) Monitoring instruments provided to these workers indicated radiation exposure in the range of 23.23 mSv to 90.77 mSv. The regulatory limit for radiation exposure for occupational workers is 20 mSv in a year and for contract workers 15 mSv in a year. However, the level of exposure of workers is significantly lower than what can cause any adverse health effects. The comprehensive medical checkup of the workers has been carried out and no adverse effects have been detected. The workers are continuing to perform their normal duties in areas away from radiation.



## **Nuclear and Arms Control Centre**

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- (d) Following the incident, interlock procedure has been instituted to ensure no entry in the surrounding area during movement of spent fuel through duct. Further, the operating officials responsible for the incident have been shifted out of charge holding responsibility and sent for re-training.

([http://www.dae.nic.in/writereaddata/rssq336\\_250811.pdf](http://www.dae.nic.in/writereaddata/rssq336_250811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2482**  
TO BE ANSWERED ON 25.08.2011

### FUNDS SPENT ON DEVELOPING THORIUM

2482. SHRI SHREEGOPAL VYAS:

Will the PRIME MINISTER be pleased to state:

- (a) the amount spent for developing Thorium available in India as a source of atomic energy in the last five years;
- (b) the number of people engaged in this work, place-wise; and
- (c) the achievement till now and the likely quantum of energy that can be attained by this in the next ten years?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The development of thorium as fuel for producing atomic energy involves several R&D activities in the fields of mining and extraction of thorium, fuel fabrication, irradiation in reactors, reprocessing to extract valuable elements, re-fabrication of fuel, clean-up etc. The Department of Atomic Energy has been engaged in such R&D activities for the last several years, even though for many of them dedicated facilities have not been necessarily created and such work is done as a part of other ongoing activities. During the last five years, the amount spent on chemical processing and clean-up activities was around ` 120 Crore.

Apart from the above, other major activity has been the design and development of Advanced Heavy Water Reactor (AHWR). This reactor can use a variety of fuel types, including thorium based fuel, for which its design has been optimised. In so far as use of thorium is concerned, the input to the reactor design is in the form of reactor physics computation and has not added much to the cost. The reactor design addresses substantial technology development towards advanced passive safety features as needed for large scale deployment of nuclear energy in a densely populated country like India, in the future.

- (b) R&D teams dedicated solely for thorium related development have not been formed. The related R&D activities are generally carried out by groups which are already involved in carrying out similar R&D activities for different types of fuels and are therefore only partly engaged for thorium related programmes.
- (c) Achievements:
  - Thorium fuel fabrication through powder pellet route has been well established. Few tons of fuel have been made for CIRUS and Dhruva, PHWR and for blanket assemblies for FBTR. Few pins have been fabricated using mixed oxides of (Th-Pu) for irradiation in research reactors.
  - Thoria bundles are used in the initial cores of PHWR. The irradiation experience of thoria fuel in the research reactors CIRUS and Dhruva, PHWR and test irradiations are satisfactory.

## Nuclear and Arms Control Centre

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- The thoria pins of CIRUS have been reprocessed to obtain U233. The recovered U233 has been fabricated as fuel for KAMINI reactor at Kalpakkam. The Post Irradiation Examination of one of the thoria bundle irradiated in PHWR has also been carried out for validation of theoretical analyses.
- Studies have been carried out regarding use of thorium in different types of reactors with respect to fuel management, reactor control and fuel utilisation.
- To accelerate thorium utilisation, BARC has designed an Advanced Heavy Water Reactor (AHWR). This reactor will demonstrate various aspects of thorium fuel technology.
- A Critical Facility for Advanced Heavy Water Reactor has been commissioned in 2008 and is being used for carrying out experiments to further validate the physics design features of Advanced Heavy Water Reactor.

Likely quantum of energy that can be attained by this in the next 10 years:

BARC has designed a 300 MWe AHWR which is specially meant for large scale commercial utilization of thorium, generating nearly 70% of its power from insitu burnup of thorium. The design of all nuclear systems of the reactor has been completed and associated confirmatory R&D is in a very advanced stage.

Detailed engineering of AHWR is currently in progress and construction of this reactor can begin once the necessary site selection has been done and associated statutory and regulatory clearances are obtained.

As a part of the Indian strategy, large scale deployment of Thorium is to be introduced only at an optimal point during operation of Fast Breeder Reactors in the second stage. Thorium, for power generation, will be used mainly in the third stage. During the next ten years, the power generated using thorium will reach a maximum of 300 MWe, provided AHWR, a technology demonstrator, gets operational during this period.

([http://www.dae.nic.in/writereaddata/rsus2482\\_250811.pdf](http://www.dae.nic.in/writereaddata/rsus2482_250811.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2483**  
TO BE ANSWERED ON 25.08.2011

### URANIUM MINE IN ANDHRA PRADESH

2483. SHRI T.M. SELVAGANAPATHI:

Will the PRIME MINISTER be pleased to state:

- whether the Department had discovered a huge reserve of Uranium in the State of Andhra Pradesh;
- if so, the details thereof;
- whether it took more than four years to discover this huge deposits of Uranium; and
- if so, the reasons for the long duration it took to discover this huge deposit of Uranium?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- Yes, Sir.
- The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy, has so far established 83,538 tonnes of uranium resources ( $U_3O_8$ ) in Andhra Pradesh. The details of the same are as given below:

NAME OF THE DEPOSIT	URANIUM RESOURCES ESTABLISHED (TONNES $U_3O_8$ )
LAMBAPUR	1,450
PEDDAGATTU	7,585
TUMMALAPALLE – RACHAKUNTAPALLE	63,269
KOPPUNURU	2,761
CHITRIAL	8,473
SUB-TOTAL	83,538

[ 1 TONNE OF  $U_3O_8$  = 0.848 TONNES OF URANIUM METAL ]

- Yes, Sir.
- AMD has been carrying out exploration in Tumallapalle area since the year 1986. Initially, it was observed that the recovery was not economical by conventional acid leaching techniques due to carbonate rocks formation. However, further R&D efforts carried out in establishing effective leaching techniques enabled commencement of 2nd phase of exploration in the year 2007. The Uranium Corporation of India Ltd. (UCIL), a Public Sector Undertaking of this Department is currently undertaking construction of mine and mill at Tumallapalle for exploitation and processing of the uranium ore.

The time taken for opening of the mine and setting up of the mineral processing plant is reasonable.

([http://www.dae.nic.in/writereaddata/rsus2483\\_250811.pdf](http://www.dae.nic.in/writereaddata/rsus2483_250811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2484**  
TO BE ANSWERED ON 25.08.2011

### SAFETY ASSESSMENT OF KAIGA NUCLEAR PLANT

2484. SHRI RAJEEV CHANDRASEKHAR:

Will the PRIME MINISTER be pleased to state:

- (a) whether Government has undertaken any study on safety of nuclear plants in India;
- (b) if so, the details thereof;
- (c) the safety assessment of the Kaiga Plant in Karnataka; and
- (d) the measures that have been put in place by Government to ensure safety of this plant?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) Yes, Sir.

(b) Soon after the Fukushima (Japan) incident, the Government directed a comprehensive review of safety of all the nuclear power reactors in the country. In line with this directive, Nuclear Power Corporation of India Limited (NPCIL) constituted four task forces for each of the technology in operation and two task forces for the two types of reactors under construction. These task forces have revisited the safety aspects of all the nuclear power plants and found that Indian nuclear power reactors are safe and have sufficient margins and features in the design to withstand extreme natural events. The reports of the task forces have been submitted and made public. The Atomic Energy Regulatory Board (AERB) and Bhabha Atomic Research Centre (BARC) have also constituted committees whose reports are expected in the near future.

(c)&(d) The Kaiga Generating Station in Karnataka was found to be safe and having sufficient margins and features in the design to withstand extreme natural events. However, to further enhance its safety, recommendations have been made which are being implemented after due process of approval. These, inter-alia, are:

- Automatic reactor shutdown initiation sensing seismic activity.
- Augmentation of cooling water inventories and provisions for additional hook up arrangements through external sources and provision of mobile diesel driven pump sets.
- Increasing the duration of the passive power sources / battery operated devices for monitoring important parameters for a longer duration, and
- Revision of Emergency Operating Procedures (EOPs) and structured training programs to train plant personnel on modified EOPs.

([http://www.dae.nic.in/writereaddata/rsus2484\\_250811.pdf](http://www.dae.nic.in/writereaddata/rsus2484_250811.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2485**  
TO BE ANSWERED ON 25.08.2011

### **WITHDRAWAL OF GERMAN BANK FROM FINANCING OF ATOMIC PLANT**

2485. SHRI RAJKUMAR DHOOT:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that a German bank which was to finance the controversial atomic power plant at Jaitapur in Maharashtra has withdrawn from the power plant;
- (b) if so, the details thereof;
- (c) the reasons cited by the German bank for its withdrawal from the proposed power plant; and
- (d) the action taken by Government in this regard?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) &(b) In January, 2009, an Expression of Interest was called from 50 international bankers for part financing the proposed Jaitapur Nuclear Power Plant in Maharashtra. No German bank responded to that. Hence, the question of withdrawal by a German bank does not arise.

(c)&(d) Do not arise.

([http://www.dae.nic.in/writereaddata/rsus2485\\_250811.pdf](http://www.dae.nic.in/writereaddata/rsus2485_250811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.2486**  
TO BE ANSWERED ON 25.08.2011

### RADIATION EXPOSURE IN KAKRAPAR ATOMIC POWER STATION

2486. SHRI KANJIBHAI PATEL:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that four daily wage labourers at Kakrapar Atomic Power Station in Gujarat were exposed to radiation in last week of July, 2011;
- (b) if so, the details thereof;
- (c) the actions that have been initiated on the responsible employees;
- (d) whether any cross medical check-up of the victims has been done;
- (e) if so, the result thereof and if not, the reasons therefor;
- (f) whether the victims requested for permanent jobs in the Power Station; and
- (g) if so, the actions being taken to give them permanent job?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)&(b) Four workers employed by a contractor were exposed to radiation on May 30, 2011 in Kakrapar Atomic Power Station (KAPS). This happened due to a fuel discharge operation initiated inadvertently. The radiation exposure of the workers was in the range of 23.23 mSv to 90.77 mSv.
- (c) The operating officials who were responsible for the incident have been shifted from charge holding responsibility and sent for re-training.
- (d)&(e) Yes, Sir. The comprehensive medical check-up of these workers has been done. It does not show any adverse effect on their health.
- (f)&(g) These workers continue to be employed by the contractor at the station in non radiation areas.

([http://www.dae.nic.in/writereaddata/rsus2486\\_250811.pdf](http://www.dae.nic.in/writereaddata/rsus2486_250811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 301**  
TO BE ANSWERED ON 24.08.2011

### NUCLEAR SAFETY

\* 301 SHRI BHUDEO CHOUDHARY:

SHRI RAYAPATI SAMBASIVA RAO:

Will the PRIME MINISTER be pleased to state:

- (a) the details of the shore protection measures put in place in respect of the atomic power stations located near the sea coast;
- (b) whether the Government is equipped with the latest equipment to check the radiation leakage from the atomic plants;
- (c) if so, the details thereof and if not, the action contemplated in this regard;
- (d) whether the recommendations made by the task forces set up by the Nuclear Power Corporation of India Limited (NPCIL) have been accepted; and
- (e) if so, the details thereof and the follow-up action taken by the Government on the same?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND  
IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) to (e) A statement is laid on the Table of the House

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STATEMENT REFERRED IN REPLY TO LOK SABHA STARRED QUESTION NO.301 BY  
SHRI BHUDEO CHOUDHARY AND SHRI RAYAPATI SAMBASIVA RAO REGARDING  
NUCLEAR SAFETY FOR ANSWER ON 24.08.2011

- (a) Atomic power stations in coastal areas are designed taking into account the technical parameters related to earthquake, Tsunami, storm surges, wave run up, floods, tides etc. Plants are, therefore, equipped with facilities to handle such design basis eventualities. The shore protection measures also include construction of civil structures like break waters, bunds, etc. to minimize the effect of some of these natural events.

(b) Yes sir.

- (c) These include area radiation monitors located inside and outside the reactor and auxiliary buildings. The radiation monitoring is also done through Environmental Survey Laboratories established to monitor various radiation related parameters in air, water, soil, crops, fish, meat etc. upto 30 kms. around.

- (d)&(e) Recommendations of the Task Force relating to augmentation of existing provisions for e.g. hook-up arrangements through external sources for addition of cooling water to primary heat transport system and steam generators; increasing the duration of passive power sources / battery operated devices for monitoring important parameters for a longer duration; augmentation of water inventory; additional shore protection measures are under implementation. In respect of the recommendations relating to automatic shutdown on sensing seismic activity; inerting of TAPS-1&2 containment etc., the matter is being taken up with regulatory authority for clearance / approval.

([http://www.dae.nic.in/writereaddata/lssq301\\_240811.pdf](http://www.dae.nic.in/writereaddata/lssq301_240811.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 306**  
TO BE ANSWERED ON 24.08.2011

### ATOMIC ENERGY GENERATION

\* 306 SHRI RAMSINH RATHWA:

SHRI P.K. BIJU:

Will the PRIME MINISTER be pleased to state:

- (a) whether some of the atomic power plants are not generating nuclear power as per their capacity;
- (b) if so, the details thereof, plant-wise and the reasons therefor;
- (c) the nuclear power generated by these plants during each of the last three years and the current year vis-a-vis their generation capacity, plant-wise; and
- (d) the steps taken/proposed to be taken by the Government to increase the power generation from these plants to meet the increasing demand of power in the country?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) to (d) A statement is laid on the Table of the House

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STATEMENT REFERRED IN REPLY TO LOK SABHA STARRED QUESTION NO.306  
BY SHRI RAMSINH RATHWA AND SHRI P.K. BIJU REGARDING ATOMIC ENERGY  
GENERATION FOR ANSWER ON 24.08.2011

- (a)&(b) Out of 20 nuclear power reactors with the installed capacity of 4780 MW, 19 reactors are in operation. One reactor (first PHWR , RAPS-1) is under extended shut down condition to meet regulatory requirements. Ten reactors with a capacity of 2840 MW comprising KGS 1 to 4 (4 x 220 MW), NAPS 1&2 (2 x 220 MW), MAPS 1&2 (2 x 220 MW) and TAPS 3 &4 (2 x 540 MW) are fuelled by indigenous fuel, which is not available in the required quantity. These are, accordingly, being operated at lower power levels matching the fuel supply. The remaining 9 reactors which are under International Atomic Energy Agency (IAEA) safeguards use imported fuel. These reactors are operating at rated capacity.
  - (c) The details are given in the annexure.
  - (d) The Government is making efforts to augment domestic fuel supplies by opening new mines and processing facilities. The efforts of the Government have resulted in improvement of domestic fuel supplies from the year 2009-10 onwards.
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## Nuclear and Arms Control Centre

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**ANNEXURE REFERRED IN ANSWER TO PART (C) OF LOK SABHA STARRED  
QUESTION NO.306 FOR ANSWER ON 24.08.2011**

Units	Capacity MW	Generation in Million Units			
		2008-09	2009-10	2010-11	2011-12 Till July 2011
TAPS-3	540	1922	2787	3582	1551
TAPS-4	540	2030	2754	3124	875
MAPS-1	220	732	938	1260	312
MAPS-2	220	785	1108	980	427
NAPS-1	220	740	818	1228	407
NAPS-2	220	0	0	658	236
KAIGA-1	220	1157	1011	1259	461
KAIGA-2	220	1079	1111	988	443
KAIGA-3	220	452	1112	1334	403
KAIGA-4	220	-	-	295	562

([http://www.dae.nic.in/writereaddata/lssq306\\_240811.pdf](http://www.dae.nic.in/writereaddata/lssq306_240811.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 315**  
TO BE ANSWERED ON 24.08.2011

### REPROCESSING CAPACITY

\* 315. SHRI M.B. RAJESH:

SHRI P. KUMAR:

Will the PRIME MINISTER be pleased to state:

- the details of the nuclear plants having reprocessing/recycling of nuclear waste/spent fuel facilities, plant-wise and State-wise;
- whether the Government has made any estimate of reprocessing capacity required in the near future to handle nuclear waste/spent fuel generated in the country;
- if so, the details thereof and the steps taken/proposed to be taken to enhance the indigenous reprocessing/recycling capacity of nuclear plants as per requirement;
- whether the Government has already increased the reprocessing/recycling capacity of some of the nuclear plants including the Tarapur Nuclear Power Plant;
- if so, the details thereof, plant-wise and State-wise;
- whether any foreign country has offered to extend technical assistance in handling nuclear waste; and
- if so, the details thereof, country wise and the response of the Government thereto?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) to (g) A statement is laid on the Table of the House

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STATEMENT REFERRED IN REPLY TO LOK SABHA STARRED QUESTION NO.315  
BY SHRI M.B. RAJESH AND SHRI P.KUMAR REGARDING REPROCESSING  
CAPACITY FOR ANSWER ON 24.08.2011

(a) As on date, nuclear spent fuel reprocessing/waste management plants are located at the following sites:

S. No.	Name of site	Details of plants in operation
1.	Trombay, Maharashtra	(a) A Plutonium Plant for reprocessing of Research Reactor metallic fuel. (b) A Waste Management Plant.
2.	Tarapur, Maharashtra	(a) Power Reactor Spent Fuel Reprocessing Plants-PREFRE 1&2. (b) Waste Management Facilities of matching capacity to handle the Waste from the above plants.
3.	Kalpakkam, Tamilnadu	(a) Kalpakkam Reprocessing Plant (KARP) for reprocessing the spent fuel from Pressurized Heavy Water Reactors (PHWRs). (b) Centralized Waste Management Facility (CWMF) for managing the waste from KARP and other facilities at Kalpakkam.

([http://www.dae.nic.in/writereaddata/lssq315\\_240811.pdf](http://www.dae.nic.in/writereaddata/lssq315_240811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3601**  
TO BE ANSWERED ON 24.08.2011

### URANIUM RESERVES

3601. DR. MURLI MANOHAR JOSHI:

SHRI S. SEMMALAI:

SHRI L. RAJA GOPAL:

SHRI SYED SHAHNAWAZ HUSSAIN:

SHRI DINESH CHANDRA YADAV:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has identified the high value uranium reserves in various parts of the country;
- (b) if so, the quantum of uranium reserves found in the country location-wise and State-wise;
- (c) the expenditure incurred by the Government on the said exploration and other works during the last three years and the current year alongwith the details of such exploration work carried out; State-wise;
- (d) the revenue likely to be generated from the said reserves;
- (e) whether the Government proposes to open new mines and setting up of new processing plants;
- (f) if so, the details thereof; and
- (g) the percentage of uranium likely to be imported by the country to meet the production targets of atomic energy at present?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy has established the presence of 1,71,672 tonnes of Uranium ( $U_3O_8$ ) as on 30.06.2011. The location-wise and state-wise details of the uranium resources are as under:

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STATE	NAME OF THE DEPOSIT (LOCATION)	URANIUM RESOURCES ESTABLISHED (IN METRIC TONNES U3O8)
ANDHRA PRADESH	LAMBAPUR	63269
	PEDDAGATTU	83538
	TUMMALAPALLE - RACHAKUNTAPALLE	10700
	KOPPUNURU	1450
	CHITRIAL	7585
	SUB-TOTAL	2761
CHHATTISGARH	BODAL	8473
	JAJAWAL	1530
	DHUMATH-DHABI	1438
	BHANDARITOLA	500
	SUB-TOTAL	518
HIMACHAL PRADESH	RAJPURA	3986
	KASHA-KALADI	364
	TILELI	200
	SUB-TOTAL	220
JHARKHAND	JADUGUDA	784
	JADUGUDA EXTENSION	5100
	BHATIN	1600
	NARWAPAHAR	1150
	NARWAPAHAR EXTENSION	1080
	TURAMDIH	3750
	BANDUHURAN	5460
	BAGJATA	1860
	MOHULDIH	1700
	MOHULDIH EXTENSION	1630
	TURAMDIH (SOUTH)	4850
	GARADIH	1270
	KANYALUKA	1970
	NIMDIH	815
	RAJGAON	1200
	NANDUP	2910
	CENTRAL KERUADUNGRI	1029
	SINGRIDUNGRI-BANADUNGRI	1764
	BANGURDIH	1140
SUB-TOTAL	50978	
KARNATAKA	GOGI	4267
	WALKUNJI-YELLAKKI	415
	SUB-TOTAL	4682
MAHARASHTRA	MOGARRA	355
	SUB-TOTAL	355

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MEGHALAYA	KPM (DOMIASIAT)	9500
	WAHKYN	5381
	GOMAGHAT- PHLANGDILOIN	1000
	TYRNAI	600
	LOSTOIN	771
	WAHKUT	1161
	UMTHONGKUT	753
	SUB-TOTAL	19738
RAJASTHAN	ROHIL	5566
	UMRA	1160
	SUB-TOTAL	6726
UTTAR PRADESH	NAKTU	785
	SUB-TOTAL	785
UTTARAKHAND	POKHRI-TUNJI	100
	SUB-TOTAL	100
	GRAND TOTAL	1,71,672

[ 1 tonne of U3O8 = 0.848 tonnes of uranium metal ]

(c) The details of expenditure incurred during the last three years on uranium exploration under Plan and Non-Plan are as follows:

Sector	FY 2008 – 09	FY 2009 – 10	FY 2010 - 11
Plan	93.82	114.86	115.52
Non-Plan	99.72	143.28	137.10
Total	193.54	258.14	252.62

The exploration is carried out depending upon the geological set up of the area and due to geological continuity, the areas in contiguous two states are covered / explored.

Therefore, the state-wise expenditure is not considered for a particular activity of exploration.

The uranium reserves established by AMD are exploited by the Uranium Corporation of

(d) India Ltd. (UCIL), a Public Sector Undertaking of this Department through mining and milling process. Thereafter, the Nuclear Fuel Complex (NFC), a constituent Unit of the Department fabricates the fuel to be used in the nuclear power stations for indigenous power generation by the Nuclear Power Corporation of India Ltd. (NPCIL), a Public Sector Undertaking of the Department of Atomic Energy. Therefore, no direct revenues will be generated from the Uranium reserves; but the reserves will enable operation of nuclear power reactors and generation of electricity.

(e) Yes, Sir.

The UCIL is presently operating five underground mines (viz. Jaduguda, Bhatin,

## Nuclear and Arms Control Centre

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(f) Narwapahar, Turamdih and Bagjata), one open cast mine (Banduhurang) and two Processing Plants (Jaduguda and Turamdih) in East Singhbhum District and one underground mine at Mohuldih is under construction at Saraikela Kharswan District (all in Jharkhand State). An underground mine and ore processing plant at Tummalapalle (Tummalapalle Uranium Project) in Andhra Pradesh with a capacity to process 3000 tonnes per day (tpd) ore is in advanced stage of construction. An underground mine and process plant at Gogi in Yadgir District of Karnataka is under pre-project stage. Required quantities of Uranium is being presently imported under agreements with

(g) other countries, for utilization in 10 nuclear reactors which are under safeguards. Besides, these imports also help in stockpiling of Uranium for future use.

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([http://www.dae.nic.in/writereaddata/3601\\_lsus240811.pdf](http://www.dae.nic.in/writereaddata/3601_lsus240811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3620**  
TO BE ANSWERED ON 24.08.2011

### EXPORT OF NUCLEAR REACTORS

3620. SHRI NAVEEN JINDAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government proposes to export nuclear reactors;
- (b) if so, the details of the countries to which these reactors are likely to be exported along with the foreign exchange likely to be earned therefrom;
- (c) whether the Government is able to meet its own future requirement of these reactors; and
- (d) if not, the reasons for the said export?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) Preliminary discussions in this regard are in progress with Kazakhstan. The details of foreign exchange likely to be earned will be known only if proposals in this regard take final shape.
- (c) The future requirements of these reactors can be met indigenously from Indian industries both in the public and private sector.
- (d) Does not arise.

([http://www.dae.nic.in/writereaddata/3620\\_lsus240811.pdf](http://www.dae.nic.in/writereaddata/3620_lsus240811.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3622**  
TO BE ANSWERED ON 24.08.2011

### NUCLEAR REACTORS

3622. SHRI S.S. RAMASUBBU:

Will the PRIME MINISTER be pleased to state:

- (a) the number and details of nuclear reactors so far built in the country indigenously;
- (b) whether the Government has any proposal to build more nuclear reactors with the cooperation of Russia;
- (c) if so, the details and the estimated capacity thereof; and
- (d) the time by which the new reactors are likely to be made operational?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The first pair of nuclear power reactors in the country - TAPS 1&2 were set up on turnkey basis by General Electric (GE), USA and the construction of the next twin reactors RAPS 1&2 was started in technical cooperation with AECL, Canada. After 1974, peaceful nuclear experiment in India, Canadians left the project and Indian engineers completed the construction of these reactors. Subsequently, 16 nuclear power reactors have been set up indigenously. The details are attached.
- (b) Yes, Sir.
- (c) Units 1&2 of Kudankulam Nuclear Power Plant (KKNPP-1&2) of 1000 MW each, being set up in technical co-operation with Russian Federation at Kudankulam in Tamilnadu, are at advanced stage of commissioning. In addition, the Government has accorded 'in principle' approval of sites at Kudankulam for additional capacity of 4 x 1000 MW and Haripur in West Bengal for 6 x 1000 MW for setting up nuclear power reactors in technical cooperation with Russian Federation. These reactors are planned to be set up in phases of two reactors at a time.
- (d) The KKNPP Units 3&4 are planned to be taken up towards end of XI Plan. The projects will be operational in about six years from the actual start of work. The next phase is planned after an interval of 3 to 4 years.

([http://www.dae.nic.in/writereaddata/3622\\_lsus240811.pdf](http://www.dae.nic.in/writereaddata/3622_lsus240811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3636**  
TO BE ANSWERED ON 24.08.2011

### MEDICAL TREATMENT OF BHOPAL GAS VICTIMS

3636. SHRI RUDRA MADHAB RAY:

Will the PRIME MINISTER be pleased to state:

- (a) whether Bhopal gas victims are being discouraged/denied medical treatment by Bhopal Memorial Hospital and Research Centre (BMHRC) whereas other patients are being extended the said facility;
- (b) if so, the facts thereof and the number of cases of gas victim registered so far;
- (c) the action taken against the guilty officials for not making medical facilities available to such persons; and
- (d) the steps taken/being taken by the Government to provide full medical facilities to gas victims?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

a) No, Sir. The non-gas victims are given treatment in BMHRC on payment basis, whereas the gas victims are treated free. No gas victim has been denied treatment as a result of the policy of providing treatment to non-gas victims on payment basis.

b) The number of gas victims registered till date in BMHRC is 3.77 lakh.

(c)&(d) Does not arise in view of reply at (a) above.

([http://www.dae.nic.in/writereaddata/3636\\_lsus240811.pdf](http://www.dae.nic.in/writereaddata/3636_lsus240811.pdf))

## Nuclear and Arms Control Centre

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Ministry of External Affairs  
LOK SABHA  
UNSTARRED QUESTION NO.3530  
TO BE ANSWERED ON 24.08.2011

SHRI PRABODH PANDA:

### PAK NUCLEAR ARSENALS

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the Government's attention has been drawn to the statement issued by a nuclear physicist of Pakistan that his country is not capable of keeping nuclear weapons safe;
- (b) if so, the details thereof and the reaction of the Government thereto;
- (c) whether the Government is considering to take the issue with international nuclear forum so that the Pak nuclear arsenals do not fall into wrong hands;
- (d) if so, the details thereof; and
- (e) the details of the Government's plan for security of the country in that eventuality?

### ANSWER

THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS (SMT. PRENEET KAUR)

(a) to (e) Government has seen reports regarding the safety of Pakistani nuclear weapons. Government hopes that the Government of Pakistan will continue to take steps for securing its nuclear assets. In the context of international discussions on nuclear security matters, India has raised concerns regarding the danger of nuclear explosives or fissile material falling into the hands of non-state actors and terrorists. Government monitors all developments having a bearing on national security and takes all necessary steps to safeguard it.

(a) Government has seen reports about transfer of Pakistani nuclear items.

(b) & (c) Government has highlighted the role of clandestine proliferation activities in international fora from time to time.

(<http://meaindia.nic.in/mystart.php?id=100518176>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO. 259**  
TO BE ANSWERED ON 18.08.2011

### STATUS OF THE ATOMIC ENERGY ACT, 2008

\*259. SHRI RAM KRIPAL YADAV:

Will the PRIME MINISTER be pleased to state:

- (a) the status of the Atomic Energy Act, 2008;
- (b) the details of benefits availed under this act so far;

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND  
IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a)&(b) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION NO.259  
FOR ANSWER ON 18.8.2011 BY SHRI RAM KRIPAL YADAV REGARDING STATUS OF THE  
ATOMIC ENERGY ACT, 2008

(a)&(b) There is no Act called 'Atomic Energy Act, 2008' enacted by the Government. However, the Atomic Energy Act, originally enacted in 1948, was repealed in 1962 when the Atomic Energy Act, 1962 was enacted. Minor amendments to the Act were made in 1986 and 1987. The Department of Atomic Energy reviewed the need for amending the provisions of the Act, and action taken thereon from time to time since the beginning of the 1990's. The Department of Atomic Energy is now in the process of finalizing draft amendments to be made to the Atomic Energy Act, 1962. Atomic Energy Act, 1962 essentially provides the legal framework for development, control and use of atomic energy for the welfare of people of India and for other peaceful purposes and for matters connected therewith. The benefits availed under Atomic Energy Act, 1962 so far are as follows: -

1. Indigenous development of nuclear power technology and nuclear fuel cycle technology.
  2. Large scale application of radioisotopes in a. Healthcare i.e. radiation, hygeinisation of medical products
  - b. Radiopharmaceuticals for diagnostics and therapy
  - c. Radiation treatment for cancer (teletherapy and brachytherapy)
  - d. Nuclear agriculture: Use of radioisotopes for mutation of seeds (largely oil seeds and pulses) for improvement in yield, resistance against pest and shortening of maturity period, etc.
  - e. Application of radioisotope for food preservation.
  - f. Industrial applications: non-destructive testing using gamma rays, gamma scanning of petro-chemical towers, logging of oil wells, radiation processing of polymers, industrial gauging, etc.
3. Capacity building for strategic activities.

([http://www.dae.nic.in/writereaddata/rssq259\\_180811.pdf](http://www.dae.nic.in/writereaddata/rssq259_180811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1861**  
TO BE ANSWERED ON 18.08.2011

### ADVANCEMENT IN NUCLEAR ENERGY PARTNERSHIP

1861. SHRIMATI RENUBALA PRADHAN:

Will the PRIME MINISTER be pleased to state:

- (a) to what extent India advanced in setting up Global Centre for nuclear energy partnership;
- (b) the partner countries with whom India has decided to have a partnership in the field;
- (c) whether those countries are good enough in the development of proliferation resistant reactor technologies, nuclear security technologies, radiology safety and radiation technology application; and
- (d) if so, the credentials of those countries in those fields in arresting related problems in these areas so far?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Global Centre for Nuclear Energy Partnership is proposed to be set up in Haryana. Land for this purpose has been identified and payment has also been made to Govt. of Haryana. Plans for the Centre have been made and to firm up the site plans steps for finalizing architectural consultant are being taken.
- (b) India has, so far, signed co-operation agreements on Global Centre for Nuclear Energy Partnership with France, Russia, and USA.
- (c) Yes, Sir.
- (d) Concepts of Proliferation Resistant Reactor Technologies are being examined by the above countries. In India, the development of Advanced Heavy Water Reactor and its associated Fuel Cycle using Thorium has a bearing on their intrinsic proliferation resistance.

([http://www.dae.nic.in/writereaddata/rsus1861\\_180811.pdf](http://www.dae.nic.in/writereaddata/rsus1861_180811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1862**  
TO BE ANSWERED ON 18.08.2011

### FUNCTIONAL URANIUM MINES IN INDIA

1862. SHRIMATI BRINDA KARAT:

Will the PRIME MINISTER be pleased to state:

- (a) the total number of Uranium mines that have been functional in India;
- (b) Whether such Uranium mining have caused any health related hazards in any part of mining areas;
- (c) If so, the steps Government of India has undertaken to provide safety to the inhabitants near Uranium mining; and
- (d) the details thereof ?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Uranium Corporation of India Limited (UCIL), a Public Sector Undertaking under the Department of Atomic Energy (DAE) for carrying out the mining and processing of Uranium minerals, is presently operating five underground Uranium mines at Jaduguda, Bhatin, Narwapahar, Turamdih & Bagjata and one opencast mine at Banduhurang all in East Singhbhum District of Jharkhand State.
- (b) No, Sir.
- (c)&(d) Does not arise in view of reply to (b) above. However, the operations of UCIL are carried out under strict surveillance of Atomic Energy Regulatory Board (AERB), State Pollution Control Board and Director General of Mines & Safety (DGMS). UCIL has a track record of adopting absolute safe and environment friendly working practices in uranium mining and processing activities as prescribed by AERB. Radiation monitoring is carried out by Environmental Survey Laboratory, Bhabha Atomic Research Centre (BARC) in all mines and neighbouring areas in a systematic manner. Results of radiation monitoring are subjected to inspection by AERB. Periodical medical check ups of the employees are done as per approved schedule. A full-fledged Environmental Survey Laboratory cum Health Physics Unit – an independent body under the administrative control of BARC is in operation since inception of the mines and related facilities to carry out environmental and radiological surveillance in and around UCIL's units. The reports of the survey are reviewed by AERB through its various constituents. UCIL provides comprehensive health care to all persons employed in mine and their families.

([http://www.dae.nic.in/writereaddata/rsus1862\\_180811.pdf](http://www.dae.nic.in/writereaddata/rsus1862_180811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1863**  
TO BE ANSWERED ON 18.08.2011

### PREPAREDNESS OF ATOMIC PLANTS TO WITHSTAND DISASTER

1863. DR. K.V.P RAMACHANDRA RAO:

Will the PRIME MINISTER be pleased to state:

- (a) whether Indian atomic plants can withstand any disasters, both manmade and natural, particularly in the light of the recent disaster that took place in Japan;
- (b) if so, the preparedness of the plants in India; and
- (c) further steps that are proposed to be taken in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND  
IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) The nuclear power plants are sited, designed, constructed and operated to be safe in the event of any natural and man induced events. In the light of the recent incidents at Fukushima in Japan, Nuclear Power Corporation of India Limited (NPCIL) constituted four task forces for different technologies in operation. These task forces have revisited the safety of all the nuclear power plants and found that Indian nuclear power reactors are safe and have sufficient margins and features in the design to withstand extreme natural events. The reports of the task forces have been submitted and made public. The Atomic Energy Regulatory Board (AERB) and Bhabha Atomic Research Centre (BARC) have also constituted committees whose reports are expected in the near future.
- (c) To further enhance the safety of the nuclear power plants, recommendations have been made by the task forces which are being implemented after due process of approval. The salient recommendations made by the task forces are:
  - Automatic reactor shutdown initiation sensing seismic activity.
  - Augmentation of cooling water inventories and provisions for additional hook up arrangements through external sources and provision of mobile diesel driven pump sets.
  - Increasing the duration of the passive power sources/battery operated devices for monitoring important parameters for a longer duration.
  - Additional shore protections measures at Tarapur Atomic Power Station and Madras Atomic Power Station.
  - Revision of Emergency Operating Procedures (EOPs) and structured training programs to train plant personnel on modified EOPs.
    - Inerting (filling up of the containment with nitrogen) of the TAPS-1&2 containment.  
([http://www.dae.nic.in/writereaddata/rsus1863\\_180811.pdf](http://www.dae.nic.in/writereaddata/rsus1863_180811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1864**  
TO BE ANSWERED ON 18.08.2011

### URANIUM RESERVES IN ANDHRA PRADESH

1864. SHRI RAM JETHMALANI:  
SHRI RAVI SHANKAR PRASAD:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that uranium reserves of India have now doubled as compared to earlier one, as a result of finding the new reserves of uranium in Andhra Pradesh;
- (b) if so, the reaction of Government thereto;
- (c) whether the cost of production from these new mines has also been estimated and;
- (d) if so, the details thereof and the assessment regarding dependence on fuel to be imported from foreign countries to meet the demand of uranium in the country?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)&(b) Uranium reserves in India has enhanced substantially over the years which stands at 1,72,762 tonnes of Uranium (U<sub>3</sub>O<sub>8</sub>) as on 30.06.2011. Major part of these uranium resources are from the State of Andhra Pradesh which is 83,538 tonnes of Uranium (U<sub>3</sub>O<sub>8</sub>). Based on the establishment of uranium resources, the Uranium Corporation of India Ltd. (UCIL), a Public Sector Undertaking under the Department of Atomic Energy (DAE) has taken up construction of uranium mines and mineral processing plant in Andhra Pradesh (Tummalapalle Project).

(c) Yes, Sir.

(d) The estimated cost of production for Tummalapalle Project is Rs.11,770/- per kg Uranium (U<sub>3</sub>O<sub>8</sub>) (Base Date: December, 2005) and Rs.15,680/- per kg Uranium(U<sub>3</sub>O<sub>8</sub>) for expansion of Tummalapalle Project (Base Date: March, 2010). The indigenous uranium will help India to increase the installed nuclear capacity thereby providing more electricity for economic growth of the country.

([http://www.dae.nic.in/writereaddata/rsus1864\\_180811.pdf](http://www.dae.nic.in/writereaddata/rsus1864_180811.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1865**  
TO BE ANSWERED ON 18.08.2011

### POLICY CHANGE IN RESPECT OF ATOMIC POWER PLANT

1865. DR. YOGENDRA P. TRIVEDI:

Will the PRIME MINISTER be pleased to state:

- (a) whether country is trying to change its policy related to the atomic power plants considering the radiation emanating from the atomic energy plant, Japan;
- (b) if so, the norms of project; and
- (c) the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The incident at Fukushima Daiichi Nuclear Power Plant in Japan resulted from an extreme natural event of a massive earthquake of magnitude 9.0 followed by an over 14 m high Tsunami. Although the reactors were shutdown and nuclear chain reaction terminated, the total loss of power and resultant loss of reactor core cooling led to formation and subsequent explosion of Hydrogen which in turn led to release of radioactive materials into the atmosphere. Prompt emergency measures ensured that there were no fatalities as a result of the nuclear incident and no member of public has been exposed to radiation beyond stipulated limits. The situation is now being stabilized. Safety is a moving target and regular reviews of incidents at national and international levels and incorporation of lessons learnt from these, as appropriate, are inbuilt in safety culture at Indian nuclear power plants. In line with this, Nuclear Power Corporation of India Limited (NPCIL) constituted six task forces, to review the safety of Indian reactors in the context of the Fukushima incident. The safety evaluation has found that Indian nuclear power reactors are safe against extreme natural events. The reports have been submitted to the government and also put in public domain. Committees have also been constituted by the Atomic Energy Regulatory Board (AERB) and Bhabha Atomic Research Centre (BARC) which are evaluating the safety of nuclear power reactors. Their recommendations and that of other international studies will also be appropriately implemented. India's energy resources are limited and its demand is huge and rapidly growing. In the Indian scenario, all sources of electricity generation need to be harnessed optimally. Given India's energy resource profile, nuclear power is an important clean energy option for long term energy security and sustainability. It will be pursued, with enhanced emphasis on safety.
- (b)&(c) Additional safety features which have been recommended by NPCIL task forces are:
  - Automatic reactor shutdown initiation sensing seismic activity.

## **Nuclear and Arms Control Centre**

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- Augmentation of cooling water inventories and provisions for additional hook up arrangements through external sources and provision of mobile diesel driven pump sets.
- Increasing the duration of the passive power sources/battery operated devices for monitoring important parameters for a longer duration.
- Additional shore protection measures at Tarapur Atomic Power Station and Madras Atomic Power Station.
- Revision of Emergency Operating Procedures (EOPs) and structured training programs to train plant personnel on modified EOPs.
- Inerting (filling up of the containment with nitrogen) of the TAPS-1&2 containment.

([http://www.dae.nic.in/writereaddata/rsus1865\\_180811.pdf](http://www.dae.nic.in/writereaddata/rsus1865_180811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1866**  
TO BE ANSWERED ON 18.08.2011

### URANIUM DISCOVERED IN TUMMALAPALLE

1866. PROF. P.J. KURIEN:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that huge quantity of uranium has been discovered in the Tumalapalle region in Andhra Pradesh;
- (b) if so, the details thereof;
- (c) the details of action plan of Government to use this uranium in our Reactors and also to commercially exploit the same; and
- (d) to what extent would this new finding of uranium help the country to reduce its dependence on other countries for import of enriched uranium?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy, has so far established the presence of 63,269 tonnes of uranium resources (U<sub>3</sub>O<sub>8</sub>) in Tumallapalle area, Kadapa District, Andhra Pradesh.
- (c) The Uranium Corporation of India Ltd. (UCIL), a Public Sector Undertaking under Department of Atomic Energy, has undertaken the construction of an underground mine and plant of 3000 tonnes per day (tpd) ore capacity which is expected to be commissioned in the year 2012. The pre-project activities for augmenting the production and processing capacity to 4500 tpd ore are in progress and expected to be commissioned in the year 2015. Further plans have been envisaged to construct a mine and a plant of 6000 tpd ore capacity (in stages) after successful commissioning of the ongoing project.
- (d) The indigenous uranium will help India to increase nuclear installed capacity, thereby, providing more electricity for economic growth of the country.

([http://www.dae.nic.in/writereaddata/rsus1866\\_180811.pdf](http://www.dae.nic.in/writereaddata/rsus1866_180811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1867**  
TO BE ANSWERED ON 18.08.2011

### IMPACT OF FUKUSHIMA DISASTER ON NUCLEAR COOPERATION

#### AGREEMENT

1867. SHRI ISHWARLAL SHANKARLAL JAIN:

Will the PRIME MINISTER be pleased to state:

- (a) whether the effect of damages taken place in the Fukushima nuclear reactors due to recent Tsunami, is likely to be casted on the nuclear cooperation agreement dialogue with India;
- (b) whether Government after being alerted from Tsunami has assessed the locations of its nuclear plants keeping in view the damages of nuclear reactors due to Tsunami in Japan;
- (c) whether any meetings/reviews are being held in India and Japan with regard to the security of nuclear power houses; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) No Sir. The Fukushima (Japan) incident is not expected to have a negative impact on bilateral nuclear cooperation.
- (b) Yes Sir. The Tsunamigenic setting of the Indian coastal nuclear power plants is different from that of Japan. The Tsunamigenic faults (where Tsunamis originate) in case of India, the Makran Fault in respect of the West coast and the Sumatra Fault in respect of the East coast are 990 and 1300 km away from the locations of Indian nuclear power plants, as against 130 km in case of Fukushima in Japan. This long distance provides sufficient warning and also reduces the energy of the Tsunami. The Madras Atomic Power Station (MAPS) and Kudankulam project (under construction) in Tamil Nadu on the east coast were not affected by the 2004 Tsunami caused by an earthquake of magnitude 9.2
- (c) Yes Sir.
- (d) Safety and security reviews of existing nuclear power plants in the context of Fukushima incident have taken places in India and across all countries with nuclear power programmes. In India, the safety of Indian nuclear power plants has been reviewed in the context of the Fukushima incident by task forces constituted by Nuclear Power Corporation of India Limited (NPCIL). These task forces have submitted their reports and these have been put in public domain on the websites of NPCIL and Department of Atomic Energy (DAE). They have found that the Indian nuclear power plants are safe against extreme natural events. Committees constituted by the Atomic Energy Regulatory Board (AERB) and the Bhabha Atomic Research Centre (BARC) are also conducting a review of safety of Indian nuclear power plants. The task forces have made recommendations to further enhance the safety of existing nuclear power plants, which



## **Nuclear and Arms Control Centre**

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are being implemented after due process of approval. India is also participating in safety review meetings being organised by International Atomic Energy Agency (IAEA).

([http://www.dae.nic.in/writereaddata/rsus1867\\_180811.pdf](http://www.dae.nic.in/writereaddata/rsus1867_180811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1868**  
TO BE ANSWERED ON 18.08.2011

### GREEN SIGNAL TO JAITAPUR NUCLEAR PROJECT

1868. SHRI MOHD. ALI KHAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has given green signal for Jaitapur nuclear project;
- (b) if so, the details thereof; and
- (c) the safety measures to be adopted in future?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)&(b) Government accorded 'in principle' approval for locating two units at Jaitapur site in the year 2005 and subsequently in 2009, for the full potential of the site for locating six units of 1650 MW was approved. Following 'in principle' approval, detailed Environment Impact Assessment (EIA) studies were carried out. After due process, the Ministry of Environment and Forests accorded environmental clearance. Coastal Regulation Zone (CRZ) clearance for the project has also been accorded. The Project is planned to be implemented in a phased manner with two 1650 MW reactors in the first phase to begin with. Discussions are in progress between NPCIL and Areva to arrive at detailed project proposals. On finalization of the project proposal, financial sanction will be obtained. Meanwhile, certain apprehensions were raised by the local people on the project and their doubts / misconceptions have been clarified.
- (c) A comprehensive review of the safety features /project designs is being carried out by the designers and regulatory body of the vendor country and also by India's Atomic Energy Regulatory Board (AERB). Any additional safety features recommended will be incorporated for further enhancing the safety

([http://www.dae.nic.in/writereaddata/rsus1868\\_180811.pdf](http://www.dae.nic.in/writereaddata/rsus1868_180811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1869**  
TO BE ANSWERED ON 18.08.2011

### IMPACT OF FUKUSHIMA ACCIDENT ON INSTALLATION OF NUCLEAR PLANTS

1869. SHRI K.E. ISMAIL:

SHRI M.P. ACHUTHAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether the set back in Fukushima atomic power plant in Japan made any impact on the installation processes of nuclear power plants in India;
- (b) if so, the details thereof;
- (c) whether Government is actively considering to add more safety measures in the present design for those plants on the basis of Fukushima set back; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)&(b) The Indian nuclear power programme is on course, with enhanced emphasis on safety. The safety of Indian nuclear power plants has been reviewed in the context of the Fukushima (Japan) incident by task forces constituted by Nuclear Power Corporation of India Limited (NPCIL). These task forces have submitted their reports. They have found that the Indian nuclear power plants are safe against extreme natural events. These reports have also been placed in public domain on the websites of NPCIL and Department of Atomic Energy (DAE).
- (c) The NPCIL task forces have made recommendations to further enhance the safety of existing nuclear power plants, which are being implemented after due process of approval. The recommendations of the committee constituted by the Atomic Energy Regulatory Board (AERB) are expected in near future. Same will also be implemented.
- (d) The salient recommendations to further enhance the safety made by the task forces are:
  - Automatic reactor shutdown initiation sensing seismic activity.
  - Augmentation of cooling water inventories and provisions for additional hook up arrangements through external sources and provision of mobile diesel driven pump sets.
  - Increasing the duration of the passive power sources/battery operated devices for monitoring important parameters for a longer duration.

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- Additional shore protections measures at Tarapur Atomic Power Station and Madras Atomic Power Station.
- Revision of Emergency Operating Procedures (EOPs) and structured training programs to train plant personnel on modified EOPs.
- Inerting (filling up of the containment with nitrogen) of the TAPS-1&2 containment.

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## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1870**  
TO BE ANSWERED ON 18.08.2011

### POLICY FOR SETTING UP NUCLEAR PLANTS

1870. SHRI SATYAVRAT CHATURVEDI:

SHRI MOTILAL VORA:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that after blasts in three reactors of Fukushima nuclear plant of Japan, some countries of the world are considering closing down of nuclear power plants and exploring alternative power;
- (b) the policy of Government with regard to setting up new nuclear power plants;
- (c) whether Germany has proposed to provide support to India for solar energy and renewable energy; and
- (d) if so, the reactions of the Government thereto?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) There are 30 countries where 440 nuclear power plants are in operation. There are 65 reactors under construction in 15 countries. Following the Fukushima (Japan) incident, only two countries, viz: Germany and Switzerland have announced phasing out nuclear power.
- (b) India's energy resources are limited and its demand is huge and rapidly growing. In Indian scenario, no single source of power can meet the demand and all sources need to be deployed optimally. Nuclear power is an important clean energy option for long term energy security. The Indian nuclear power programme will continue with enhanced emphasis on safety.
- (c) There is no proposal from Germany to support entire solar energy and renewable energy sector. However, there are some projects where German companies/technologies are involved.
- (d) The government desires to develop renewable energy in a big way and welcomes collaborations which benefit the country.

([HTTP://WWW.DAE.NIC.IN/WRITEREADDATA/RSUS1870\\_180811.PDF](http://www.dae.nic.in/writereaddata/rsus1870_180811.pdf))

## Nuclear and Arms Control Centre

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**Ministry of External Affairs**  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1917**  
TO BE ANSWERED ON 18.08.2011  
**SHRI KALRAJ MISHRA:**

### **CONDITIONS FOR CIVIL NUCLEAR PACT WITH US**

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the US Secretary of State during her recent visit reiterated US commitment to the civil nuclear pact with India and asked India to ratify the UN convention on Nuclear damages and bring its domestic liability regime in line with the international norms;
- (b) if so, the decision taken by Government on said US demand; and
- (c) the implications and impact thereof on India's Nuclear programme?

#### **ANSWER**

THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS (SHRI E. AHAMED)

(a) to (c) During the recent visit of the US Secretary of State, Ms. Hillary Clinton to India in July 2011, both sides reiterated their continued commitment for full implementation of the Indo-US Agreement for cooperation concerning peaceful uses of nuclear energy. The US had ratified the Convention on Supplementary Compensation (CSC) and India conveyed its intention to ratify the CSC within this year. India is committed to ensuring a level playing field for US companies seeking to enter the Indian nuclear energy sector, consistent with India's national and international legal obligations.

(<http://meaindia.nic.in/mystart.php?id=100518153>)

## Nuclear and Arms Control Centre

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Ministry of External Affairs  
RAJYA SABHA  
UNSTARRED QUESTION NO.1900  
TO BE ANSWERED ON 18.08.2011

**SHRI K. N. BALAGOPAL:**

### NUCLEAR SUPPLY TO THE COUNTRY

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the International Nuclear Supply Group is ready to give nuclear supply without any new conditions;
- (b) if so, the details of supply received and supply contracts signed;
- (c) whether any country in the above group is stipulating any new condition regarding nuclear supply; and
- (d) if so, the details thereof?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SHRI E. AHAMED)

(a) to (d) The Nuclear Suppliers Group (NSG) Statement on Civil Nuclear Cooperation with India issued on 6 September, 2008 spells out the scope of our international cooperation in this field. Subsequently, India has signed bilateral arrangements on cooperation in the peaceful uses of nuclear energy with a number of countries. During its plenary meeting in the Netherlands on 23-24 June, 2011, NSG agreed on new guidelines on the transfer of enrichment and reprocessing technologies. In this context, the United States, France and Russia have clarified in separate statements their positions on NSG decision and have reiterated commitment to the full implementation of the respective bilateral agreements with India on cooperation in the peaceful uses of nuclear energy. As far as India is concerned, the September 2008 decision is the basis and overarching framework that governs our international cooperation in civil nuclear matters. The agreements reached for permitting international civil nuclear cooperation with India contain commitments on both sides. We expect all NSG members to honour their commitments as reflected in the 2008 NSG Statement and our bilateral cooperation agreements.

(<http://meaindia.nic.in/mystart.php?id=100518128>)

## Nuclear and Arms Control Centre

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Ministry of External Affairs  
RAJYA SABHA  
STARRED QUESTION NO.254  
TO BE ANSWERED ON 18.08.2011

**SHRI NARENDRA KUMAR KASHYAP:**

### **PROGRESS IN INDO-US CIVIL NUCLEAR AGREEMENT**

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) the details of the progress made so far following Indo-US civil nuclear agreement;
- (b) whether the locations have been identified in the country for setting up of nuclear plants for utilizing atomic energy in public interest; and
- (c) the time by when the current power demand is likely to be met with atomic power?

ANSWER THE MINISTER OF EXTERNAL AFFAIRS (SHRI S.M. KRISHNA)

(a) to (c) The India – US Agreement for cooperation concerning peaceful uses of nuclear energy was signed on 10 October 2008 and entered into force on 6 December 2008. Arrangements and procedures between the two governments pursuant to Article 6(iii) of the Agreement was signed on 30 July 2010. In October 2009, Government of India announced the allocation of two sites – Chhayamithi Viridi and Kovvada – for setting up Light Water Reactor (LWR) based power plants in cooperation with the US. The two sides are in discussion regarding the setting up of nuclear power plants and other cooperation in the nuclear field.

(<http://meaindia.nic.in/mystart.php?id=100518101>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 231**  
TO BE ANSWERED ON 17.08.2011

### SAFETY INSPECTIONS BY AERB

\*231. SHRI ABDUL RAHMAN:

SHRI KODIKKUNNIL SURESH:

Will the PRIME MINISTER be pleased to state:

- (a) whether the private clinics using MRI, Ultrasound, X-ray machines etc. are required to be registered with the Atomic Energy Regulatory Board (AERB);
- (b) if so, the details thereof;
- (c) the details of the agencies, institutions, etc. registered with the AERB and the benefits enjoyed by them;
- (d) whether such agencies/institutions are subjected to any review/inspections to ascertain adherence of the prescribed safety and other rules of AERB;
- (e) if so, the details of inspections carried out during each of the last three years and the current year, State-wise; and
- (f) the details of the agencies/institutions found to be violating the prescribed rules and safety norms and the action taken/proposed to be taken against them?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) to (f) A statement is laid on the Table of the House.

STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION  
NO.231 BY SHRI ABDUL RAHMAN AND SHRI KODIKKUNNIL SURESH  
REGARDING SAFETY INSPECTIONS BY AERB

- (a) The medical X-ray equipment, being ionizing radiation generating units, of private clinics are also required to be Licensed/ Registered with Atomic Energy Regulatory Board (AERB). MRI and Ultrasound units are not emitting ionizing radiation, so these units are not required to be registered with AERB.
- (b) Licence/ Registration of medical diagnostic X-ray equipment is issued by AERB after verifying compliance requirements such as availability of Site and Layout Approval, Qualified Personnel, Type Approval of X-ray equipment and other safety specific requirement as per AERB Safety Code for Medical Diagnostic X-ray Equipment and Installations.
- (c) The total number of equipment (Computer Tomography and Interventional Radiology) for which Licenses have been issued are 258 and the other X-Ray equipment Registered with AERB to date are 4479. AERB Licenses/registers equipment that conform to the safety requirements as prescribed by AERB. Since all parameters of radiation safety are assured, the patients, doctors, the radiation workers and all concerned with that diagnostic equipment are expected to be safe with respect to radiation exposure. Also, the AERB

## Nuclear and Arms Control Centre

registration/ licence of X-ray equipment is mandatory for National Accreditation Board for Hospitals and Healthcare (NABH), providers of accreditation.

- (d) Medical X-Ray installations are subjected to regulatory review/ inspection by personnel authorized under Rules 30 and 31 of Atomic Energy (Radiation Protection) Rules, 2004. In view of the low hazard potential, such institutions are inspected on a random basis.
- (e) The inspections carried out in the last three years are as follows:

State	Year 2008	Year 2009	Year 2010	Year 2011
Tamil Nadu	-	-	-	10
Karnataka	-	12	-	21
Goa	-	-	2	1
Maharashtra	8	3	4	
Delhi	5	-	5	4
Rajasthan	-	6	-	5
Uttar Pradesh	1	-	4	-
Assam	-	-	-	4
West Bengal	-	-	-	1
Andhra Pradesh	-	-	-	15
Chandigarh	1	1	-	-
Meghalaya				3
Tripura				1
Madhya Pradesh	-	10	-	-
Haryana	-	-	1	-
Kerala (DRS)	7	9	22	59

- (f) The licence(s)/registration(s) are issued to X-ray installations by the Competent Authority only after confirming that prescribed safety requirements are duly complied with by the institutions. The overall safety of X-ray installations depends largely on the built-in-design of X-ray machine and also the operational safety. For ensuring the design safety of X-ray machines, the Type approvals are issued by the Competent Authority, which ensures the built-in-safety features and safety interlocks of the machine. Hence the likelihood of radiological consequences in case of minor deviations of safety provisions are not so significant in case of X-ray installations in view of the safe design of X-ray machines. In case of any institution violating the prescribed safety rules or safety norms, there is provision that Competent Authority, based on the radiological consequences, may suspend/ modify/withdraw the licence / registration issued to that X-ray installation or seal X-ray installation(s) in accordance with Rule 10 and 31 of the Atomic Energy (Radiation Protection) Rules, 2004.

It is observed that in general, X-ray institutions/ agencies conform to the safety norms prescribed by the Competent Authority. However, non-compliances with regulatory requirements /safety discrepancies have been observed in some X- ray institutions but with no impact on overall radiological safety of the installation. The show cause notices have been issued to five such X-ray institutions (4 in Kerala and 1 in Karnataka) stating the non-compliances with safety norms. These institutions have already taken corrective actions and complied with the prescribed safety norms.

([http://www.dae.nic.in/writereaddata/lssq231\\_170811.pdf](http://www.dae.nic.in/writereaddata/lssq231_170811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2548**  
TO BE ANSWERED ON 17.08.2011

### DISPOSAL OF RADIOACTIVE WASTE

2548. SHRI P.L. PUNIA:

Will the PRIME MINISTER be pleased to state:

- (a) whether the cases of radiation spread from the scraps of chemistry laboratories of universities have come to the notice of the Government;
- (b) if so, the details thereof; and
- (c) the action taken/being taken by the Government for disposing of the said scrap?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)&(b) One case involving radiation exposure arising from unauthorized disposal of a device containing radioactive material had come to the notice of the Government during April 2010. No other case from chemistry laboratories of any university has come to the notice of the Government.

The incident involving exposure to seven persons, resulted in death of a person and radiation injuries to two persons. This was due to handling of bare radioactive Cobalt sources of Gamma Cell-220 belonging to University of Delhi. This gamma cell was auctioned by University of Delhi and dismantled in the Mayapuri Scrap yard, New Delhi. After the incident, a thorough investigation was carried out and several corrective actions were taken to prevent recurrence of such event.

(c) All the sources and contaminated items were retrieved from the site and safely disposed off, following the well established procedure.

([http://www.dae.nic.in/writereaddata/2548\\_lsus170811.pdf](http://www.dae.nic.in/writereaddata/2548_lsus170811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2572**  
TO BE ANSWERED ON 17.08.2011

### INTERNATIONAL CONVENTION ON CSC

2572. SHRI PRADEEP MAJHI:

SHRI KISHNBHAI V. PATEL:

Will the PRIME MINISTER be pleased to state:

- (a) whether the United States want India to ratify the international Convention on Supplementary Compensation (CSC) on nuclear damages by the end of this year;
- (b) if so, the details thereof and the reaction of the Government thereto;
- (c) the reasons for raising ratification by US on CSC; and
- (d) the time by which India proposes to ratify the provisions in CSC as demanded by US?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)to(d) India signed the International Convention on Supplementary Compensation (CSC) on nuclear damages on 27th October 2010. India is committed to ratifying CSC by the end of 2011.

Ratification of CSC will facilitate US-based companies to enter into technical cooperation with Indian Government companies for building nuclear power plants.

([http://www.dae.nic.in/writereaddata/2572\\_lsus170811.pdf](http://www.dae.nic.in/writereaddata/2572_lsus170811.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2586**  
TO BE ANSWERED ON 17.08.2011

### SAFETY OF NUCLEAR POWER PLANTS

2586. SHRI P. KUMAR:  
SHRI SURESH KUMAR SHETKAR:  
SHRI M.I. SHANAVAS:  
SHRI NAVEEN JINDAL:  
SHRI A.T. NANA PATIL:  
SHRI SURESH ANGADI:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Indian nuclear reactors have been subjected to quality upgradation at par with the technological upgradation being affected in other countries;
- (b) if so, the details thereof;
- (c) the steps taken/proposed to be taken by the Government to handle nuclear emergencies in our nuclear reactors;
- (d) whether the National Disaster Management Authority has sought enhanced safety capabilities; and
- (e) if so, the details thereof and the follow up action taken by the Government in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Review of safety and performance and their upgradation is an ongoing activity in Indian nuclear power plants.
- (b) The features, systems and procedures are periodically reviewed in the context of operational feedback and continuously evolving safety standards around the world. Upgrades have been carried out at Indian nuclear power stations to bring them to the state-of-the-art in terms of safety. In addition, Renovation and Modernisation has been carried out at six reactors (RAPS-2, MAPS- 1&2, NAPS 1&2 and KAPS-1) and life extension measures undertaken at two reactors (TAPS 1&2).
- (c) Emergency preparedness plans are in place at all nuclear power plants. These plans are put in place before the start of operation of the plants. The emergency preparedness plans at each nuclear power plant are periodically reviewed and upgraded. Off-site emergency exercises are carried out once in two years to verify, validate and obtain the feedback. Based on the feedbacks the emergency preparedness plans are improved.
- (d)&(e) National Disaster Management Authority does not deal with the safety of the plant. However, they concentrate on disaster management and emergency preparedness. In the event of potential off-site emergencies in public domain, the authorities at the level of districts, state and centre are to play a vital role in response and accordingly off-site emergency plans of nuclear power plants are reviewed. Mock drills at different nuclear installations located in different states are conducted with the association of National Disaster Management Authority (NDMA) and officials of the concerned states / districts. The gaps identified in co-ordination and response preparedness are being addressed by all concerned.

[http://www.dae.nic.in/writereaddata/2586\\_lsus170811.pdf](http://www.dae.nic.in/writereaddata/2586_lsus170811.pdf)

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2620**  
TO BE ANSWERED ON 17.08.2011

### INTERNATIONAL ACCORD/TREATY

2620. SHRI UMASHANKAR SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) the details of the international accord/treaty for fixing the responsibility of accidents in nuclear power plants;
- (b) whether the Government proposes to enact a law for imposing penalty against nuclear plants for accidents;
- (c) if so, the details thereof and the time by which the said law is likely to be enacted; and
- (d) if not, the reasons therefor?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) At the international level, there are four instruments for nuclear liability ie. the 1960 Paris Convention, 1963 Vienna Convention, 1997 Protocol to Amend Vienna Convention, and 1997 Convention on Supplementary Compensation for Nuclear Damage (CSC). CSC was developed under the auspices of International Atomic Energy Agency (IAEA). It provides for treaty relations among all countries that accept the basic principles of nuclear liability law.

India has signed the CSC in Vienna on 27 October 2010. The Convention has not yet been ratified by India.

- (b)to(d) India has already enacted a legislation called 'The Civil Liability for Nuclear Damage Act, 2010'. In terms of sub-section (5) of Section 1 of the Civil Liability for Nuclear Damage Act, 2010, Government has initiated action for issuing a notification bringing this Act into force.

([http://www.dae.nic.in/writereaddata/2620\\_lsus170811.pdf](http://www.dae.nic.in/writereaddata/2620_lsus170811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2661**  
TO BE ANSWERED ON 17.08.2011

### **REVIEW OF ATOMIC ENERGY ACT**

2661. SHRI P.C. GADDIGOUDAR:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government proposes to review/change the Atomic Energy Act;
- (b) if so, the details thereof and the steps taken by the Government in this regard; and
- (c) the time by which a decision in this regard is likely to be taken?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) to (c) A proposal for the amendment of the Atomic Energy Act 1962 is under consideration of the Government. A decision regarding this is possible only after taking all relevant factors into account.

([http://www.dae.nic.in/writereaddata/2661\\_lsus170811.pdf](http://www.dae.nic.in/writereaddata/2661_lsus170811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2695**  
TO BE ANSWERED ON 17.08.2011

### NUCLEAR REGULATORY AUTHORITY

2695. SHRI S.S. RAMASUBBU:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has any proposal to set up a new Regulatory Authority to oversee the functioning of nuclear plants in the country;
- (b) if so, the details thereof; and
- (c) the time by which the new authority is likely to be set up?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) to (c) Government of India attaches the highest importance to nuclear safety and will take all the necessary measures to ensure the safety of our plants. For the creation of a statutory nuclear safety authority 'The Nuclear Safety Regulatory Authority Bill' is proposed to be introduced in the Parliament.

([http://www.dae.nic.in/writereaddata/2695\\_lsus170811.pdf](http://www.dae.nic.in/writereaddata/2695_lsus170811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2747**  
TO BE ANSWERED ON 17.08.2011

### NUCLEAR WASTE

2747. SHRI NISHIKANT DUBEY:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has assessed the quantity of nuclear waste generated by the nuclear power plants in the country;
- (b) if so, the details thereof, plant-wise and State-wise;
- (c) whether the Government uses latest technology for disposing of the nuclear waste; and
- (d) if so, the details thereof and if not, the reasons therefor?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) Yes, sir.

- (b) Nuclear waste is classified into high, intermediate and low levels depending on the level of radioactivity in it. The spent fuel which contains long lived radioisotopes are stored for a long period to reduce the level of radioactivity and subsequently reprocessed at reprocessing plants for collecting fissile elements. The generation of high level waste is at reprocessing plants. The quantity of this waste in our country is much smaller due to our adoption of the closed fuel cycle. High level waste generated from the reprocessing plant is vitrified into a glassy form, contained in multiple barrier containers and stored for an interim period of three to four decades in engineered vaults with necessary surveillance facilities. After cooling down in these storage facilities, waste containers will be stored for long term in deep geological repositories.

Reprocessing and Waste Management plants are currently being operated by Bhabha Atomic Research Centre (BARC) for spent fuels arising out of unsafeguarded reactors. The low and intermediate level nuclear waste containing radioactive substances with short half life are generated at nuclear power plants and are processed at the site in the following manner:

- (i) The generated waste is solidified by fixing this in materials like cement, polymers, glass etc., to ensure that it does not move.
- (ii) The solidified waste is then stored in specially fabricated double walled high integrity stainless steel container.
- (iii) The containers containing the solidified waste are stored inside a high integrity concrete pit at each of the nuclear power plant site.

## Nuclear and Arms Control Centre

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- (iv) As the waste is fixed in cement, glass, polymer, it is immobilized, and its placement in high integrity containers inside a pit ensures that the radioactive wastes is completely insulated from the environment.

The radioactivity level of the stored waste reduces with time and by the end of the plant life, falls to normal levels.

Such facilities for handling low and intermediate level waste are located at all the nuclear power stations viz. Tarapur (Maharashtra), Rawatbhata (Rajasthan), Kalpakkam (Tamilnadu), Narora (Uttar Pradesh), Kakrapar (Gujarat) and Kaiga (Karnataka). The quantity of low and intermediate level waste to be stored at site during the life time including decommissioning is within 0.15 cubic meters/year/MW.

(c) Yes, Sir.

(d) The Government is using latest technology for safe management of the nuclear waste generated during operation of nuclear power plants. The details are as follows:

(i) The low and intermediate level radioactive waste generated during operation and maintenance of nuclear power plants is segregated, its volume reduced using various technologies and solidified. This solid/solidified waste is packaged in suitable containers to facilitate handling, transport and disposal.

(ii) Disposal of low and intermediate level waste is carried out in specially constructed structures such as stone lined trenches, reinforced concrete trenches and tile holes. These disposal structures are located both above and underground in access-controlled areas. Disposal system is designed based on multi barrier principle for ensuring effective containment of the radioactivity. The areas where the disposal structures are located are kept under constant surveillance with the help of bore-wells laid out in a planned manner. The underground soil and water samples from these bore wells are routinely monitored to confirm effective confinement of radioactivity present in the disposed waste.

The nuclear waste handling, treatment, storage and disposal is as per the well laid down procedures and guidelines stipulated by the Atomic Energy Regulatory Board (AERB).

([http://www.dae.nic.in/writereaddata/2747\\_lsus170811.pdf](http://www.dae.nic.in/writereaddata/2747_lsus170811.pdf))

## Nuclear and Arms Control Centre

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Ministry of External Affairs  
LOK SABHA  
UNSTARRED QUESTION NO.2575  
TO BE ANSWERED ON 17.08.2011

SHRI VIRENDRA KUMAR:

### NUCLEAR AGREEMENT

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the nuclear agreement with Japan has been finalized/entered into;
- (b) if so, the details thereof; and
- (c) if not, the reasons therefor?

#### ANSWER

THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS (SMT. PRENEET KAUR)

(a) to (c) No. Three rounds of negotiations on an "Agreement for Cooperation in the Peaceful Uses of Nuclear Energy" have so far been held between India and Japan. The negotiations are ongoing.

(<http://meaindia.nic.in/mystart.php?id=100518047>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO. 161**  
TO BE ANSWERED ON 11.08.2011

### INSTITUTIONS FUNDED BY DAE

161 . SHRIMATI RENUBALA PRADHAN:

Will the PRIME MINISTER be pleased to state:

- (a) the details of the institutions funded by the Department of Atomic Energy and the amount of plan and non-plan funds allocated to them so far during the last three years;
- (b) whether any achievements have been made by each such institution during the last three years;
- (c) if so, whether such achievements are of international repute; and
- (d) the details thereof, institution-wise, during the last three years?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) to (d) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO RAJYASABHA STARRED QUESTION  
NO.161 FOR ANSWER ON 11.08.2011 BY SMT. RENUBALA PRADHAN REGARDING  
INSTITUTIONS FUNDED BY DAE

- (a) The details are given in Annexure 1;
- (b) Yes, Sir;
- (c) Yes, Sir;
- (d) The details are given in Annexure 2.

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### Annexure-1

The Aided Institutions under DAE are:

1. Tata Institute of Fundamental Research (TIFR), Mumbai
2. Tata Memorial Centre (TMC), Mumbai
3. Saha Institute of Nuclear Physics (SINP), Kolkata
4. Institute of Physics (IoP), Bhubaneswar
5. Institute of Mathematical Sciences (IMSc), Chennai
6. Harish Chandra Research Institute (HRI), Allahabad
7. Institute for Plasma Research (IPR), Gandhinagar
8. National Institute of Science, Education and Research (NISER), Bhubaneswar
9. Atomic Energy Education Society (AEES), Mumbai

Details of Grants given to Aided Institutions under DAE for the period 2008-09 to 2011-12 under Plan and Non-Plan

		Rs. (in Crore)								
Sr. No.	Years	Aided Institutions								
		TIFR	TMC	SINP	IOP	IMS	HRI	IPR	NISER	AEES
1	2008-09									
	Plan	149.69	66.05	60.39	38.90	8.46	5.71	144.99	0.00	14.60
	Non Plan	148.00	112.18	41.63	12.99	16.22	12.97	37.60	0.00	39.59
	Total	297.69	178.23	102.02	51.89	24.68	18.68	182.59	0.00	54.19
2	2009-10									
	Plan	168.32	56.25	81.50	14.00	3.62	9.00	250.00	32.00	12.90
	Non Plan	198.05	140.79	52.67	14.54	21.18	14.32	48.30	0.00	34.64
	Total	366.37	197.04	134.17	28.54	24.80	23.32	298.30	32.00	47.54
3	2010-11									
	Plan	196.11	77.17	70.00	5.49	2.50	6.00	338.00	23.00	10.00
	Non Plan	195.00	217.60	46.90	12.47	25.00	14.43	44.63	0.00	32.74
	Total	391.11	294.77	116.90	17.96	27.50	20.43	382.63	23.00	42.74
4	2011-12 * (in progress)									
	Plan	325.00	80.00	60.00	15.00	2.00	15.00	515.00	210.00	15.00
	Non Plan	206.90	213.80	58.00	16.10	26.00	15.80	49.48	0.00	54.04
	Total	531.90	293.80	118.00	31.10	28.00	30.80	564.48	210.00	69.04

### Budget Estimates

The Department of Atomic Energy has been funding nine Aided Institutions which are primarily research and education institutions. These Institutions are an integral part of the Department in as much as there is a growing synergy between these institutions and the Research and Development Units of the Department. Several joint projects have been undertaken between the Units and Aided Institutions and there is frequent interaction between the academicians of the

## **Nuclear and Arms Control Centre**

aided institutions and the scientists of the R&D Units. These institutions are dedicated to fundamental / basic research and academic activities and have been fountainhead of knowledge and its applications in disciplines of interest to the Indian Atomic Energy Programme. They have excelled themselves at International level. The R&D works carried out by these institutions get published in reputed National and International Journals regularly and are well acclaimed. They are also cited as reference materials.

Some important achievements of the nine Institutions during the last three years, institution wise, are given hereunder:

### **Tata Institute of Fundamental Research (TIFR), Mumbai**

- ❖ Publication of around 1500 scientific papers in journals, 500 papers in proceedings, and 100 in books/chapters during the last three years
- ❖ Enrolling 247 Ph.D, 61 Integrated Ph.D. and M.Sc. students between 2008-2009 to 2010-2011
- ❖ Homi Bhabha Centre for Science Education (HBCSE) is the nodal institute for the International Science Olympiads and Indian students trained at the HBCSE orientation camps have won 25 gold medals between 2008 to 2010.
- ❖ Foundation of a new campus of TIFR and a new Centre for Interdisciplinary Sciences (TCIS) in Hyderabad.
- ❖ Participation of TIFR, as host Institute, in the large multi-institutional project to establish the India-based Neutrino Observatory (INO) in Tamilnadu.
- ❖ Setting up of the International Centre for Theoretical Sciences (ICTS) at Bengaluru.
- ❖ Three high end instruments Large Area Xenon Proportional Counter (LAXPC), Cadmium Zinc Telluride Imager (CZTI) and Soft X-ray Telescope (SXT) for the Indian Astronomy satellite ASTROSAT to be launched in 2012 are undergoing final tests.
- ❖ A five teraflop IBM blue-gene supercomputer facility was set up and reliable estimates of the crossover temperature and critical point in quantum chromodynamics were computed to provide important guides to the design of experiments worldwide.
- ❖ A novel optical design allowed Bose-Einstein condensates of cold atoms to form, and optical lattices to hold very large numbers of atoms
- ❖ In the biological sciences, exquisitely sensitive light microscopy was used to show how domains of proteins are organized on the membrane of the cell, leading to long-range signalling capability.
- ❖ In mathematics, work done on the geometry of moduli spaces was a substantial advance in the field. The existence and qualitative properties of solutions of partial differential equations were established in a number of cases in Euclidean and other geometries
- ❖ In computer science, work on algebraic complexity revealed fundamental problems in traditional approaches. A new architecture was proposed to overcome the analog-to-digital conversion bottleneck for multi-gigabit wireless networks.
- ❖ In theoretical physics, a profound connection was established between the classical theory of gravity and the Navier-Stokes equations of fluid dynamics.

### **Tata Memorial Centre (TMC), Mumbai**

## Nuclear and Arms Control Centre

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- ❖ Internationally well recognized cancer treatment institution, having received awards from several international/national fora
  - Express Healthcare Excellence Awards 2008.
  - CFBP Jannalal Bajaj Uchit Vyavahar Puraskar, 2009.
  - Gloden Peacock Innovation Award for the year 2010 for Tata Memorial Centre - 2010
  - The Zee News Swastha Bharat Samman was conferred upon Tata Memorial Hospital in the special category 'healing with human touch'. – 2010.
  - International Peer Review 2010
  - In a year on an average TMC handles 50000 new cases and 3,50,000 follow-up cases
- ❖ Investments in clinical research has resulted in path breaking outcome that has the capability of saving thousands of lives in India and globally at a minuscule cost of 100/- (presented at the prestigious San Antonio meeting held in 2009-10 and published in the leading publication, Journal of Clinical Oncology 2011).
- ❖ Using indigenous Telecobalt machine “Bhabhatron-II” manufactured in conjunction with BARC, treated more than 16000 patients. This machine has been donated to Vietnam, Srilanka and other developing countries through IAEA.
- ❖ Contributing to more than 60% of national oncology human resources and presently have more than 100 students annually trained in Oncology and allied specialties.
- ❖ Running the world’s largest single screening trial testing low cost implementable technology for early detection of Breast and Cervical cancers in women supported by NCI, USA as a model intervention for developing world.
- ❖ Developing affordable stainless steel implant TMH-NICE, designed for Indian anthropometric parameters in collaboration with a local implant manufacturer, which is available at one tenth of the cost of the imported prosthesis (USD 10,000 – 30,000).
- ❖ The largest number of bone-marrow transplants for oncology being performed for poor and middle class patients.
- ❖ Department of Cytopathology developed an innovative, easy rapid and inexpensive alternative technology DAM that is at par with Liquid Base Cytology (LBC) and costs only 2/- per test.
- ❖ TMC District Cancer Control Programme has been featured in the UICC International Union Against Cancer Manual to become a bench mark model Cancer Control Programme
- ❖ The institute has around 350 on going research projects and more than 1200 publications

### Saha Institute of Nuclear Physics (SINP), Kolkata

SINP, with its 130 faculty members, 160 research fellows and associates, is engaged in research in advanced scientific fields viz., Condensed Matter Physics, Material Physics, Nuclear Physics, High Energy Physics and Microelectronics, Theoretical Physics as well as Biophysical Sciences.

Scientists in SINP have contributed in 1050 research publications in the past four years and 70 thesis awarded for Ph.D degrees during this period.

The areas in which SINP scientists have made important contributions are as follows:

## Nuclear and Arms Control Centre

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- ❖ Biophysical Science including Chemistry - Under this the fields covered are Biophysics, Crystallography, Molecular Biology, Chemical Science, Structural Genomics and Electron Microscope
- ❖ Condensed Matter Physics including Surface Physics and Nano-science – This field mainly consists of theoretical and condensed matter physics and applied material science.
- ❖ Experimental nuclear and particle physics – comprising of nuclear physics and particle physics
- ❖ Plasma Physics and Electronics
- ❖ Theoretical physics including mathematics comprising of theory and astro-particle physics and cosmology

The institute is contributing in academic output by running vibrant Ph.D. programme and also short term training programmes for Summer Projects for graduate students as well as an Undergraduate Associateship Programme.

### Institute of Physics (IoP), Bhubaneswar

- ❖ Carrying out research work on the effect of random force on a double-stranded DNA in unzipping its two strands attracting a lot of attention in the International community.
- ❖ Several new theoretical models have been proposed to enhance the efficiency of nanomachines and engines at nanoscale. Some of them were experimentally verified in international laboratories.
- ❖ Several important studies were performed on interacting many body systems such as traffic flows, data transmission over a network, and granular materials.
- ❖ IoP is a hub of energetic ion beam induced materials research in the country
- ❖ A new ion beam analysis end station has been established for depth profiling of hydrogen to uranium which is unique in the country.
- ❖ Establishing state-of-the-art facilities for pursuing cutting edge materials research,
- ❖ catering to the needs of several institutions and universities across India.
- ❖ Prediction of a new model of fission decay, viz., multi fragmentation fission which will have enormous applications in future nuclear energy production
- ❖ Publication of around 242 research papers, which is very significant.

### Institute of Mathematical Sciences (IMSc), Chennai

- ❖ Internationally recognized Mathematical Research Institute, doing research in the areas of Mathematics, spanning number theory, algebraic geometry, mathematical physics, non-comutative geometry and topology – attracting a significant number of bright Ph.D. students to its programmes

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- ❖ Continued research and education programmes in the field of Theoretical Physics, Mathematics and Theoretical Computer Science, scientific subjects covering a wide range of fields from understanding the structure of the universe to understanding how small organisms such as bacteria swim.
- ❖ Publication of around 282 scientific papers, mainly in the international journals
- ❖ Recognition received by IMSc faculty includes Bhatnagar Award, Fellowships of National Science Academy, Plenary Lecture at the International Congress of Mathematicians (ICM 2010), the award of the Chevalier de l'Order of Merit of the French Government

### **Institute for Plasma Research (IPR), Gandhinagar**

- ❖ Undertakes research in fundamental plasma science, its applications and fusion research, contributed immensely as demonstrated through publications in peer-reviewed, reputed journals and doctoral theses.
- ❖ India's joining of International Thermonuclear Experimental Reactor (ITER) programme at Cadarache, France
- ❖ India's joining a select club of nations who will carry out a unique experiment on ITER to prove fusion-blanket technology, which will help accelerate the indigenous development of fusion based power plants.
- ❖ Indigenous development of Reduced Activation Ferritic Martensitic Steel (RAFMS)
- ❖ Conducting several international collaborative programmes and exchange programmes.

### **Harish Chandra Research Institute (HRI), Allahabad**

- ❖ HRI carries out research in the fields of Mathematics, especially in the areas of algebra, theory group and group rings, representation theory and infinite dimensional Lie algebra. In the field of physics research work is carried out on astrophysics, condensed matter physics, quantum information and computing, high energy phenomenology and string theory.
- ❖ The research papers published from the Institute are well recognized and a good number of researchers/scientists are recipients of SS Bhatnagar Awards and are Members of the National Science Academies. The publications of this Institute have high impact factor with high average citation for the publications are very high. The total number of publications in Mathematics is 66 and 294 in physics in the last three years.

### **Atomic Energy Education Society (AEES), Mumbai**

- ❖ Under AEES there are 30 Schools/Jr.College imparting education to the children/wards of DAE employees at different DAE/NPCIL sites.

## **Nuclear and Arms Control Centre**

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- ❖ The results of AEES for 10th standard CBSE Board are best in the country for last three years and every year on an average about 500 students get admission in professional institutes of high repute.
- ❖ AEES also has international collaboration for student exchange programme in Singapore Schools and teachers exchange programme with a few schools in UK.
- ❖ AEES provides academic support for Indian students at Monasque, France under ITER programme.
- ❖ Introduction of innovative schemes and providing facilities to impart high quality education and holistic development of students like, (i) Computer education for all ; (ii) Libraries with digital facilities; (iii) Play grounds and sports complex; (iv) High quality science education and well equipped laboratories; (v) Programmes for co-curricular development of students (vi) Satellite based education (vii) Inclusive education for all children (viii) Talent Nurture Programme for rural and tribal children by providing free education up to 12th standard (ix) Utilization of information technology for world class education (x) creation of science parks, adventure parks and botanical gardens in all schools (xi) obtaining ISO certification for Junior College, Mumbai (xiii) Financial support for community education and creation of community radio station.
- ❖ Academic excellence is ensured including participation of students in the various Olympiads.

### **National Institute of Science Education and Research, Bhubaneswar**

- ❖ Established in 2007, on the lines of IISERs, NISER's objective is to conduct five year integrated M.Sc. programme for students after 10+2 higher secondary schooling.
- ❖ The objective of this programme is to integrate these further into Ph.D. programme on the one hand and providing high quality research scientists through various R&D organizations.
- ❖ Conducting five year integrated M.Sc. programmes in the emerging core branches of basic sciences, viz., Physics, Chemistry, Mathematics and Biology.
- ❖ From 2007, around 267 students admitted for the five year integrated programme and 50 students are carrying out research towards Ph.D programme.
- ❖ Admission to the programmes through common national entrance tests
- ❖ Providing excellent academic facility to the students temporarily in the IoP campus at Bhubaneswar. The new campus is coming up in an area of 300 acres, at Jatni near Bhubaneswar .

([http://www.dae.nic.in/writereaddata/rssq161\\_110811.pdf](http://www.dae.nic.in/writereaddata/rssq161_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**STARRED QUESTION NO. 178**  
TO BE ANSWERED ON 11.08.2011

### NUCLEAR POWER PROJECT IN RAJASTHAN

\* 178. SHRI ASHK ALI TAK:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that the Site Selection Committee of Nuclear Power Corporation has selected the site for establishing new Nuclear Power Project near Mahi Bajaj Sagar dam situated at Banswara in Rajasthan; and
- (b) if so, by when Central Government proposes to approve this project?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) & (b) A statement is laid on the Table of the House

STATEMENT REFERRED TO IN REPLY TO RAJYA SABHA STARRED QUESTION  
NO. 178 FOR ANSWER ON 11.08.2011 BY SHRI ASHK ALI TAK REGARDING  
NUCLEAR POWER PROJECT IN RAJASTHAN

- (a) Yes, Sir. The Site Selection Committee of the Department of Atomic Energy had recommended the site at Mahi-Banswara near Mahi-Bajaj Sagar dam in Rajasthan for locating four 700 MW capacity indigenous Pressurised Heavy Water Reactors (PHWRs).
- (b) The Central Government has recently accorded 'in principle' approval for the site at Mahi-Banswara in Rajasthan to locate four units of indigenous 700 MW Pressurised Heavy Water Reactors.

([http://www.dae.nic.in/writereaddata/rssq178\\_110811.pdf](http://www.dae.nic.in/writereaddata/rssq178_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1241**  
TO BE ANSWERED ON 11.08.2011

### NUCLEAR PLANT AT MITHI VIRDI, BHAVNAGAR

1241. SHRI PAR SHOT TAM KHODABHAI RUPALA:

SHRI BHARATSINH PRABHATSINH PARMAR:

Will the PRIME MINISTER be pleased to state:

- ( a ) Whether Government would reconsider the proposed Atomic Energy Power Plant in Mithi Virdi, Bhavnagar, Gujarat, in view of terrible accident caused by Tsunami in nuclear power plants situated at a Japan's sea shore and taking lesson from which many developed countries have either closed their nuclear power projects, or are reconsidering to close them;
- (b) whether Government has prepared any special plan to tackle the Japan like nuclear accident; and
- (c) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The site selection is long a drawn activity and a site is accorded in principle approval by the Government after a detailed evaluation in accordance to the criteria laid down in Atomic Energy Regulatory Board (AERB) code on siting and recommendation thereof by the site selection committee of the Government. The Chhaya Mithi Virdi site in Gujarat has been evaluated for possible natural extreme events including Tsunami and found suitable. Further, the design & engineering features of the proposed plant and shore protection measures at site would ensure its capability to withstand the extreme natural events probable at the site.
- (b)&(c) The safety of existing nuclear power reactors in operation and under construction in the country has been reviewed by specially constituted task forces for each technology in operation and reactors under construction in the context of Fukushima incident in Japan. These reviews have found that there are sufficient margins in designs of Indian nuclear power plants to withstand the extreme, natural events – earthquake and Tsunami. However, to further enhance safety, recommendations made by the task forces are being implemented after due process of approval. These inter-alia include:
- Automatic reactor shutdown on sensing seismic activity
  - Augmentation of cooling water inventories and provisions for additional hook up arrangements through external sources and provision of mobile diesel driven pump sets.



## **Nuclear and Arms Control Centre**

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- Increasing the duration of the availability of auxiliary power sources/battery operated devices for monitoring important parameters when the grid power is not available.
- Additional Shore protections measures at coastal stations.

([http://www.dae.nic.in/writereaddata/rsus1241\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1241_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1242**  
TO BE ANSWERED ON 11.08.2011

### AVAILABILITY OF THORIUM

1242. SHRI SANJAY RAUT:

SHRI GOVINDRAO ADIK:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that there is much availability of thorium in the country and the country has the potential to serve as feedstock for an ambitious nuclear power programme;
- (b) if so, the details thereof; and
- (c) the details of steps taken or proposed to be taken to discover thorium and to utilize this for our nuclear power programme in the country?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) Yes, Sir.

(b) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy has established 10.70 million tonnes of Monazite in the country, which contains 9,63,000 tonnes of Thorium Oxide (ThO<sub>2</sub>). Indian Monazite contains about 9-10% of ThO<sub>2</sub> and about 8,46,477 tonnes of Thorium Metal can be obtained from 9,63,000 tonnes of ThO<sub>2</sub> which will be used for future programmes of DAE.

(c) India is pursuing a three stage nuclear power generation programme aimed at long term energy independence based on use of our abundant Thorium resources. The programme is to use Thorium for electricity generation in the long-term. In order to realize this goal, we are well into the first stage based on our modest domestic Uranium resources. This will be followed by second stage comprising of fast reactors. It is proposed to set up a large power generation capacity based on fast reactors before getting into the third stage. Thorium in itself cannot produce electricity and it has to be first converted to Uranium-233 in a nuclear reactor. A comprehensive three-stage nuclear power programme is therefore being implemented sequentially.

India has been working on the development of technologies for Utilisation of Thorium for Nuclear Power Generation since the inception of the Indian Nuclear Programme. As a part of this work, thorium has been irradiated in our Research Reactors and also in Pressurised Heavy Water Reactors. Technologies for reprocessing of irradiated thorium fuel for the separation of Uranium-233 have also been developed on a pilot plant scale. Uranium-233 thus separated has been used as fuel in research reactor Purnima-II and later in the 30 Kw Research Reactor Kamini now in operation at Indira Gandhi Centre for Atomic Research(IGCAR), a constituent Unit of the Department of Atomic Energy (DAE). Thorium based fuel has been manufactured and placed in the Advanced Heavy



## **Nuclear and Arms Control Centre**

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Water Reactor (AHWR) critical facility for Reactor Physics experiments as well. Further development of technologies for large scale commercial level manufacture and reprocessing of Uranium-233 bearing fuel is underway.

([http://www.dae.nic.in/writereaddata/rsus1242\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1242_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1243**  
TO BE ANSWERED ON 11.08.2011

### OPPOSITION TO NUCLEAR POWER PLANT AT JAITAPUR

1243. SHRIMATI HEMA MALINI:

SHRI PRABHAT JHA:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that local people have protested against Jaitapur Nuclear Power Plant Project in Maharashtra; and
- (b) if so, the details thereof and the decision taken by Government in view of this protest?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir. A section of the people from nearby areas have been protesting against setting up of the Jaitapur Nuclear Power Plant project in Maharashtra.
- (b) Their opposition is primarily on apprehensions about the project and nuclear power. In respect of the land acquisition, efforts are on to arrive at an acceptable rehabilitation package in consultation with the state government. The apprehensions are being addressed through sustained public awareness campaigns following a multi-pronged approach. Accelerated efforts are being made to engage the local communities and address their concerns in a credible manner.

([http://www.dae.nic.in/writereaddata/rsus1243\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1243_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1244**  
TO BE ANSWERED ON 11.08.2011

### **RULES FOR CIVIL NUCLEAR LIABILITY**

1244. SHRI RAM JETHMALANI:

SHRI RAVI SHANKAR PRASAD:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that Government has framed the rules to implement the Civil Liability for Nuclear Damage Law;
- (b) if so, the facts in this regard along with the details of these rules; and
- (c) whether as a result of such rules, the countries earlier opposing the original Nuclear Liability Damage Law are satisfied and willing to work with India?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)&(b) The Government is in the process of framing rules as provided under the Civil Liability for Nuclear Damage Act, 2010.

(c) Following the passage of the Civil Liability for Nuclear Damage Act, 2010, some potential suppliers have raised certain issues mainly relating to application of 'operators right of recourse' as provided in Section 17 and 'Act to be in addition to any other law' as provided in Section 46 of the Act.

The Government is taking necessary action to implement India's nuclear energy programme, including nuclear power projects in technical cooperation with other countries on the basis of the Civil Liability for Nuclear Damage Act, 2010.

([http://www.dae.nic.in/writereaddata/rsus1244\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1244_110811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1245**  
TO BE ANSWERED ON 11.08.2011

### URANIUM MINES IN ANDHRA PRADESH

1245. SHR I RAMCHANDRA PRASAD SINGH:

SHR I RAVI SHANKAR PRASAD:

Will the PRIME MINISTER be pleased to state:

- whether it is a fact that quantity of uranium reserve found recently in the uranium mines of Andhra Pradesh is being reassessed;
- if so, the quantity of uranium reserve available in the mines of Andhra Pradesh after reassessment; and
- the total quantity of uranium available in India after finding this uranium reserve, and the quantity of energy that can be generated through it?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy, has carried out assessment of insitu uranium resources in Tumulapalle area, Kadapa District, Andhra Pradesh and has established 63,269 tonnes of U<sub>3</sub>O<sub>8</sub> as on 30.06.2011 in the said area. Further exploration is on to establish additional resources in extension areas.
- The uranium reserves available in Andhra Pradesh are as follows:

NAME OF THE DEPOSIT IN ANDHRA PRADESH	TYPE OF DEPOSIT	URANIUM RESOURCES ESTABLISHED (TONNES U <sub>3</sub> O <sub>8</sub> )
LAMBAPUR	UNCONFORMITY	1450
PEDDAGATTU	UNCONFORMITY	7585
TUMMALAPALLE- RACHAKUNTAPALLE	STRATABOUND	63269
KOPPUNURU	UNCONFORMITY	2761
CHITRIAL	UNCONFORMITY	8473
TOTAL		83538

- AMD has so far established 1,71,672 tonnes of insitu uranium resources as on 30.06.2011. The currently known reserves of indigenous uranium in the country can support a nuclear programme with a generating capacity of about 10,000 MWe.

([http://www.dae.nic.in/writereaddata/rsus1245\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1245_110811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1246**  
TO BE ANSWERED ON 11.08.2011

### NUCLEAR POWER PLANT IN GUJARAT

1246. SHRI PARIMAL NATHWANI:

Will the PRIME MINISTER be pleased to state:

- (a) whether Government proposes to set up a 6000 MW capacity nuclear power plant in Bhavnagar district of Gujarat;
- (b) if so, the details thereof;
- (c) whether the villagers are against Government's move to acquire their fertile land to set up nuclear plant; and
- (d) if so, Government's stand on this issue?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) The Government has accorded 'in principle' approval for the site at Chhaya Mithi Virdi, Bhavnagar in Gujarat for setting up nuclear power plant of 6x1000 MW Light Water Reactors (LWRs). These reactors will be set up in phases based on international cooperation. In the first phase, two reactors, each of 1000 MW are planned to be launched in XII plan period. Currently, pre-project activities comprising land acquisition process, Environment Impact Assessment (EIA) and site evaluation studies are in progress.
- (c) Yes, Sir. A section of the villagers are opposing acquisition of land, mainly on apprehensions of loss of livelihood, rehabilitation and nuclear power safety.
- (d) An attractive Resettlement & Rehabilitation (R&R) package is being worked out in consultation with the Gujarat government. The apprehensions about nuclear power, safety, radiation and other aspects are being addressed through structured public awareness campaigns comprising of meetings with the villagers, state officials and other stake holders.

([http://www.dae.nic.in/writereaddata/rsus1246\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1246_110811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1247**  
TO BE ANSWERED ON 11.08.2011

### MISCONCEPTION ON JAITAPUR POWER PLANT

1247. SHRI PARIMAL NATHWANI:

Will the PRIME MINISTER be pleased to state:

- (a) whether there have been a lot of misconceptions on the proposed Jaitapur Power Plant in Konkan region of Maharashtra;
- (b) if so, the details thereof;
- (c) in what manner Government proposes to remove these misconceptions; and
- (d) the reasons for selecting this area of Western Ghats for a Nuclear Power Plant?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND  
IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) The apprehensions prevailing in Konkan region of Maharashtra are on safety of reactors, setting up of untested reactors, management of radioactive waste, impact of plant operation on ecology and bio-diversity, rehabilitation and livelihood.
- (c) The apprehensions are being addressed through sustained public awareness campaigns among various sections of the society which include school/college students and faculty, vernacular press and media, state officials, local MLAs and MPs, members of Non Government Organizations (NGOs)/Environment group, project affected persons (PAPs) and members of public around the Jaitapur site in Ratnagiri region. Till July 2011, 63 public awareness campaigns have been organized. These campaigns included interactive series of lectures, distribution of public awareness material in local language, meetings and briefings, scientific and technical displays / exhibitions in schools, colleges and public forums in the surrounding areas, press / media briefings, visits of local people, press and media to the nuclear power plants in operation and construction. An information centre equipped with the models, displays and literature in Marathi language on the project and nuclear power has also been made operational at Ratnagiri. The website of NPCIL also has extensive information about the Jaitapur project including several studies carried out indicating that the plants are safe. There have been many meetings held by the state and central government with those opposing the project, including the two meetings held by Chief Minister of Maharashtra. Former Chairman of the Atomic Energy Commission, Dr. Anil Kakodkar addressed the MLAs and MLCs of Maharashtra on the various aspects of the project and safety issues in March 2011.
- (d) The site at Jaitapur meets all the criteria for siting of nuclear power plants. The Site Selection Committee (SSC) of the Government recommended the site, offered by the state government, after thorough evaluation. Based on the recommendations of the SSC, Government of India approved Jaitapur site for the establishment of the nuclear power plant.

([http://www.dae.nic.in/writereaddata/rsus1247\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1247_110811.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1248**  
TO BE ANSWERED ON 11.08.2011

### STAFF STRENGTH IN THE DEPARTMENT

1248. SHRI AMBETH RAJAN:

Will the PRIME MINISTER be pleased to state:

- (a) the details of total sanctioned staff strength in the Department of Atomic Energy, group-wise i.e. Group A to Group D;
- (b) the number of jobs earmarked for SC/ST category as per Government of India's reservation policy out of the total strength; and
- (c) the reasons for the staff strength not being in accordance with the reservation policy of Government of India?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The details of total sanctioned staff strength in the Department of Atomic Energy, group-wise i.e. Group A to Group D are

Group A	Group B	Group C	Group D	Total
10160	11504	15160	70	36894

- (b) The number of jobs earmarked for SC/ST category as per reservation policy and in position are:

Group	Scheduled Castes		Scheduled Tribe	
	Earmarked	In position	Earmarked	In position
Group A *	205	210	98	50
Group B	1755	1773	787	549
Group C	1884	2585	1245	1285
Group D	9	10	4	14

\*The Department is exempted from the purview of reservations for SC/ST in respect of "Scientific and Technical" posts recruited through the Training School for conducting research and for organizing, guiding and directing research.  
([http://www.dae.nic.in/writereaddata/rsus1248\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1248_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1249**  
TO BE ANSWERED ON 11.08.2011

### FINNISH TECHNOLOGY FOR JAITAPUR NUCLEAR POWER PLANT

1249. SHRI Y.S. CHOWDARY:

Will the PRIME MINISTER be pleased to state:

- (a) whether Government is planning to introduce Finnish technology for Jaitapur Nuclear Power Plant;
- (b) if so, the details thereof;
- (c) whether this technology has ever been used in India; and
- (d) whether Finnish technology would ensure nuclear safety?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) No, Sir.
- (b) does not arise.
- (c) No, Sir.
- (d) The nuclear power reactors planned to be set up at Jaitapur are not based on Finnish technology but are 1650 MW evolutionary pressurised water reactors (EPRs) developed by Areva, France. The EPR design has been evolved from the several years' operational feedback of N4 reactors in France and KONVOI reactors in Germany. The first EPR is under construction in Finland. EPRs are also under construction in France and China. The EPRs have not been set up in India earlier. The EPRs are reactors with advanced safety features, which include four independent safety trains housed in independent seismically qualified buildings, a core catcher, passive core cooling provisions which will ensure cooling of the fuel even in the worst case of fuel melt down thus preventing radioactivity releases, and hydrogen re-combiners to prevent hydrogen explosion.

([http://www.dae.nic.in/writereaddata/rsus1249\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1249_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1250**  
TO BE ANSWERED ON 11.08.2011

### THORIUM RESERVES IN COASTAL AREAS

1250. SHRI RAJIV PRATAP RUDY:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that reserves of thorium mineral in Indian coasts are still left unused while it has been scientifically established as a replacement to produce nuclear energy;
- (b) the plans with Government to ensure that the thorium reserves in Indian coastal areas are put to optimum use for the greater welfare of people;
- (c) the bottleneck faced by Government to utilise thorium based reactors for power generation;
- (d) the amount of money that has been spent so far for developing such technology; and
- (e) the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND  
IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)&(b) Thorium, being a fertile material, needs to be converted into fissile U-233 before it can be used as a nuclear fuel. Right from the inception of the Indian nuclear programme, work has been carried out in various aspects of thorium technology, viz., mining and extraction of thorium, processing of thorium into fuel, irradiation of thorium bearing fuel in reactors and reprocessing of spent fuel containing thorium.

- ❖ Studies have been carried out at laboratory scale regarding use of thorium in different types of reactors with respect to fuel management, reactor control and fuel utilization.
  - ❖ To get industrial scale experience in the use of thorium, BARC is designing an Advanced Heavy Water Reactor (AHWR). This reactor will demonstrate various aspects of thorium fuel technology at industrial scale.
  - ❖ A Critical Facility for Advanced Heavy Water Reactor has been commissioned in 2008 and is being used for carrying out experiments to further validate the physics design features of Advanced Heavy Water Reactor.
- (c) Large scale introduction of thorium in power generation is possible only after sufficient capacity of fast reactors is built in the country. Today, the first Prototype Fast Breeder Reactor (PFBR) is under construction, which is expected to be commissioned in 2012.
- (d)&(e) Funds have been utilized on various research and development projects related to mining and extraction of thorium, fuel fabrication, irradiation in reactors, reprocessing and refabrication of fuel.

A major part of the expenditure was incurred for design and development of Advanced Heavy Water Reactor (AHWR), which will serve as a technology demonstrator for a range of technologies for Thorium utilization as well as for several advanced safety features that have been incorporated in the design of this reactor. The total amount spent on this activity is Rs.230 cr.

([http://www.dae.nic.in/writereaddata/rsus1250\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1250_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1251**  
TO BE ANSWERED ON 11.08.2011

### SAFETY OF NUCLEAR PLANTS

1251 DR. JANARDHAN WAGHMARE :

Will the PRIME MINISTER be pleased to state:

- (a) whether most of the Nuclear Plants in the country are ill-equipped in so far as safety and security aspects are concerned;
- (b) if so, the details thereof;
- (c) whether the recommendations made by the task forces set up by the Nuclear Power Corporation of India Limited (NPCIL) have been accepted; and
- (d) if so, the roadmap of implementing the recommendations of the task forces set up by NPCIL?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) No, Sir.

(b) Safety is accorded highest priority in all phases, siting, design, construction, commissioning, operation and de-commissioning of nuclear power plants in the country. The Indian nuclear power reactors employ state of the art systems at par international standards. Indian nuclear power plants have demonstrated over 340 reactor-years of safe operation and there has been no instance of release of radioactivity in the public domain or breach of security. Further, safety being a moving target which is continually evolving, regular reviews of incidents at national and international levels and incorporation of lessons learnt from these, as appropriate, are inbuilt in safety culture at Indian nuclear power plants. Periodic reviews on safety status at Indian nuclear power plants are carried out independently by the Atomic Energy Regulatory Board (AERB). The recommendations arising out of these reviews are also implemented scrupulously.

(c)&(d) The recommendations of NPCIL taskforces are already under implementation and others are in process of clearance / approval of AERB. The road map for implementation of the recommendations has been placed in the public domain on the websites of NPCIL and DAE.

([http://www.dae.nic.in/writereaddata/rsus1251\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1251_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 1252**  
TO BE ANSWERED ON 11.08.2011

### **DILUTION OF CIVIL NUCLEAR LIABILITY ACT**

1252. SHRI M.P. ACHUTHAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that US Secretary of State Hillary Clinton had demanded dilution of the Civil Nuclear Liability Act asking India to engage with the International Atomic Energy Agency (IAEA) to ensure that the nuclear liability law fully conform with the Convention of Supplementary Compensation for Nuclear Damage (CSC); and
- (b) if so, the details thereof and Government's reaction thereto?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)&(b) During the recent visit of the Hillary Clinton, Secretary of State, USA to India in July 2011, both sides reiterated their continued commitment for full implementation of the Indo-US civil nuclear energy cooperation agreement. The United States of America has ratified the Convention on Supplementary Compensation (CSC) and India intends to ratify the CSC within this year. India is committed to ensuring a level playing field for U S Companies seeking to enter the Indian nuclear energy sector, consistent with India's national and international legal obligations.

([http://www.dae.nic.in/writereaddata/rsus1252\\_110811.pdf](http://www.dae.nic.in/writereaddata/rsus1252_110811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 141**  
TO BE ANSWERED ON 10.08.2011

### CIVIL NUCLEAR AGREEMENTS

\*141. DR. M. THAMBIDURAI:

Will the PRIME MINISTER be pleased to state:

- (a) the names of the countries with whom India has signed civil nuclear agreements;
- (b) whether India has signed a similar agreement with Kazakhstan;
- (c) if so, the details thereof;
- (d) whether the agreement gives the Indian reactors access to uranium from the central Asian country;
- (e) if so, the details thereof; and
- (f) the benefits that are likely to accrue to India from such agreements?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) to (f) A statement is laid on the Table of the House.

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STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO.141 FOR ANSWER ON 10.08.2011 BY DR. M. THAMBIDURAI ON CIVIL NUCLEAR AGREEMENTS

- (a) Following the decision of the Nuclear Suppliers Group (NSG) on 6 September 2008 to relax its guidelines to permit civil nuclear cooperation, India has entered into agreements for peaceful uses of nuclear energy with France, USA, Russia, Namibia, Mongolia, UK, Canada, Argentina, Kazakhstan and Republic of Korea. The agreement between the Government of the Republic of India and the Government of the erstwhile Czechoslovak Socialist Republic on Cooperation in the field of the use of nuclear energy for peaceful purposes signed in November, 1966 has been revalidated for cooperation with the Czech Republic in November, 2010.
- (b) Yes Sir.
- (c) An Agreement between the Government of the Republic of India and the Government of the Republic of Kazakhstan for Cooperation in the Peaceful Uses of Nuclear Energy was signed on 16.04.2011. The Agreement has not yet come into force.
- (d)to(f) The objective of the Agreement with Kazakhstan is to establish a legal framework for mutually beneficial cooperation in the peaceful uses of nuclear energy including exploration and mining of uranium and other natural resources relevant to the exploitation of nuclear energy.

([http://www.dae.nic.in/writereaddata/lssq141\\_100811.pdf](http://www.dae.nic.in/writereaddata/lssq141_100811.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 147**  
TO BE ANSWERED ON 10.08.2011

### URANIUM DEPOSITS

\*147. SHRI BHARTRUHARI MAHTAB  
SHRI RUDRA MADHAB RAY

Will the PRIME MINISTER be pleased to state:

- (a) the estimated reserves and exploitation of uranium deposits/resources in various mines in the country;
- (b) whether a uranium mine in Tumulapalli of Andhra Pradesh has been discovered recently;
- (c) if so, the details thereof including the estimated quantum of uranium reserves found and the extent to which it is likely to meet the demand of the country's nuclear programme;
- (d) whether the Government has sufficient infrastructure for its utilization;
- (e) if so, the details thereof including the manner in which it is likely to be utilized; and
- (f) the expected time by which the production from this mine is likely to be started and the extent of foreign exchange likely to be saved as a result of reduction of uranium imports?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) to (f) A statement is laid on the Table of the House:

STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION  
NO.147 BY SHRI BHARTRUHARI MAHTAB AND SHRI RUDRA MADHAB RAY  
REGARDING URANIUM DEPOSITS FOR ANSWER ON 10.08.2011

- (a) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy (DAE) has established the presence of 1,71,672 tonnes of Uranium resources (insitu) as on 30.06.2011. The Uranium Corporation of India Ltd. (UCIL), a Public Sector Undertaking of this Department, mines the uranium required for the Pressurized Heavy Water Reactors. The estimated reserves in the operating mines are shown below:

Status	Mines / Deposits	Ore in million Tonnes
Operating units	Jaduguda, Jharkhand	1.93
	Bhatin, Jharkhand	1.43
	Narwapahar, Jharkhand	10
	Turamdih, Jharkhand	12
	Banduhurang, Jharkhand	25
	Bagjata, Jharkhand	3.97

## Nuclear and Arms Control Centre

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- (b) Yes, Sir, a uranium reserve has been discovered in Tummalapalle, Kadapa Dist., Andhra Pradesh.
- (c) In Tumallapalle, Kadapa District, Andhra Pradesh, AMD has established the presence of 63,269 tonnes of Uranium (U<sub>3</sub>O<sub>8</sub>). The currently known reserves of indigenous uranium in the country can support a nuclear programme with a generating capacity of about 10,000 MWe.
- (d) Yes, Sir.
- (e) The UCIL has already taken up a plan to construct a mine and a mill in the area and the uranium produced therein shall be used in the indigenous nuclear power programme.
- (f) Commissioning of the underground mine and the mineral processing plant of 3000 tpd ore capacity is expected in the year 2012. Pre-project activities for augmenting the production and processing capacity to 4500 tpd ore are in progress and the project is expected to be commissioned in the year 2015. Further plan has been envisaged to construct another mine and enhance the capacity of the mineral processing plant to 6000 tpd capacity after successful commissioning of the ongoing project. The indigenous uranium will help India to increase nuclear installed capacity thereby providing more electricity for economic growth of the country.
- ([http://www.dae.nic.in/writereaddata/lssq147\\_100811.pdf](http://www.dae.nic.in/writereaddata/lssq147_100811.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1714**  
TO BE ANSWERED ON 10.08.2011

### URANIUM RESERVES

1714. SHRI KACHHADIA NARANBHAI:

Will the PRIME MINISTER be pleased to state:

- (a) the existing deposits of usable uranium in the country;
- (b) the per specialist quantum of uranium required to continue the present atomic power generation;
- (c) the authentic deposits of uranium being explored and the status of the exploration; and
- (d) the probable deposits of the uranium which is yet to be explored for commercially viable production?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy has established the presence of 1,71,672 tonnes of Uranium (U308 ) as on 30.06.2011.
- (b) The indigenous uranium resources are adequate to fuel reactors of the capacity of about 10,000 MWe.
- (c) At present AMD is exploring uranium deposits at Tumallapalle-Rachkuntapalle, Kadapa District (Andhra Pradesh), Rohil, Sikar District (Rajsasthan), Wahkut and Umthungkut (Meghalaya), Gogi, Gulburga District (Karnataka), Singridungri-Banadungri and Bangurdih, Singhbhum District (Jharkhand). Out of these deposits, 63,269 tonnes of uranium resources Uranium (U308) have been established during the XI Plan Period. In Rohil, the Exploratory Drilling done till date has established 5,100 tonnes of Uranium (U308). In Meghalaya, about 19,738 tonnes of Uranium (U308) has been established. In Gogi, 4,682 tonnes of Uranium (U308 ) has been established. In Jharkhand, about 50,978 tonnes of Uranium (U308 ) has been established.
- (d) There are number of smaller deposits in parts of Chhattisgarh basin, Bundelkhand Craton and Kaladgi Basin areas located at Chhattisgarh, Uttar Pradesh and Karnataka which are yet to be explored.

([http://www.dae.nic.in/writereaddata/1714\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1714_lsus100811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1725**  
TO BE ANSWERED ON 10.08.2011

### **FAST BREEDER REACTOR**

1725. SHRI ANAND PRAKASH PARANJPE:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has plans to set up Fast Breeder Reactors for commercial nuclear energy generation;
- (b) if so, the details thereof alongwith their location and the funds allocated for these reactors;
- (c) whether these projects are not being completed timely;
- (d) if so, the details thereof and the reasons therefor;
- (e) whether these projects are indigenous or a joint venture;
- (f) if so, the details thereof; and
- (g) the time by which these reactors are likely to be commissioned?

### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
  - (b) A 500 MWe Prototype Fast Breeder Reactor (PFBR) is being built at Kalpakkam near Chennai in Tamilnadu with a project cost of 3492 crore. A proposal for upward revision of cost is under consideration. Further 250 crore have been allocated for pre-project activities of two more units at the same site.
  - (c)&(d) Yes, Sir. The project is delayed due to the initial setback in construction activities due to Tsunami and in later stages due to technological complexities in manufacturing several first of a kind equipment.
  - (e)&(f) The PFBR is an advanced technology reactor designed and built indigenously.
  - (g) The plant is expected to be commissioned in 2012.
- ([http://www.dae.nic.in/writereaddata/1725\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1725_lsus100811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1739**  
TO BE ANSWERED ON 10.08.2011

### **PROTEST AGAINST NUCLEAR LIABILITY LAW**

1739. SHRI ARJUN RAY:

SHRI ANANT KUMAR HEGDE:

Will the PRIME MINISTER be pleased to state:

- (a) whether several global atomic energy companies have registered their protest against the Nuclear Liability Law of India;
- (b) if so, the details thereof and the reasons for opposing the said Law;
- (c) whether in view of the said protests, the Government has taken any decision to enforce rules relating to the said Law; and
- (d) if so, the details of the said rules in this regard?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) & (b) Following the passage of the Civil Liability for Nuclear Damage Act, 2010, some potential suppliers have raised certain issues mainly relating to application of 'operators right of recourse' as provided in Section 17 and 'Act to be in addition to any other law' as provided in Section 46 of the Act.
- (c) & (d) The Government is taking necessary action to implement India's nuclear energy programme, including nuclear power projects in technical cooperation with other countries on the basis of the Civil Liability for Nuclear Damage Act, 2010. The Government is also in the process of framing rules as provided under the said Act.

([http://www.dae.nic.in/writereaddata/1739\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1739_lsus100811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1758**  
TO BE ANSWERED ON 10.08.2011

### AVAILABILITY OF THORIUM

1758. ADV. GANESHRAO DUDHGAONKAR:

Will the PRIME MINISTER be pleased to state:

- (a) whether sufficient quantity of thorium reserves are available in the country which has the potential to serve as feedstock for an ambitious nuclear power programme;
- (b) if so, the details thereof; and
- (c) the steps taken/proposed to be taken to extract thorium and utilize it for our nuclear power programme?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) Yes, Sir.

(b) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy has established 10.70 million tonnes of Monazite in the country, which contains 9,63,000 tonnes of Thorium Oxide (ThO<sub>2</sub>). Indian Monazite contains about 9-10% of ThO<sub>2</sub> and about 8,46,477 tonnes of Thorium Metal can be obtained from 9,63,000 tonnes of ThO<sub>2</sub> which will be used for future programmes of DAE.

India is pursuing a three stage nuclear power generation programme aimed at long term energy independence based on use of our abundant Thorium resources. The programme is to use Thorium for electricity generation in the long-term. In order to realize this goal, we are well into the first stage based on our modest domestic Uranium resources. This will be followed by second stage comprising of fast reactors. It is proposed to set up a large power generation capacity based on fast reactors before getting into the third stage. Thorium in itself cannot produce electricity and it has to be first converted to

Uranium-233 in a nuclear reactor. A comprehensive three-stage nuclear power programme is therefore being implemented sequentially.

- (b) India has been working on the development of technologies for Utilisation of Thorium for Nuclear Power Generation since the inception of the Indian Nuclear Programme. As a part of this work, thorium has been irradiated in our Research Reactors and also in Pressurised Heavy Water Reactors. Technologies for reprocessing of irradiated thorium fuel for the separation of Uranium-233 have also been developed on a pilot plant scale. Uranium-233 thus separated has been used as fuel in research reactor Purnima-II and later in the 30 Kw Research Reactor Kamini now in operation at Indira Gandhi Centre for Atomic Research (IGCAR), a constituent Unit of the Department of Atomic Energy (DAE). Thorium based fuel has been manufactured and located in the Advanced Heavy Water Reactor (AHWR) critical facility for Reactor Physics experiments as well. Further



## **Nuclear and Arms Control Centre**

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development of technologies for large scale commercial level manufacture and reprocessing of Uranium-233 bearing fuel is underway.

([http://www.dae.nic.in/writereaddata/1758\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1758_lsus100811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1759**  
TO BE ANSWERED ON 10.08.2011

### CIVIL NUCLEAR COOPERATION

1759. SHRI FRANCISCO SARDINHA:

Will the PRIME MINISTER be pleased to state:

- (a) whether the civil nuclear cooperation deal between India and France has come into force;
- (b) if so, the details thereof; and
- (c) the extent to which India will be benefited by the implementation of the said deal?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) & (b) Yes Sir. The agreement between the Government of the Republic of India and the Government of the French Republic on the Development of Peaceful Uses of Nuclear Energy signed on 30.09.2008 has entered into force with effect from 14.01.2010.
- (c) The Agreement with France is a general agreement covering wide areas including nuclear reactors, nuclear fuel and nuclear fuel cycle management to be followed by specific agreements between the Parties or persons designated by the Parties, provides for technology transfer on industrial or commercial scale between the Parties or designated persons. It also provides for facilitating fuel supplies for the lifetime operation of supplied nuclear power plants, establishment of long-term contracts between designated entities of the Parties, developing a strategic reserve of nuclear fuel and reprocessing consent.

([http://www.dae.nic.in/writereaddata/1759\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1759_lsus100811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1819**  
TO BE ANSWERED ON 10.08.2011

### ACTINIDES IN SPENT NUCLEAR FUEL

1819. SHRI RAVNEET SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether the actinides contained in the spent nuclear fuel are potentially a valuable resource; and
- (b) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) Yes, sir.

(b) The following are the Actinides present in the nuclear fuel :

- (i) Major actinides which include Uranium and Plutonium.
- (ii) Minor actinides which include Neptunium, Americium and Curium.

Major actinides are most valuable resources for our nuclear power programme and for strategic applications whereas minor actinides have medical, industrial and strategic applications.

([http://www.dae.nic.in/writereaddata/1819\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1819_lsus100811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1824**  
TO BE ANSWERED ON 10.08.2011

### COMMITTEE ON CONSTITUTIONAL PERMISSION

1824. SHRI ASHOK KUMAR RAWAT:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government proposes to constitute any Committee to keep a check on Constitutional permission given by the State and Central authorities regarding discovery and research related to nuclear minerals including raw material;
- (b) if so, the details thereof;
- (c) whether the Directorate of Atomic Energy is responsible for ascertaining discovery and research regarding nuclear minerals; and
- (d) if so, the progress made regarding the aforesaid Committee?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) No, Sir.
- (b) does not arise.
- (c) Yes Sir. The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of Department of Atomic Energy, is engaged in survey and exploration for uranium and other atomic minerals viz. thorium, niobium, tantalum and beryl, required for the Nuclear Power Programme of the country.
- (d) Not applicable in view of (a) above.

([http://www.dae.nic.in/writereaddata/1824\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1824_lsus100811.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1827**  
TO BE ANSWERED ON 10.08.2011

### RADIATION EMERGENCY RESPONSE CENTRES

1827. DR. KRUPARANI KILLI:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has set up/ proposes to set up a network of radiation emergency response centres in different parts of the country to deal with nuclear emergency situations;
- (b) if so, the details thereof alongwith the cost involved, location-wise;
- (c) the benefits likely to be accrued as a result thereof; and
- (d) the time by which such centres are likely to be made operational in the country, location-wise?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) Yes, sir.

- (b) The Government has set up twenty Emergency Response Centres (DAE-ERCs) at the Department of Atomic Energy (DAE) locations. These have been developed to be in preparedness for response to any nuclear and radiological emergencies affecting the public domain. The ERCs are also meant to provide appropriate advice to the administration/local security agencies regarding the counter/rescue measures etc., required in the event of any radiation field / contamination in public domain either due to any accident or by deliberate acts. It is proposed to establish 10 more ERCs - 2 more at DAE sites and 8 at National Disaster Response Force (NDRF) sites.

Training of the "First Responders" from NDRF on "Response to nuclear/radiological emergencies" is also conducted by the ERCs.

The Emergency Response Centres (ERCs) are equipped with various radiation monitoring systems for quick assessment of the radiological status by the Emergency Response Teams (ERTs) comprising of Radiation Safety Experts of the DAE. Total cost incurred in establishing 20 ERCs including training of ERTs is ` 12 crore, with annual maintenance of these ERCs is ` 30 lakhs.

- (c) This will strengthen emergency preparedness and response capability at National level and will enable the first responders from NDRF/Police or any other agencies to get proper advice and guidance in the event of any nuclear and radiological emergency in public domain.

(d) Details of 20 ERCs, already fully operational, are as follows:

1. Bhabha Atomic Research Centre, (BARC), Mumbai, Maharashtra
2. Tarapur Atomic Power Station (TAPS), Tarapur, Maharashtra
3. Kakrapar Atomic Power Station (KAPS), Kakrapar, Gujarat,

## Nuclear and Arms Control Centre

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4. Kaiga Generating Station (KGS), Kaiga, Karnataka
5. Rajasthan Atomic Power Station (RAPS), Kota, Rajasthan
6. Atomic Minerals Directorate for Exploration and Research (AMD), Jaipur, Rajasthan
7. Narora Atomic Power Station (NAPS), Narora, Uttar Pradesh
8. Indian Rare Earths Limited (IREL), Aluva, Kerala
9. Uranium Corporation of India Limited (UCIL), Jaduguda, Jharkhand
10. Variable Energy Cyclotron Centre (VECC), Kolkatta, West Bengal
11. Atomic Minerals Directorate for Exploration and Research (AMD), Shillong, Meghalaya
12. Atomic Minerals Directorate for Exploration and Research (AMD), Nagpur, Maharashtra
13. Nuclear Fuel Complex (NFC), Hyderabad, Andhra Pradesh
14. Madras Atomic Power Station (MAPS), Kalpakkam, Tamilnadu
15. Atomic Minerals Directorate for Exploration and Research (AMD), Bengaluru, Karnataka
16. Raja Ramanna Centre for Advance Technology (RRCAT), Indore, Madhya Pradesh
17. Atomic Minerals Directorate for Exploration and Research (AMD), Delhi, NCT
18. Kudankulam Nuclear Power Plant (KKNPP), Kudankulam, Tamilnadu
19. Rare Materials Project (RMP), Mysore, Karnataka
20. Institute for Plasma Research (IPR), Gandhinagar, Gujarat

Additional ERCs are proposed at 10 locations and are likely to be operational within 1-2 years. Locations of proposed DAE-ERCs are:

1. Chatrapur, Orissa
2. Visakhapatnam, Andhra Pradesh

### Locations of proposed NDRF ERCs

1. Kolkata, West Bengal
2. Arakkonam, Tamilnadu
3. Pune, Maharashtra
4. Ghaziabad, Uttar Pradesh
5. Guwahati, Assam
6. Mundali, Orissa
7. Gandhinagar, Gujarat
8. Bhatinda, Punjab

([http://www.dae.nic.in/writereaddata/1827\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1827_lsus100811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1837**  
TO BE ANSWERED ON 10.08.2011

### **AIDED INSTITUTIONS**

1837. SHRI RADHE MOHAN SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) the details of the aided institutions of the Department of Atomic Energy alongwith the plan and non-plan funds allocated to these institutions during the last three years and the current year;
- (b) the achievements made by these institutions during the aforesaid period, institution-wise;
- (c) whether their achievements are at par with the achievements made by similar international institutions; and
- (d) if so, the details thereof?

### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Details are given in Annexure-1
- (b) to (d) Details are given in Annexure-2

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### Annexure-1

The Aided Institutions under DAE are:

1. Tata Institute of Fundamental Research (TIFR), Mumbai
2. Tata Memorial Centre (TMC), Mumbai
3. Saha Institute of Nuclear Physics (SINP), Kolkata
4. Institute of Physics (IoP), Bhubaneswar
5. Institute of Mathematical Sciences (IMSc), Chennai
6. Harish Chandra Research Institute (HRI), Allahabad
7. Institute for Plasma Research (IPR), Gandhinagar
8. National Institute of Science, Education and Research (NISER), Bhubaneswar
9. Atomic Energy Education Society (AEES), Mumbai

Details of Grants given to Aided Institutions under DAE for the period 2008-09 to 2011-12 under Plan and Non-Plan

In crore

Sr. No.	Years	Aided Institutions								
		TIFR	TMC	SINP	IOP	IMS	HRI	IPR	NISER	AEES
1	2008-09									
	Plan	149.69	66.05	60.39	38.90	8.46	5.71	144.99	0.00	14.60
	Non Plan	148.00	112.18	41.63	12.99	16.22	12.97	37.60	0.00	39.59
	Total	297.69	178.23	102.02	51.89	24.68	18.68	182.59	0.00	54.19
2	2009-10									
	Plan	168.32	56.25	81.50	14.00	3.62	9.00	250.00	32.00	12.90
	Non Plan	198.05	140.79	52.67	14.54	21.18	14.32	48.30	0.00	34.64
	Total	366.37	197.04	134.17	28.54	24.80	23.32	298.30	32.00	47.54
3	2010-11									
	Plan	196.11	77.17	70.00	5.49	2.50	6.00	338.00	23.00	10.00
	Non Plan	195.00	217.60	46.90	12.47	25.00	14.43	44.63	0.00	32.74
	Total	391.11	294.77	116.90	17.96	27.50	20.43	382.63	23.00	42.74
4	2011-12 * (in progress)									
	Plan	325.00	80.00	60.00	15.00	2.00	15.00	515.00	210.00	15.00
	Non Plan	206.90	213.80	58.00	16.10	26.00	15.80	49.48	0.00	54.04
	Total	531.90	293.80	118.00	31.10	28.00	30.80	564.48	210.00	69.04

#### Budget Estimates

The Department of Atomic Energy has been funding nine Aided Institutions which are primarily research and education institutions. These Institutions are an integral part of the Department in as much as there is a growing synergy between these institutions and the Research and Development Units of the Department. Several joint projects have been undertaken between the Units and Aided Institutions and there is frequent interaction between the academicians of the aided institutions and the scientists of the R&D Units. These institutions are dedicated to fundamental / basic research and academic activities and have been fountainhead of knowledge and its applications in disciplines of interest to the Indian Atomic Energy Programme. They have excelled themselves at International level. The R&D works carried out by these institutions get published in reputed National and International Journals regularly and are well acclaimed. They are also cited as reference materials.

Some important achievements of the nine Institutions during the last three years, institution wise, are given hereunder:

#### **Tata Institute of Fundamental Research (TIFR), Mumbai**

- ❖ Publication of around 1500 scientific papers in journals, 500 papers in proceedings, and 100 in books/chapters during the last three years
- ❖ Enrolling 247 Ph.D, 61 Integrated Ph.D. and M.Sc. students between 2008-2009 to 2010-2011
- ❖ Homi Bhabha Centre for Science Education (HBCSE) is the nodal institute for the International Science Olympiads and Indian students trained at the HBCSE orientation camps have won 25 gold medals between 2008 to 2010.
- ❖ Foundation of a new campus of TIFR and a new Centre for Interdisciplinary Sciences (TCIS) in Hyderabad.
- ❖ Participation of TIFR, as host Institute, in the large multi-institutional project to establish the India-based Neutrino Observatory (INO) in Tamilnadu.
- ❖ Setting up of the International Centre for Theoretical Sciences (ICTS) at Bengaluru.
- ❖ Three high end instruments Large Area Xenon Proportional Counter (LAXPC), Cadmium Zinc Telluride Imager (CZTI) and Soft X-ray Telescope (SXT) for the Indian Astronomy satellite ASTROSAT to be launched in 2012 are undergoing final tests.
- ❖ A five teraflop IBM blue-gene supercomputer facility was set up and reliable estimates of the crossover temperature and critical point in quantum chromodynamics were computed to provide important guides to the design of experiments worldwide.
- ❖ A novel optical design allowed Bose-Einstein condensates of cold atoms to form, and optical lattices to hold very large numbers of atoms
- ❖ In the biological sciences, exquisitely sensitive light microscopy was used to show how domains of proteins are organized on the membrane of the cell, leading to long-range signalling capability.
- ❖ In mathematics, work done on the geometry of moduli spaces was a substantial advance in the field. The existence and qualitative properties of solutions of partial

## Nuclear and Arms Control Centre

differential equations were established in a number of cases in Euclidean and other geometries

- ❖ In computer science, work on algebraic complexity revealed fundamental problems in traditional approaches. A new architecture was proposed to overcome the analog-to-digital conversion bottleneck for multi-gigabit wireless networks.
- ❖ In theoretical physics, a profound connection was established between the classical theory of gravity and the Navier-Stokes equations of fluid dynamics.

### Tata Memorial Centre (TMC), Mumbai

- ❖ Internationally well recognized cancer treatment institution, having received awards from several international/national fora
  - Express Healthcare Excellence Awards 2008.
  - CFBP Jamnalal Bajaj Uchit Vyavahar Puraskar, 2009.
  - Gloden Peacock Innovation Award for the year 2010 for Tata Memorial Centre - 2010
  - The Zee News Swastha Bharat Samman was conferred upon Tata Memorial Hospital in the special category 'healing with human touch'. – 2010.
  - International Peer Review 2010
  - In a year on an average TMC handles 50000 new cases and 3,50,000 follow-up cases
- ❖ Investments in clinical research has resulted in path breaking outcome that has the capability of saving thousands of lives in India and globally at a minuscule cost of 100/- (presented at the prestigious San Antonio meeting held in 2009-10 and published in the leading publication, Journal of Clinical Oncology 2011).
- ❖ Using indigenous Telecobalt machine “Bhabhatron-II” manufactured in conjunction with BARC, treated more than 16000 patients. This machine has been donated to Vietnam, Srilanka and other developing countries through IAEA.
- ❖ Contributing to more than 60% of national oncology human resources and presently have more than 100 students annually trained in Oncology and allied specialties.
- ❖ Running the world’s largest single screening trial testing low cost implementable technology for early detection of Breast and Cervical cancers in women supported by NCI, USA as a model intervention for developing world.
- ❖ Developing affordable stainless steel implant TMH-NICE, designed for Indian anthropometric parameters in collaboration with a local implant manufacturer, which is available at one tenth of the cost of the imported prosthesis (USD 10,000 – 30,000).
- ❖ The largest number of bone-marrow transplants for oncology being performed for poor and middle class patients.
- ❖ Department of Cytopathology developed an innovative, easy rapid and inexpensive alternative technology DAM that is at par with Liquid Base Cytology (LBC) and costs only 2/- per test.
- ❖ TMC District Cancer Control Programme has been featured in the UICC International Union Against Cancer Manual to become a bench mark model Cancer Control Programme
- ❖ The institute has around 350 on going research projects and more than 1200 publications

## **Nuclear and Arms Control Centre**

### **Saha Institute of Nuclear Physics (SINP), Kolkata**

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SINP, with its 130 faculty members, 160 research fellows and associates, is engaged in research in advanced scientific fields viz., Condensed Matter Physics, Material Physics, Nuclear Physics, High Energy Physics and Microelectronics, Theoretical Physics as well as Biophysical Sciences.

Scientists in SINP have contributed in 1050 research publications in the past four years and 70 thesis awarded for Ph.D degrees during this period.

The areas in which SINP scientists have made important contributions are as follows:

- ❖ Biophysical Science including Chemistry - Under this the fields covered are Biophysics, Crystallography, Molecular Biology, Chemical Science, Structural Genomics and Electron Microscope
- ❖ Condensed Matter Physics including Surface Physics and Nano-science – This field mainly consists of theoretical and condensed matter physics and applied material science.
- ❖ Experimental nuclear and particle physics – comprising of nuclear physics and particle physics
- ❖ Plasma Physics and Electronics
- ❖ Theoretical physics including mathematics comprising of theory and astro-particle physics and cosmology

The institute is contributing in academic output by running vibrant Ph.D. programme and also short term training programmes for Summer Projects for graduate students as well as an Undergraduate Associateship Programme.

### **Institute of Physics (IoP), Bhubaneswar**

- ❖ Carrying out research work on the effect of random force on a double-stranded DNA in unzipping its two strands attracting a lot of attention in the International community.
- ❖ Several new theoretical models have been proposed to enhance the efficiency of nanomachines and engines at nanoscale. Some of them were experimentally verified in international laboratories.
- ❖ Several important studies were performed on interacting many body systems such as traffic flows, data transmission over a network, and granular materials.
- ❖ IoP is a hub of energetic ion beam induced materials research in the country
- ❖ A new ion beam analysis end station has been established for depth profiling of hydrogen to uranium which is unique in the country.
- ❖ Establishing state-of-the-art facilities for pursuing cutting edge materials research,
- ❖ catering to the needs of several institutions and universities across India.

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- ❖ Prediction of a new model of fission decay, viz., multi fragmentation fission which will have enormous applications in future nuclear energy production
- ❖ Publication of around 242 research papers, which is very significant.

### **Institute of Mathematical Sciences (IMSc), Chennai**

- ❖ Internationally recognized Mathematical Research Institute, doing research in the areas of Mathematics, spanning number theory, algebraic geometry, mathematical physics, non-comutative geometry and topology – attracting a significant number of bright Ph.D. students to its programmes
- ❖ Continued research and education programmes in the field of Theoretical Physics, Mathematics and Theoretical Computer Science, scientific subjects covering a wide range of fields from understanding the structure of the universe to understanding how small organisms such as bacteria swim.
- ❖ Publication of around 282 scientific papers, mainly in the international journals
- ❖ Recognition received by IMSc faculty includes Bhatnagar Award, Fellowships of National Science Academy, Plenary Lecture at the International Congress of Mathematicians (ICM 2010), the award of the Chevalier de l'Order of Merit of the French Government

### **Institute for Plasma Research (IPR), Gandhinagar**

- ❖ Undertakes research in fundamental plasma science, its applications and fusion research, contributed immensely as demonstrated through publications in peer-reviewed, reputed journals and doctoral theses.
- ❖ India's joining of International Thermonuclear Experimental Reactor (ITER) programme at Cadarache, France
- ❖ India's joining a select club of nations who will carry out a unique experiment on ITER to prove fusion-blanket technology, which will help accelerate the indigenous development of fusion based power plants.
- ❖ Indigenous development of Reduced Activation Ferritic Martensitic Steel (RAFMS)
- ❖ Conducting several international collaborative programmes and exchange programmes.

### **Harish Chandra Research Institute (HRI), Allahabad**

- ❖ HRI carries out research in the fields of Mathematics, especially in the areas of algebra, theory group and group rings, representation theory and infinite dimensional Lie algebra. In the field of physics research work is carried out on astrophysics, condensed matter physics, quantum information and computing, high energy phenomenology and string theory.



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- ❖ The research papers published from the Institute are well recognized and a good number of researchers/scientists are recipients of SS Bhatnagar Awards and are Members of the National Science Academies. The publications of this Institute have high impact factor with high average citation for the publications are very high. The total number of publications in Mathematics is 66 and 294 in physics in the last three years.

### **Atomic Energy Education Society (AEES), Mumbai**

- ❖ Under AEES there are 30 Schools/Jr.College imparting education to the children/wards of DAE employees at different DAE/NPCIL sites.
- ❖ The results of AEES for 10th standard CBSE Board are best in the country for last three years and every year on an average about 500 students get admission in professional institutes of high repute.
- ❖ AEES also has international collaboration for student exchange programme in Singapore Schools and teachers exchange programme with a few schools in UK.
- ❖ AEES provides academic support for Indian students at Monasque, France under ITER programme.
- ❖ Introduction of innovative schemes and providing facilities to impart high quality education and holistic development of students like, (i) Computer education for all ; (ii) Libraries with digital facilities; (iii) Play grounds and sports complex; (iv) High quality science education and well equipped laboratories; (v) Programmes for co-curricular development of students (vi) Satellite based education (vii) Inclusive education for all children (viii) Talent Nurture Programme for rural and tribal children by providing free education up to 12th standard (ix) Utilization of information technology for world class education (x) creation of science parks, adventure parks and botanical gardens in all schools (xi) obtaining ISO certification for Junior College, Mumbai (xiii) Financial support for community education and creation of community radio station.
- ❖ Academic excellence is ensured including participation of students in the various Olympiads.

### **National Institute of Science Education and Research, Bhubaneswar**

- ❖ Established in 2007, on the lines of IISERs, NISER's objective is to conduct five year integrated M.Sc. programme for students after 10+2 higher secondary schooling.
- ❖ The objective of this programme is to integrate these further into Ph.D. programme on the one hand and providing high quality research scientists through various R&D organizations.
- ❖ Conducting five year integrated M.Sc. programmes in the emerging core branches of basic sciences, viz., Physics, Chemistry, Mathematics and Biology.

## **Nuclear and Arms Control Centre**

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- ❖ From 2007, around 267 students admitted for the five year integrated programme and 50 students are carrying out research towards Ph.D programme.
- ❖ Admission to the programmes through common national entrance tests
- ❖ Providing excellent academic facility to the students temporarily in the IoP campus at Bhubaneswar. The new campus is coming up in an area of 300 acres, at Jatni near Bhubaneswar .

([http://www.dae.nic.in/writereaddata/1837\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1837_lsus100811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1838**  
TO BE ANSWERED ON 10.08.2011

### SAFETY OF NUCLEAR POWER PLANTS

1838. SHRI M.B. RAJESH:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Union Government has examined the international response to the Fukushima Nuclear Disaster and the steps taken by various countries in the context of the accident;
- (b) if so, the details thereof;
- (c) whether the Government proposes to hold in abeyance the practice of uprating and extending the life term of nuclear reactors;
- (d) if not, the reasons therefor; and
- (e) whether the Government proposes to consider imposing a moratorium on further nuclear activity in the wake of increasing concerns over nuclear safety?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) Countries across the globe, with nuclear power reactors, have reviewed the safety of their reactors in context of the Fukushima through mechanisms like 'stress tests' etc. They have also come out with the recommendations to further enhance the safety in the nuclear power reactors. India has also undertaken the safety evaluation through the task forces constituted for each of the technology in operation and reactors under construction. These reviews have found that Indian nuclear power reactors have sufficient margins in design features to withstand the extreme natural events. These task forces have also made certain recommendations to enhance the safety further which are being implemented after due process of approvals. Barring Germany and Switzerland, no other country with nuclear power programmes have made any announcements on phasing out nuclear power plants.
- (c) No, Sir.
- (d) Nuclear power reactor designs are robust and have inherent margins in the designs of the reactors appreciably beyond their design life. The health assessment of the components, equipment and systems in nuclear power plants are carried out periodically and necessary upgrades are implemented time to time to ensure that safety standards are always at state of the art level. In addition, regular inspections and reviews of the safety of Indian nuclear power plants are also carried out by Atomic Energy Regulatory Board (AERB) independently. The ageing management procedures and technology are well developed and are in place at the nuclear power plants. A thorough review of the structures, systems

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and equipment are carried out by the utility and decision on the extension of life is finally taken after concurrence of the regulator, the Atomic Energy Regulatory Board.

(e) No, Sir.

([http://www.dae.nic.in/writereaddata/1838\\_lsus100811.pdf](http://www.dae.nic.in/writereaddata/1838_lsus100811.pdf))

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 1795**  
TO BE ANSWERED ON 10.08.2011

### SETTING UP OF ATOMIC POWER PLANTS

1795. SHRI BHARAT RAM MEGHWAL:

SHRI MADHU KODA:

KUMARI MEENAKSHI NATARAJAN:

DR. BHOLA SINGH:

SHRIMATI J. SHANTHA:

SHRI KHILADI LAL BAIRWA:

SHRI BRIJBHUSHAN SHARAN SINGH:

SHRI VISHWA MOHAN KUMAR:

SHRI KUNWAR REWATI RAMAN SINGH:

SHRI ANANTH KUMAR:

SHRI HARISHCHANDRA CHAVAN:

SHRI JAI PRAKASH AGARWAL:

DR. KRUPARANI KILLI:

SHRIMATI DEEPA DASMUNSI:

SHRI BHUDEO CHOUDHARY:

SHRI MANIKRAO H. GAVIT:

SHRI RAVNEET SINGH:

DR. KIRODI LAL MEENA:

SHRI D.B. CHANDRE GOWDA:

Will the PRIME MINISTER be pleased to state:

- (a) the details of nuclear power plants in the country with installed capacity and funds spent in installation of these plants, State-wise and Plant-wise;
- (b) whether the target fixed for nuclear power generation during the Eleventh Five Year plan has been achieved by the Government;
- (c) if so, the details thereof and if not, the reasons therefor alongwith the steps taken/proposed to be taken by the Government to increase the nuclear power generation in the country;
- (d) whether some of the State Governments have requested to set up nuclear power plants in their State;
- (e) if so, the details thereof, State-wise;
- (f) whether the Government proposes to open new nuclear power plants in the country;
- (g) if so, the details thereof, location-wise alongwith and estimated cost and capacity of these plants and names of companies helping in installation and other works of these plants; and
- (h) the steps taken/proposed to be taken by the Government for timely completion of the said plants?

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### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) There are 20 nuclear power reactors in operation with a total capacity of 4780 MW at six sites. The details are as under

State	Location	Unit	Capacity (MW)	Completion Cost in ` crore
<b>Western Region</b>				
Gujarat	Kakrapar	KAPS 1&2	2 X 220	1366.68
Maharashtra	Tarapur	TAPS-1&2	2 X 160	92.99
		TAPS-3&4	2 X 540	6525
<b>Northern Region</b>				
Rajasthan	Rawatbhata	RAPS 1&2	100 + 200	175.81
		RAPS 3&4	2 X 220	2511
		RAPS 5&6	2 X 220	2362*
Uttar Pradesh	Narora	NAPS 1&2	2 X 220	723.62
<b>Southern Region</b>				
Karnataka	Kaiga	Kaiga 1&2	2 X 220	2896
		Kaiga 3&4	2 X 220	2877*
Tamilnadu	Kalpakkam	MAPS 1&2	2 X 220	245.87

- (b)&(c) The target of nuclear power generation as per Mid-Term Appraisal (MTA) of XI Plan was 1,24,608 Million Units (MUs). The achievement till July 2011 has been 87862 MUs. The nuclear power generation in XI Plan is expected to be about 1,09,000 MUs. The shortfall has been on account of shortage of domestic fuel and delay in accessing imported fuel due to developments on international cooperation in the first three years of the plan period. Efforts put in by the government have now resulted in access to imported fuel for reactors under safeguards, improvement in supply of domestic fuel and in substantial improvement in the generation of nuclear power in the fourth year of the plan period (26000 MUs in 2010-11).

- (e) In the recent past, sites have been offered by the following states:

- (d) Yes, Sir.

State	Place
Andhra Pradesh	Pulivendla
	Nizampatnam
Bihar	Rajauli
Haryana	Balsamand
	Kitlana
Karnataka	Mannur

The evaluation of these sites by the Standing Site Selection Committee of the Government is at various stages.

- (f) Yes, Sir.

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(g) Currently, seven nuclear power reactors with a capacity of 5300 MW are under construction. The details of the plants under construction are given below:

Project	Location	Capacity (MW) & Type	Approved Cost ` crore	Expected Completion
KK -1&2	Kudankulam, Tamilnadu	2X1000 Vodo-Vodyanoi-Energetichesky Reactors(VVERs)	13171*	2011-12
PFBR	Kalpakkam, Tamilnadu	500 Prototype Fast Breeder Reactor (PFBR)	3492*	2012-13
KAPP 3&4	Kakrapar, Gujarat	2X700 Pressurised Heavy Water Reactors (PHWRs)	11459	2015-16
RAPP 7&8	Rawatbhata, Rajasthan	2X700 Pressurised Heavy Water Reactors (PHWRs)	12320	2016-17

### UNDER REVISION

GOVERNMENT HAS ALSO ACCORDED 'IN PRINCIPLE' APPROVAL FOR FIVE NEW SITES AND UTILISATION OF THE FULL POTENTIAL OF KUDANKULAM AND JAITAPUR SITES IN OCTOBER

2009. THE DETAILS OF THESE SITES ARE GIVEN BELOW:

Location & State	In technical cooperation with Company & Country	Capacity (MW) in first phase	Total Capacity (MW)
Gorakhpur, Haryana	Indigenous	2 X 700	4 X 700
Chutka, Madhya Pradesh	Nuclear Power Corporation of India Limited, India	2 X 700	2 X 700
Kudankulam, Tamilnadu	Atomstryexport (ASE), Russian Federation	2 X 1000	6 X 1000
Haripur, West Bengal		2 X 1000	6 X 1000
Jaitapur, Maharashtra	Areva, France	2 X 1650	6 X 1650
Kovvada, Andhra Pradesh	GE Hitach Nuclear Energy (GEH), USA	2 X 1000*	6 X 1000*
Chhaya Mithi Virdi, Gujarat	Westinghouse Electric Company (WEC), USA	2 X 1000*	6 X 1000*

\* Nominal Capacity

## Nuclear and Arms Control Centre

Currently, pre-project activities including preparation of Detailed Project proposals are in progress. Discussions are in progress with the technology vendor companies in respect of reactors to be set up with foreign technical cooperation. The costs of the projects will be known after finalization of the project proposals.

**THE GOVERNMENT HAS ALSO APPROVED SETTING UP TWO 500 MW FAST BREEDER REACTORS (FBRS 1&2) AT KALPAKKAM, TAMILNADU. THESE INDIGENOUS FBRS WILL BE SET UP BY BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED (BHAVINI).**

**RECENTLY, THE GOVERNMENT HAS ACCORDED 'IN PRINCIPLE' APPROVAL FOR FOUR MORE SITES FOR INDIGENOUS PHWRS, TO BE SET UP BY NPCIL:**

Location & State	Capacity (MW)	Remarks
Mahi Banswara, Rajasthan	4 X 700	New site, Planned in two phases of 2X700 MW
Bhimpur, Madhya Pradesh	4 X 700	New site, Planned in two phases of 2X700 MW
Kaiga, Karnataka *	2 X 700	Existing site. 4X220 MW are in operation
Narora, Uttar Pradesh *	2 X 700	Existing site. 2X220 MW are in operation

\*Expansion at existing sites

(h) All the requirements of embarking on large nuclear power programme and completing the projects on time are being addressed. In respect of indigenous projects, the capability and capacity of Indian industry to supply equipment and components generally exist. It is being augmented by formation of Joint Ventures. A Joint Venture for turbogenerators of 700 MW is proposed to be set up between NPCIL, Bharat Heavy Electricals Limited (BHEL) and M/s. Alstom, France. A Joint Venture between NPCIL and M/s Larsen Toubro Limited (L&T) has been incorporated to manufacture special steels and forgings required for manufacture of nuclear components. The human resources are also being developed for the programme in a planned manner.

([HTTP://WWW.DAE.NIC.IN/WRITEREADDATA/1795\\_LSUS100811.PDF](http://www.dae.nic.in/writereaddata/1795_LSUS100811.PDF))



## **Nuclear and Arms Control Centre**

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**Ministry of External Affairs  
LOK SABHA  
UNSTARRED QUESTION NO.1772  
TO BE ANSWERED ON 10.08.2011**

**SHRI JAGDAMBIKA PAL:**

### **NUCLEAR SUPPLIERS GROUP**

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether China has recently obtained the approval of the Nuclear Suppliers' Group (NSG) to supply nuclear reactors to Pakistan;
- (b) if so, the details thereof alongwith the names of the member countries which supported China;
- (c) whether the Government has made any assessment of its impact on the strategic situation in the region;
- (d) if so, the details thereof;
- (e) whether the Government had raised its concerns over the deal with the members of the NSG; and
- (f) if so, the details thereof?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SMT. PRENEET KAUR)

(a) to (f) There have been reports about China's supply of two nuclear reactors to Pakistan. Details of NSG discussions on this issue are not publicly available. Government keeps a constant watch on all developments having a bearing on India's national interest and takes all necessary measures to safeguard it.

(<http://meaindia.nic.in/mystart.php?id=100518086>)

### **SUO MOTU STATEMENT IN LOK SABHA BY EAM ON NUCLEAR ENRICHMENT AND REPROCESSING TECHNOLOGY**

August 10, 2011

Madam Speaker,

I rise to inform the House of the issue of nuclear Enrichment and Reprocessing Technology.

2. Several Members have raised the issue of the adoption of new guidelines by the Nuclear

## Nuclear and Arms Control Centre

Suppliers Group at its Plenary meeting in the Netherlands from June 23-24, 2011 relating to transfer of enrichment and reprocessing technologies.

3. Concerns have been expressed about its implications on our existing agreements with other countries on civil nuclear cooperation, whether the revised guidelines are targeted at India and where do they leave us with regard to the scope of our civil nuclear cooperation with the rest of the world.

Madam Speaker,

4. In this context, I wish to make the following clarifications :-

i) We are absolutely clear that as far as India is concerned, the basis of our international civil nuclear cooperation remains as contained in the special exemption from the NSG guidelines given to India on September 6, 2008. The “Statement on Civil Nuclear Cooperation with India” issued on September 6, 2008 after an Extraordinary Plenary Meeting of the NSG spells out the scope of our cooperation. That statement contains reciprocal commitments and actions by both sides relating to international civil nuclear cooperation.

ii) The September 2008 exemption accords a special status to India. It was granted knowing full well that India is not a signatory to the Nuclear Non-Proliferation Treaty. Honourable Members would recall that on August 17, 2006, Prime Minister had indicated that one of our main objectives of the Civil Nuclear Initiative was the removal of restrictions on all aspects of cooperation and technology transfers pertaining to civil nuclear energy, covering all aspects of the complete nuclear fuel cycle. We see this as the surest guarantee of India’s acceptance as a full and equal partner of the international nuclear community. As PM had informed this august House on July 29, 2009, we were successful in securing a “clean” exemption from the NSG in September 2008 i.e. the NSG members had agreed to transfer all technologies which are consistent with their national law.

iii) As far as we are concerned, the September 2008 decision is the basis and overarching framework that governs cooperation in civil nuclear matters between India and the NSG. The issue is the full implementation of that understanding. This is what we expect and our major partners are committed to.

iv) We must take note of the fact that the NSG Public Statement of June 24, 2011 makes a specific reference to cooperation with India. It says that the NSG “continued to consider all aspects of the implementation of the 2008 Statement on Civil Nuclear Cooperation with India and discussed the NSG relationship with India”.

v) The agreements reached for permitting international civil nuclear cooperation with India contain commitments on both sides. We expect all NSG members to honour their commitments as reflected in the 2008 NSG Statement and our bilateral cooperation agreements.

vi) The Guidelines of June 23-24, 2011 are a decision by the NSG. India is not a member of the NSG as yet and therefore not a party to this decision.

Madam Speaker,

## **Nuclear and Arms Control Centre**

5. Following the NSG Plenary of June 2011, several of our partners have clarified their positions:

i) The US Department of State in a Press Statement has stated that the “Obama Administration fully supports the ‘clean’ Nuclear Suppliers Group exception for India and speedy implementation of the US-India Civil Nuclear Cooperation Agreement. Nothing about the new Enrichment and Reprocessing (ENR) transfer restrictions agreed to by the NSG members should be construed as detracting from the unique impact and importance of the US-India Agreement or our commitment to full civil nuclear cooperation”. The Press Statement further states that the “NSG’s NPT references, including those in the ENR guidelines, in no way detract from the exception granted to India by NSG members in 2008”.

ii) A Communique issued by the Ambassador of France in New Delhi on July 5, 2011 has stated that the NSG exemption “reflects the unique situation of India and constitutes a historical achievement. Therefore, in the French view, nothing in the existing and future guidelines shall be interpreted as detracting from that exemption or reducing the ambition of our bilateral cooperation”.

iii) The Russian Foreign Ministry spokesman on July 14, 2011 stated that the NSG decision “does not affect in any way the September 2008 decision of the Group to unfreeze peaceful nuclear cooperation with India”.

6. In so far as enrichment and reprocessing technology is concerned, I would like to reiterate to Honourable Members that India has full mastery of the entire nuclear fuel cycle, and this includes enrichment and reprocessing technology. We have a well-developed indigenous enrichment and reprocessing infrastructure. Government is committed to taking forward our domestic three-stage nuclear power programme. India is among the handful of countries that has developed fast breeder technology. Access to enrichment and reprocessing technology from abroad, as part of international civil nuclear cooperation, is only an additionality to accelerate our three-stage programme.

7. The transfer of enrichment and reprocessing items and technology has no bearing whatsoever on India’s upfront entitlement to reprocess foreign origin spent fuel and the use of such fuel in our own safeguarded facilities.

8. Not every NSG member has the ability to undertake transfer of enrichment and reprocessing items and technology to other countries. We expect that those that do and have committed to do so in bilateral agreements with India, will live up to their legal commitments.

9. I would also like reassure Honourable Members that we will not accept pre-conditions for transfer of enrichment and reprocessing items and technology. There is no question of India joining the Nuclear Non-Proliferation Treaty as a non-nuclear weapon State.

10. India is engaged with the four multilateral export control regimes, namely the NSG, the Missile Technology Control Regime, the Australia Group and the Wassenaar Arrangement for full membership. We have noted with appreciation the expressions of support from a number of our partners towards this objective.

Madam Speaker,

## **Nuclear and Arms Control Centre**

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11. I am confident that the international nuclear order will continue to evolve in India's favour. We are poised to emerge as one of the major nuclear countries in the world, with a large and diversified nuclear industry. India is committed to full international civil nuclear cooperation for the development needs of our country and is engaged in discussions with foreign companies to expand our nuclear energy programme. We expect that our international partners will fully honour their commitments in this regard.

Thank you.

New Delhi  
August 10, 2011

(<http://meaindia.nic.in/mystart.php?id=100517969>)

## **Nuclear and Arms Control Centre**

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**Ministry of External Affairs  
RAJYA SABHA  
UNSTARRED QUESTION NO.532  
TO BE ANSWERED ON 04.08.2011  
SHRI H.K. DUA:**

### **ACQUISITION OF NUCLEAR WEAPON BY PAKISTAN**

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the Government is aware of the reports that Pakistan has stepped up stockpiling its nuclear weapons aiming at acquiring about 200 warheads in the coming decade;
- (b) whether Pakistan is building two plutonium production reactors and new reprocessing facility to fabricate more nuclear weapon fuel; and
- (c) whether Pakistan's enhanced nuclear weapons programme would be a threat to India's security?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SHRI E. AHAMED)

(a) to (c) Government has seen reports regarding Pakistan's expansion of its nuclear stockpile. However, Government does not comment on the veracity of specific reports about nuclear weapons. Government continuously monitors all developments having a bearing on national security and takes all necessary steps to safeguard it.

(<http://meaindia.nic.in/mystart.php?id=100517962>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.466**  
TO BE ANSWERED ON 04.08.2011

### BRINGING STRICT RADIATION EMISSION GUIDELINES

466 SHRIMATI T. RATNABAI

Will the PRIME MINISTER be pleased to state:

- (a) whether Government is bringing out stricter radiation emission guidelines;
- (b) if so, the details thereof; and ;
- (c) the objectives thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) No Sir. The limits on radiation emissions from the nuclear facilities to the environment are based on the radiation dose limit to the public (1000  $\mu$ Sv/y), set by the Atomic Energy Regulatory Board (AERB) which is in line with the guidelines of the International Commission on Radiological Protection (ICRP). The actual radiation dose to the public due to emissions to the environment from nuclear installations is only a fraction (1-3%) of the limit set by AERB.

The existing guidelines are considered adequate and the Government is not planning to bring out any new radiation emission guidelines.

- (b) does not arise.
- (c) does not arise.

([http://www.dae.nic.in/writereaddata/rsus466\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus466_040811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.467**  
TO BE ANSWERED ON 04.08.2011

### REVIEW OF NUCLEAR POWER POLICY

467 SHRI M.P. ACHUTHAN  
SHRI D. RAJA  
SHRI RAJKUMAR DHOOT

Will the PRIME MINISTER be pleased to state:

- (a) whether Government's attention has been drawn to the decision of Germany to shut down its nuclear plants latest by 2022 in response to the rising public opinion after the Fukushima disaster;
- (b) if so, the details thereof; and ;
- (c) whether Government has any proposal to review its nuclear power policy following Fukushima disaster; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) There had been an ongoing political debate in Germany on closing down nuclear power, even before the Fukushima incident in Japan. The recent decision of the Germany to shut down all its nuclear power plants by 2022 has to be seen in that context. Of the 17 reactors in operation in that country, 8 reactors mostly commissioned before 1980 have been shut down and the remaining are to be shut down in a phased manner by 2022. In 2010, nuclear power contributed about 133 Billion units of electricity in Germany. Given its location, low growth in demand and import possibilities, it has other energy options. Germany is making up the loss from nuclear power generation from units shut down by electricity imports, including that of nuclear power from France and Czech Republic. It plans to increase generation from other sources including coal and gas while keeping its Green House Gas (GHG) emission targets to make up the loss from shut down of nuclear power by 2022.
- (c)&(d) India's energy resources are limited and its demand is huge and rapidly growing. In the Indian scenario, all sources of electricity generation need to be deployed optimally. Given India's energy resource profile, nuclear power is an important clean energy option for long term energy security and sustainability. It will be pursued, with enhanced emphasis on safety.

([http://www.dae.nic.in/writereaddata/rsus467\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus467_040811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 468**  
TO BE ANSWERED ON 04/08/2011

### HEALTH RISK AROUND NARORA POWER STATION

468 SHRI SHIVANAND TIWARI

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that Narora Power Station is surrounded by one of the densest concentration of population across the world;
- (b) whether Government has assessed the health of the persons living around Narora Power Station;
- (c) if so, whether any adverse effect has been established on the health of persons living there; and
- (d) if so, remedial action that has been taken therefor?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) The Site Selection Committee of Government has recommended the Narora site after a detailed evaluation of the site in accordance with the siting criteria laid down in the prevailing regulatory siting code. As per the 2001 census estimates, the density of population around 10 km radius around Narora was 515 persons per sq. km. which is lower than that of the state of Uttar Pradesh (550 persons per sq. km) and the Bulandshahr district where the plant is located (786 persons per sq. km.). Thus, the Narora Atomic Power Station is not located in one of the densest concentration of population.
- (b) An epidemiological survey and collection of data of health of the employees and their families, who stay in the nearby township and villages, was carried out by Jawaharlal Nehru Medical College, Aligarh Muslim University and analysis carried out by Tata Memorial Hospital, Mumbai the premier cancer research centre of the country. In addition, annual medical examinations of all workers are carried out regularly.
- (c)&(d) No, Sir. The studies have indicated that the morbidity pattern of all ailments is lower than the national average of the corresponding ailments. There has also not been any rise in cancer morbidity compared to national average.

([http://www.dae.nic.in/writereaddata/rsus468\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus468_040811.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.469**  
TO BE ANSWERED ON 04.08.2011

### IMPORT OF NEW TYPE OF NUCLEAR REACTORS

469. SHRI RAMDAS AGARWAL

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that former Chairman of Atomic Energy Regulatory Board has raised alarm over Government's nuclear power programme, based on new type of imported reactors, saying that it would turn India's entire coastline into a disaster zone in waiting;
- (b) if so, details thereof; and;
- (c) the preventive measures Government proposes to take to protect country's total coastline of about 6000 km where about 109 6-reactor nuclear parks spaced along the coast of every 55 km apart are proposed to be installed?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) In a statement in a newspaper in April 2011, a former Chairman of AERB, has raised the issue of the large nuclear power capacity projection of the Indian Nuclear Power Programme in the long term from Light Water Reactors (LWRs) to be set up with international cooperation followed by setting up of Fast Breeder Reactors.
- (c) At present Government has announced setting up of five nuclear energy parks each having a potential of producing 10000 MWe. Location of these parks viz. Kudankulam in Tamilnadu, Kovvada in Andhra Pradesh and Haripur in West Bengal on the east coast and Jaitapur in Maharashtra and Chhaya Mithi Virdi in Gujarat on the west coast are far apart. The reactors which are being considered to be built in technical cooperation with other countries are of evolutionary design based on extensive experience of operation. These reactors employ latest state of the art safety features.

Environmental impacts of nuclear power stations are being continuously monitored. For plants located at coastal sites, viz. Kalpakkam in Tamilnadu and Tarapur in Maharashtra, thermal ecology and biodiversity of the marine environment are also monitored. There has been no evidence of any adverse effect on the environment of these coastal locations due to the operation of nuclear power plants.

([http://www.dae.nic.in/writereaddata/rsus469\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus469_040811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.471**  
TO BE ANSWERED ON 04.08.2011

### INDIAN MEMBERSHIP IN IAEA

471. SHRI MOHAN SINGH

Will the PRIME MINISTER be pleased to state:

- (a) whether India is in the process of being included in the member countries of International Atomic Energy Agency, whether India has the support of America in this campaign;
- (b) whether India has begun to implement the plan of strengthening its atomic energy plants a new ; and
- (c) the steps being taken in above said direction considering the security of atomic energy plants crucial in India after the experiences of earthquake in Japan?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) India has been a member of the International Atomic Energy Agency (IAEA), a UN organization set up to promote peaceful uses of atomic energy, since its inception in 1957.
- (b)&(c) Yes, Sir. The Indian nuclear power programme accords highest priority to safety in all facets of nuclear power. Safety is a moving target and review of safety and security and effecting necessary upgrades thereof, in line with evolving safety standards and feedback from events in nuclear power plants, in-house and around the world is an ongoing process. Safety evaluation of Indian nuclear power plants by the task forces constituted in the Department in the context of Fukushima incident in Japan has found that Indian nuclear power reactors are safe against extreme natural events. Recommendations of the task forces to further enhance safety are being implemented after due process of approval. These have been worked out and are in the various stages of implementation.

([http://www.dae.nic.in/writereaddata/rsus471\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus471_040811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 472**  
TO BE ANSWERED ON 04/08/2011

### ACCIDENTS IN NUCLEAR POWER PROJECTS

472 SHRI K.N. BALAGOPAL

Will the PRIME MINISTER be pleased to state:

- (a) whether Government is aware of the aggravating incidents of failures and accidents in Nuclear Power projects;
- (b) if so, whether any serious evaluation of study has been conducted about Indian Nuclear Projects;
- (c) the details thereof; and
- (d) whether Government would reconsider about India's Nuclear Road Map and reduce our dependence on nuclear energy considering the alarming situation, especially after Japan's Nuclear accident?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) Safety is accorded utmost importance in all stages of nuclear power from siting, design, construction, operation to decommissioning. The safety track record of over 340 reactor-years of operation by Indian nuclear power reactors has been good. The safety evaluation and audits are regularly carried out independently by Atomic Energy regulatory Board (AERB). The periodic review have found that there have been no aggravation of incidents of failures or accidents in Indian nuclear power plants.
- (b)&(c) Safety is a moving target and regular reviews of incidents at national & international levels and incorporation of lessons learnt from these, as appropriate, are inbuilt in safety culture at Indian nuclear power plants. In line with this, an evaluation of safety of Indian nuclear power plants has been carried out by Nuclear Power Corporation of India Limited in the context of Fukushima incident in Japan. The safety evaluation has found that Indian nuclear power reactors are safe against extreme natural events. They have also made recommendations to further enhance safety measures which are being implemented after due process of approval. The reports of this evaluation and earlier recommendations and implementation status of these in respect of Chernobyl and Three-mile island etc. have also been put in the public domain. Committees have also been constituted by the Atomic Energy Regulatory Board (AERB) and Bhabha Atomic Research Centre (BARC) which are evaluating the safety of nuclear power reactors. Their recommendations and that of other International studies will also be appropriately implemented.

## **Nuclear and Arms Control Centre**

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- (d) India is not rich in energy resources and no single source can meet the growing energy/electricity requirements of the country. Therefore all energy options need to be deployed, including nuclear resource. Nuclear power is an important carbon emission free clean energy option for meeting India's future demand and will be pursued, with enhanced emphasis on safety.

([http://www.dae.nic.in/writereaddata/rsus472\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus472_040811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 473**  
TO BE ANSWERED ON 04/08/2011

### BUILDING NUCLEAR REACTOR BY BHEL

473 SHRI RAMCHANDRA PRASAD SINGH  
SHRI RAM JETHMALANI

Will the PRIME MINISTER be pleased to state:

- (a) Whether it is a fact that a public sector heavy industries company Bharat Heavy Electricals Ltd. has acquired the competence to build nuclear reactors with indigenous resources;
- (b) if so, the details thereof;
- (c) whether indigenously built reactors are inferior to foreign built reactors; and
- (d) if so, the details thereof and the annual reactor building capacity currently available in the country?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) Bharat Heavy Electricals Limited (BHEL) has the competence for manufacture and supply major components like turbo generators, steam generators, pumps, switch gears etc. required for nuclear power plants. They do not have the capacity for building a full nuclear power plant.
- (c) India has mastered the complete technology of building and operating Pressurised Heavy Water Reactors (PHWRs). 18 such reactors (220 MWe and 540 MWe in capacity) are currently under operation and 4 more PHWRs of 700 MWe capacity are under construction. These reactors are in no way inferior to PHWRs built elsewhere. The Indigenously built nuclear power reactors employ the latest State of Art safety features and systems. The safety, operational and economic performance of indigenous nuclear power reactors has been excellent and demonstrated at par with international bench marks.
- (d) Indian Industry is currently having a capacity to build two 700 MWe reactors annually.

([http://www.dae.nic.in/writereaddata/rsus473\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus473_040811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.474**  
TO BE ANSWERED ON 04.08.2011

### DEPOSITS OF THORIUM IN COUNTRY

474 SHRI RAVI SHANKAR PRASAD  
SHRI RAM JETHMALANI

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that rich deposits of thorium have been found in the country;
- (b) if so, the total quantity of thorium presently available in the country and the power generation capacity that the processing of it could yield; and
- (c) whether the technology required for generating power using thorium has been developed in the country and if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a) Yes, Sir.

(b) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy has established 10.70 million tonnes of Monazite in the country, which contains 9,63,000 tonnes of Thorium Oxide (ThO<sub>2</sub>). Indian Monazite contains about 9-10% of ThO<sub>2</sub> and about 8,46,477 tonnes of Thorium Metal can be obtained from 9,63,000 tonnes of ThO<sub>2</sub> which will be used for future programmes of DAE.

India is pursuing a three stage nuclear power generation programme aimed at long term energy independence based on use of our abundant Thorium resources. The programme is to use Thorium for electricity generation in the long-term. In order to realize this goal, we are well into the first stage based on our modest domestic Uranium resources. This will be followed by second stage comprising of fast reactors which can support a large power generation capacity before getting into the third stage.

Thorium being a fertile material cannot produce fission energy unless it is converted to Uranium-233. Most effective conversion of thorium to Uranium-233 can be done in fast reactors several of which will be set up in the second stage of Indian nuclear programme. A comprehensive three-stage nuclear power programme is therefore being implemented sequentially.

(c) Yes, Sir. India has been working on the development of technologies for Utilisation of Thorium for Nuclear Power Generation since the inception of the Indian Nuclear Programme. As a part of this work, thorium has been irradiated in our Research Reactors and also in Pressurised Heavy Water Reactors. Technologies for reprocessing of irradiated thorium fuel for the separation of Uranium-233 have also been developed on a pilot plant scale. Uranium-233 thus separated has been used as fuel in research reactor Purnima-II and later in the 30 kw Research Reactor Kamini now in operation at Indira Gandhi Centre for Atomic Research(IGCAR), a constituent Unit of the Department of

## **Nuclear and Arms Control Centre**

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Atomic Energy (DAE). Experimental thorium based fuel has been manufactured and used in the critical facility for Reactor Physics experiments as well. Further development of technologies for large scale commercial level manufacture and reprocessing of Uranium-233 bearing fuel is underway. The Indian AHWR is the only large scale reactor that has been designed and developed to produce a large fraction, nearly 2/3 rd of its power from the fission of Uranium-233 in the equilibrium state of this reactor core.

([http://www.dae.nic.in/writereaddata/rsus474\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus474_040811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 476**  
TO BE ANSWERED ON 04/08/2011

### DENSE POPULATION AROUND NARORA ATOMIC POWER PLANT

476 SHRI SHIVANAND TIWARI  
SHRI RAJKUMAR DHOOT

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that a study has found Narora Atomic Power Plant in high risk category due to dense population around the plant;
- (b) if so, the details thereof; and
- (c) the action Government proposes to take as preventive action plan in view of the findings of the study?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a)to(c) The selection of a nuclear power plant site is a long drawn process, with evaluation carried out in accordance with the siting criteria as laid down in the prevailing siting code and extensive consultation process thereafter. The Site Selection Committee of Government had recommended the Narora site after a detailed evaluation of the site including that of population. The approval of the site was also accorded after due consideration of all relevant factors related to population, like emergency planning etc. The design of the plant has taken into consideration all relevant factors and features/ systems have been engineered to ensure that there is no release of radioactivity in the public domain under all conditions of operation. There has been a natural increase in population around the plant, which has been factored into the emergency preparedness plans from time to time. Periodic emergency preparedness exercises carried out at the site to validate and improve upon these plans based on feedback.

([http://www.dae.nic.in/writereaddata/rsus476\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus476_040811.pdf))



## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.477**  
TO BE ANSWERED ON 04.08.2011

### **FULFILLMENT OF NUCLEAR COMMITMENTS**

477 DR. T. SUBBARAMI REDDY:

Will the PRIME MINISTER be pleased to state:

- (a) Whether India expects partners to fulfill nuclear commitments;
- (b) if so, the details thereof; and ;
- (c) the response received so far?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) to (c) Agreements between India and various other countries on peaceful uses of nuclear energy are to be implemented as per the agreed terms. Pursuant to the agreements for cooperation in peaceful uses of nuclear energy with France, Russia and USA, commercial negotiations for setting up of nuclear power plants in India in cooperation with entities in Russia, France and USA are continuing.

([http://www.dae.nic.in/writereaddata/rsus477\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus477_040811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 478**  
TO BE ANSWERED ON 04/08/2011

### SAFETY ASSESSMENT OF NUCLEAR PLANTS

478 PROF. ANIL KUMAR SAHANI

Will the PRIME MINISTER be pleased to state:

- (a) whether Nuclear Power Corporation of India Limited (NPCIL) has submitted its report concerning safety assessment of nuclear plants to Nuclear Energy Department;
- (b) whether Government has gone through the report and if so, their reaction and the action taken on the recommendations of the report; and
- (c) the safety measures taken by Government to protect nuclear plants from natural disasters?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) Yes, Sir. Soon after the incident at Fukushima in Japan, NPCIL constituted four task forces, one each for assessment of technology of reactors in operation and to review their safety in the context of the Fukushima incident. Subsequently two more task forces were constituted to review the safety of reactors under construction. These taskforces have submitted their reports. The reports have been submitted to the government and also put in public domain.
- (b) The Government has considered the report and directed that the recommendations of the taskforces and those of the high level committee constituted by the Atomic Energy Regulatory Board (AERB) and the Bhabha Atomic Research Centre (BARC) be implemented after due process of approval. The reports of AERB and BARC are awaited.
- (c) While the review by the task forces have found that Indian nuclear power plants are safe against extreme natural events, measures like provisions for automatic shutdown on sensing seismic activity, augmenting cooling water inventories, provision of portable power sources, shore protection measures against tsunami at coastal sites etc. have been recommended to further enhance safety which are being implemented.

([http://www.dae.nic.in/writereaddata/rsus478\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus478_040811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 527**  
TO BE ANSWERED ON 04/08/2011

### AGITATION AGAINST JAITAPUR NUCLEAR POWER PLANT

527 : SHRI RANJITSINH VIJAYSINH MOHITE PATIL :

Will the PRIME MINISTER be pleased to state:

- (a) whether Government has proposed to install a nuclear power plant in Jaitapur in coastal Ratnagiri District;
- (b) whether there was some agitation by the people of that area against the installation of Jaitapur nuclear power plant;
- (c) whether the agitation became aggressive and one person was killed in the agitation;
- (d) whether the agitation of locals was a result of Environment and Forest Minister's statement for ruling out a re-think on the project; and
- (e) if so, the details of the agitation and circumstances leading to this agitation?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) Yes, Sir. There are plans to set up a pair of Light Water Reactors of 1650 MW each at Jaitapur in Rajapur Taluka, Ratnagiri District, Maharashtra, in technical cooperation with France.
- (b)&(c) A section of people has been opposing setting up of the project and they were holding occasional agitations, one of which resulted in unfortunate loss of life of a person.
- (d)&(e) As the opposition is primarily due to land acquisition issue, efforts are continued to arrive at an acceptable Rehabilitation and Resettlement package in consultation with the State Government. Their apprehensions and misconceptions on issues ranging from safety of reactors, radioactive waste management, rehabilitation, livelihood, bio-diversity, etc. are being addressed through sustained public awareness campaigns.

([http://www.dae.nic.in/writereaddata/rsus527\\_040811.pdf](http://www.dae.nic.in/writereaddata/rsus527_040811.pdf))

## Nuclear and Arms Control Centre

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Ministry of External Affairs  
RAJYA SABHA  
UNSTARRED QUESTION NO.531  
TO BE ANSWERED ON 04.08.2011

SHRI H.K. DUA:

### GUIDELINES ON EXPORT OF NUCLEAR TECHNOLOGIES

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the Nuclear Suppliers Group has taken a decision in its meeting on June, 24 at Vienna to change the guidelines on the export of enrichment and reprocessing technologies;
- (b) whether the NSG's decision practically amount to undoing of the clear waiver it gave for the export of enrichment and reprocessing technologies to India; and
- (c) whether it creates uncertainty about the supplies of enrichment and reprocessing technologies from the US, France and Russia under the bilateral agreements for civil nuclear cooperation?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SHRI E. AHAMED)

(a) to (c) Nuclear Suppliers Group (NSG) agreed on new guidelines on the transfer of enrichment and reprocessing (ENR) technologies during its plenary in the Netherlands on 23-24 June 2011. As per new guidelines, suppliers should not authorise the transfer of enrichment and reprocessing facilities, and equipment and technology therefor, if the recipient does not meet various criteria, inter alia being a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). India has raised this issue with NSG and its member countries. United States, France and Russia have clarified, in separate statements their positions on the NSG decision and have reiterated commitment to the full implementation of the respective bilateral agreements with India on cooperation in the peaceful uses of nuclear energy.

(<http://meaindia.nic.in/mystart.php?id=100517961>)

## Nuclear and Arms Control Centre

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Ministry of External Affairs  
RAJYA SABHA  
UNSTARRED QUESTION NO.526  
TO BE ANSWERED ON 04.08.2011

SHRI TAPAN KUMAR SEN:

### PHASING OUT OF NUCLEAR POWER AFTER FUKUSHIMA DISASTER

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether Germany and Switzerland have decided to phase out nuclear power after the Fukushima nuclear disaster;
- (b) whether US, Japan and China are reviewing their nuclear power addition programme;
- (c) if not, their plans for nuclear power addition in next ten years;
- (d) whether India is reviewing its Nuclear Power addition programme in view of the above; and
- (e) if not, the reasons therefor?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SHRI E. AHAMED)

(a) to (c) In the light of Fukushima nuclear incident, some countries are reviewing their nuclear power programmes. Reports indicate that the Governments of Germany and Switzerland plan to phase out nuclear power by 2022 and 2034, respectively. The US stated on 20 June 2011 that it continues to support nuclear energy's role as part of a diversified, low-carbon energy portfolio, and as a way to reduce global air pollution and promote energy security. On 24 March 2011, China stated its intention to develop nuclear projects in an orderly and constructive way. China plans to increase nuclear power production from 10.8 GW to 80 GW by 2020 and 200 GW by 2030.

(d) & (e) In view of India's vast and growing energy needs, nuclear energy is an important clean energy option and this will be pursued with full regard to safety aspects of nuclear power plants. The Government is taking all necessary measures to ensure the safety of our plants.

(<http://meaindia.nic.in/mystart.php?id=100517957>)

## Nuclear and Arms Control Centre

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Ministry of External Affairs  
RAJYA SABHA  
UNSTARRED QUESTION NO.475  
TO BE ANSWERED ON 04.08.2011

SHRI RAMCHANDRA PRASAD SINGH:  
SHRI RAVI SHANKAR PRASAD:

### TRANSFER OF NUCLEAR TECHNOLOGY TO INDIA

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether it is a fact that a group of 46 countries known as Nuclear Suppliers Group (NSG), has banned the transfer of enrichment and reprocessing technology to India;
- (b) if so, the details thereof; and
- (c) the reaction of Government to the ban and whether protest against this ban has been registered with certain countries and if so, the names of the countries?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SHRI E. AHAMED)

(a) to (c) Nuclear Suppliers Group (NSG) agreed on new guidelines on the transfer of enrichment and reprocessing (ENR) technologies during its plenary in the Netherlands on 23-24 June 2011. As per new guidelines, suppliers should not authorise the transfer of enrichment and reprocessing facilities, and equipment and technology therefor, if the recipient does not meet various criteria, inter alia being a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). India has raised this issue with NSG and its member countries. United States, France and Russia have clarified, in separate statements their positions on the NSG decision and have reiterated commitment to the full implementation of the respective bilateral agreements with India on cooperation in the peaceful uses of nuclear energy.

(<http://meaindia.nic.in/mystart.php?id=100517946>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 49**  
TO BE ANSWERED ON 03.08.2011

### SAFETY OF NUCLEAR POWER PLANTS

\*49. SHRI BAIJAYANT JAY PANDA:

DR. BHOLA SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has reviewed the safety measures in atomic power plants of the country in the aftermath of tsunami which struck Japan and radiation from Japanese atomic plants;
- (b) if so, the details and the findings thereof;
- (c) whether the Indian atomic plants are safe against natural disasters including tsunami;
- (d) if so, the details thereof and the other measures taken/proposed to be taken to strengthen and ensure the safety in post Japanese scenario;
- (e) whether it is proposed to set up a Nuclear Regulatory Authority to ensure fool-proof safety mechanism for all existing and upcoming nuclear power plants; and
- (f) if so, the details thereof?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a) to (f) A statement is laid on the Table of the House:

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STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO. 49 FOR ANSWER ON 03.08.2011 BY SHRI BAIJAYANT 'JAY' PANDA AND DR. BHOLA SINGH REGARDING SAFETY OF NUCLEAR POWER PLANTS.

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(a) Yes Sir.

(b) The recent incidents at Fukushima Daiichi in Japan occurred due to extreme natural events, a massive earthquake followed by high intensity tsunami. There are thirteen nuclear power reactors in the affected zone, six reactors at Fukushima Daiichi, four at Fukushima Daini and three at Onagawa. These reactors are located in high seismic zone, close to tsunamigenic region. All the 13 reactors in the affected zone were shutdown on sensing of earthquake and the nuclear fission chain reaction was terminated. The external power supply was lost due to the earthquake. The cooling of fuel was started by on site emergency power supply systems at all the reactors in the affected zone including Fukushima Daiichi. However, at Fukushima Daiichi, the on-site emergency power supply systems were also lost due to the tsunami and the fuel cooling for removing the heat arising out of radioactive decay of fission products in the fuel was affected. This led to overheating of fuel, metal water reaction resulting in hydrogen production and explosion due to hydrogen fire. The progression of events led to release of radioactivity from Fukushima Daiichi. On a directive from Government of India,

## Nuclear and Arms Control Centre

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Nuclear Power Corporation of India Limited (NPCIL) constituted four task forces for each of the technology in operation and two task forces for the two types of reactors under construction. These task forces have revisited the safety of all the nuclear power plants and found that Indian nuclear power reactors have sufficient margins and features in the design to withstand high intensity earthquake and tsunami and thus are safe against extreme natural events. The reports of the task forces have been submitted and made public. The reports are also posted on website of Department of Atomic Energy (DAE) and Nuclear Power Corporation of India Limited (NPCIL). The Atomic Energy Regulatory Board (AERB) and Bhabha Atomic Research Centre (BARC) have also constituted committees whose reports are expected in the near future.

(c) Yes, Sir.

(d) The review of safety has shown that sufficient margins and features exist in designs of Indian nuclear power plants in operation and under construction to withstand extreme natural events including tsunamis, cyclones, storm surges etc. at coastal sites and floods from rain, dam breaks etc. at inland sites. Safety is a moving target and its upgradation is an ongoing exercise. The features, systems and procedures are periodically reviewed in the context of operational feedback and continuously evolving safety standards around the world. In this direction and context of Fukushima events, the task forces have made the following salient recommendations to further enhance the safety in Indian nuclear power plants:

- Automatic reactor shutdown initiation sensing seismic activity.
- Augmentation of cooling water inventories and provisions for additional hook up arrangements through external sources and provision of mobile diesel driven pump sets.
- Increasing the duration of the passive power sources/battery operated devices for monitoring important parameters for a longer duration.
- Additional Shore protections measures at Tarapur Atomic Power Station and Madras Atomic Power Station.
- Revision of Emergency Operating Procedures (EOPs) and structured training programs to train plant personnel on modified EOPs.
- Inerting (filling up of the containment with nitrogen) of the TAPS-1&2 containment

(e)&(f) The safety of nuclear facilities in the country including nuclear power plants is being regulated currently by the Atomic Energy Regulatory Board (AERB), an independent regulatory body, responsible to Atomic Energy Commission (AEC). For creation of a statutory nuclear safety authority which can operate in a transparent and independent manner, the Department is in the process of introducing in parliament “The Nuclear Safety Regulatory Authority Bill, 2011”.

([http://www.dae.nic.in/writereaddata/lssq49\\_030811.pdf](http://www.dae.nic.in/writereaddata/lssq49_030811.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 471**  
TO BE ANSWERED ON 03.08.2011

### PROBLEMS OF INDIAN NUCLEAR INDUSTRY

471. SHRI RAMSINH RATHWA:

Will the PRIME MINISTER be pleased to state:

- (a) whether Indian Nuclear Industry has been struggling with tackling the embargoes;
- (b) if so, the details thereof;
- (c) whether the Government is aware that most of our Research and Development efforts have been spent on import substitution due to lack of infrastructure and resources;
- (d) if so, the details thereof;
- (e) whether Indian reactor technology would take a long time and efforts to come to the international level; and
- (f) if so, the steps being taken by the Government in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)&(b) No, Sir. The Indian nuclear industry is now well matured and does not have to struggle for tackling the embargos for meeting the needs of Indian nuclear power programme, based on Pressurised Heavy Water Reactors (PHWRs).
- (c)&(d) Almost every aspect of nuclear engineering and technology pertaining to nuclear power plants and fuel cycle has already been indigenised. The current research and development efforts are towards development of technologies for advanced reactor systems.
- (e)&(f) No, Sir. Indian nuclear reactor technologies are already on par with the international standards. With the opening of international nuclear commerce, India is considering to build large sized nuclear power plants (1000 MWe or larger light water reactors) in technical collaboration with some foreign vendors mainly to facilitate a faster growth of the nuclear power programme.

([http://www.dae.nic.in/writereaddata/471\\_lsus030811.pdf](http://www.dae.nic.in/writereaddata/471_lsus030811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 539**  
TO BE ANSWERED ON 03.08.2011

### ASSESSMENT OF RADIOLOGICAL IMPACT OF JAITAPUR PLANT

539. DR. NILESH N. RANE:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Atomic Energy Regulatory Board is the only agency in the country with the expertise to assess the radiological impact from any nuclear activity;
- (b) if so, the details thereof;
- (c) whether the National Environmental Engineering Research Institute has expressed inability to assess radiological impacts of proposed Jaitapur Nuclear Plant in Ratnagiri in Maharashtra;
- (d) if so, the details thereof and the reasons therefor;
- (e) whether the designing of the Jaitapur Nuclear Power Plant has been given a re-look; and
- (f) if so, the changes completed so far in the designing of the plant?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)&(b) No Sir, in addition to Atomic Energy Regulatory Board (AERB), organisations like Bhabha Atomic Research Centre (BARC), Indira Gandhi Centre for Atomic Research (IGCAR) and Nuclear Power Corporation of India Ltd. (NPCIL) also have the expertise to assess the radiological impact from nuclear activity.

AERB has the mandate to perform safety review of all nuclear facilities that it licenses. As part of this review, it assesses the potential and actual radiological impact.

c)&(d) The National Environmental Engineering Research Institute (NEERI) is an expert agency for carrying out Environmental Impact Assessment (EIA) studies. NEERI has carried out the EIA studies in respect of Jaitapur Nuclear Power Project (JNPP) site in Ratnagiri District of Maharashtra. The Health Physics Division (HPD) of the BARC is the only authorised organisation having expertise with well developed techniques for assessment of radiological aspects around any nuclear facility in the country. NEERI has utilised the authentic radiological assessment data provided by HPD, BARC while preparing the EIA report in respect of the JNPP.

- (e)&(f) Detailed reviews, at each stage of the project, are carried out by experts at NPCIL and AERB to ensure safety. AERB independently carries out in-depth and independent review of the design and all aspects related to nuclear power projects before giving clearance for its implementation. While no changes are contemplated in the conceptual design, changes in the detailed designs and drawings can be made, if found necessary, on reviews.

([http://www.dae.nic.in/writereaddata/539\\_lsus030811.pdf](http://www.dae.nic.in/writereaddata/539_lsus030811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 555**  
TO BE ANSWERED ON 03.08.2011

### REVIEW OF NUCLEAR POWER POLICY

555. SHRI GURUDAS DASGUPTA:  
SHRI VILAS MUTTEMWAR:

Will the PRIME MINISTER be pleased to state:

- (a) whether Government's attention has been drawn to the decision of Germany to shut down its nuclear plants latest by 2022 in response to the rising public opinion after the Fukushima disaster;
- (b) if so, the details thereof;
- (c) whether Government has any proposal to review its nuclear power policy following Fukushima disaster; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND IN THE PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a)&(b) There had been an ongoing political debate in Germany on closing down nuclear power, even before the Fukushima incident in Japan. The recent decision, of Germany to shut down all its nuclear power plants by 2022 has to be seen in that context. Of the 17 reactors in operation in that country, 8 reactors, mostly commissioned before 1980, have been shut down and the remaining are to be shut down in a phased manner by 2022. In 2010, nuclear power contributed about 133 Billion units of electricity in Germany. Given its location, low growth in demand and import possibilities, it has other energy options. Germany is making up the loss from nuclear power from the units shut down by import of electricity, including that of nuclear power from France and Czech Republic. It plans to increase power generation from other sources including coal and gas while keeping its Green House Gas (GHG) emission targets to make up the loss from shut down of nuclear power by 2022.
- (c)&(d) India's energy resources are limited and the demand is huge and rapidly growing. In the Indian scenario, all sources of electricity generation need to be deployed optimally. Given India's energy resource profile, nuclear power is an important clean energy option for long term energy security and sustainability. It has to be pursued with enhanced emphasis on safety.

([http://www.dae.nic.in/writereaddata/555\\_lsus030811.pdf](http://www.dae.nic.in/writereaddata/555_lsus030811.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3274**  
TO BE ANSWERED ON 16.03.2011

### INDO-US NUCLEAR REPROCESSING TREATY

3274. SHRI RAMKISHUN:

Will the PRIME MINISTER be pleased to state:

- (a) whether India and USA have signed any Nuclear Reprocessing Treaty;
- (b) if so, the details thereof;
- (c) whether signing of the said treaty is directly linked to the passing of Civil Nuclear Liability Bill;  
and
- (d) if so, the reasons therefor?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a)&(b) Yes, Sir. Arrangements and Procedures Agreed between the Government of India and the Government of the United States of America pursuant to Article 6(iii) of their agreement for cooperation concerning peaceful uses of nuclear energy was signed on 30.07.2010 and came into force on 21.09.2010.

As per the Arrangements and Procedure Agreement, reprocessing of US obligated spent fuel can be carried out in India under International Atomic Energy Agency (IAEA) safeguards at two new national reprocessing facilities. No decision has been taken on the location of such facilities. Reprocessing under these arrangements can be extended to additional national facilities in India after completion of necessary steps in this regard.

(c) No Sir.

(d) Does not arise.

([http://www.dae.nic.in/writereaddata/3274\\_lsus160311.pdf](http://www.dae.nic.in/writereaddata/3274_lsus160311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3291**  
TO BE ANSWERED ON 16.03.2011

### REHABILITATION PACKAGE

3291. SHRI SIVASAMI C.:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Nuclear Power Corporation of India Ltd. (NPCIL) is facing great hardships in acquiring land for the proposed nuclear power plants in Gujarat and Maharashtra;
- (b) if so, the details thereof;
- (c) whether NPCIL have framed suitable rehabilitation packages in this regard;
- (d) if so, the details thereof; and
- (e) the steps taken/proposed to be taken by the Government to provide adequate relief/rehabilitation package to the affected people?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) Land acquisition has been completed in respect of Jaitapur site in Maharashtra and is in process at Chhaya Mithi Viridi site in Gujarat.
- (c),(d)&(e) Comprehensive Rehabilitation and Resettlement (R&R) packages are formulated by the State Governments concerned. NPCIL funds the implementation of these packages. In respect of Jaitapur site, an agreement on Rehabilitation Package has been signed between NPCIL and the Government of Maharashtra, which is being implemented. In respect of the site in Gujarat, the State Government is in the process of formulating an R&R package. The Rehabilitation package for Project Affected Families (PAFs) of Jaitapur includes, among others, providing civic amenities and facilities, employment and training, cash compensation etc. A committee comprising officials of the Government of Maharashtra and NPCIL with the District Collector as the Chairman has also been constituted by the State Government to decide on additional compensation for the land acquired.

([http://www.dae.nic.in/writereaddata/3291\\_lsus160311.pdf](http://www.dae.nic.in/writereaddata/3291_lsus160311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3331**  
TO BE ANSWERED ON 16.03.2011

### ILL EFFECTS OF RADIOACTIVE WASTE

3331. SHRI BHARTRUHARI MAHTAB:

Will the PRIME MINISTER be pleased to state:

- whether the Government has conducted any survey on ill effects of radioactive waste on the health of workers of uranium mines and their families;
- if so, the details thereof;
- whether a similar survey has been conducted by a team of Indian doctors in Jharkhand recently;
- if so, the outcome thereof; and
- the steps taken/proposed to be taken by the Government to protect the workers involved in uranium mining?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- Yes Sir. The Government conducted surveys to know the ill-effect, if any, of radioactive waste on the health of workers of uranium mines and their families.
- Uranium Corporation of India Limited (UCIL), a Public Sector Undertaking under the Department of Atomic Energy (DAE), is having an occupational health centre at Jaduguda where uranium mine workers are periodically examined as per the provisions of Atomic Energy(Radiation Protection) Rules, 2004 and the Mines Act, 1952. Occupational Health Centre also carries out health survey of the family members of the workers.

No occupational health disease of the uranium mine workers has been reported. There is an Advisory Committee of Occupational Health (ACOH) in Atomic Energy Regulatory Board (AERB) which reviews the occupational health safety status of DAE units, including uranium mines. The villages around the uranium mines, mills and tailings ponds have been surveyed from time to time by various agencies appointed by Government and the reports show that the incidence of diseases including cancer in these areas is not higher to that of national average. A health survey of 598 villagers residing near Jaduguda was carried out between January-December 2006, which included 152 males, 217 females and 229 children below the age of twelve.

As per the survey results in this group;

- No case of congenital malformation and mental retardation was detected
  - No cancer cases were found
  - The number of infertility cases amongst married woman was 2 which is below the national average
  - The villagers suffer from conventional health problems which could be seen in any village with similar socio-economic conditions.
- No, Sir.
  - Does not arise.
  - Since the radiation levels in the plant and the surrounding areas are within the permissible levels, no further steps are necessary. Periodic monitoring of health of workers in uranium mines will continue as is the current practice.

([http://www.dae.nic.in/writereaddata/3331\\_lsus160311.pdf](http://www.dae.nic.in/writereaddata/3331_lsus160311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3391**  
TO BE ANSWERED ON 16.03.2011

### INTEGRATED ENERGY POLICY

3391. SHRI RAMSINH RATHWA:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government proposes to adopt an integrated energy policy;
- (b) if so, the details thereof;
- (c) whether India has become vulnerable to uncertainty of international price and supplies; and
- (e) if so, the steps taken in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) Yes, Sir. An Integrated Energy Policy has been approved by the Government in December, 2008. The policy highlights the issues of energy demand, its availability, pricing, research & development activities, efficiencies and security of supply. The policy was prepared on the basis of the recommendations made by Expert Committee constituted by the Government in August 2004. The Expert Committee submitted its report in 2006.
- (c)&(d) The policy addresses the issues of supply, market and technical risks affecting energy security of the country.

([http://www.dae.nic.in/writereaddata/3391\\_lsus160311.pdf](http://www.dae.nic.in/writereaddata/3391_lsus160311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3415**  
TO BE ANSWERED ON 16.03.2011

### JOINT VENTURE IN NUCLEAR POWER SECTOR

3415. SHRIMATI SUPRIYA SULE:

DR. SANJEEV GANESH NAIK:

Will the PRIME MINISTER be pleased to state:

- (a) whether as part of the Government's strategy to tide over the paucity of funds and ramp up execution capability for new atomic units by bringing in cash-rich public sector undertakings, the Indian Oil Corporation Ltd. (IOCL), National Thermal Power Corporation (NTPC) and National Aluminium Company Limited (NALCO) are being roped in;
- (b) if so, whether this is being done as an alternative to letting private sector players into nuclear plant operations;
- (c) if so, the extent to which these joint venture agreements have been signed and to what extent it has been helpful to improve the atomic power units;
- (d) the total investment so far made by these organisations; and
- (e) the extent to which it has helped the new atomic units?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a)&(b) Under the provisions of the Atomic Energy Act, 1962 operation of nuclear power plants is permitted only by the Government itself or by a Government Company. Nuclear Power Corporation of India Limited (NPCIL) has comprehensive capabilities in design, construction, commissioning and operation of nuclear power plants. In view of the rapid nuclear power expansion planned using indigenous technologies and also through international cooperation, joint ventures between NPCIL and other Government companies are being formed to leverage their financial and other technological strengths in the energy sector.
- (c) A Joint Venture, between NPCIL and NTPC, Anushakti Vidhyut Nigam with NPCIL holding 51% and NTPC 49% has been incorporated in January 2011. MoUs have been signed by NPCIL with IOCL and NALCO in this regard.
- (d)&(e) The investments by these corporations are contingent to finalization of the projects to be implemented by the JVs and the business models to be adopted, which are currently under discussion. No investments have been made by these corporations yet. These JVs will help in infusing upto 49% of the equity requirements of new nuclear power projects and contribute in achieving rapid nuclear power expansion.

([http://www.dae.nic.in/writereaddata/3415\\_lsus160311.pdf](http://www.dae.nic.in/writereaddata/3415_lsus160311.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 3450**  
TO BE ANSWERED ON 16.03.2011

### REPROCESSING OF SPENT FUEL

3450. DR. NILESH N. RANE:

SHRI SAMEER BHUJBAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether spent fuel of the proposed Jaitapur Nuclear Power Plant is likely to be taken to another facility for reprocessing;
- (b) if so, the details thereof and the likely impact of this decision on the radio activity safety of the proposed plant;
- (c) the details of rehabilitation and compensation package already in place for the people affected by Jaitapur Nuclear Power Plant in Ratnagiri of Maharashtra;
- (d) whether the Government has received requests from various quarters for enhancement of the said package; and
- (e) if so, the details thereof alongwith the action taken by the Government in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a)&(b) There is no proposal of reprocessing spent fuel at the Jaitapur Nuclear Power Plant site. At site, spent fuel is stored safely only for an interim period to be later transported to a separate facility for reprocessing, strictly adhering to the regulatory guidelines for transport of radioactive materials. Therefore, this aspect has no impact of safety issues of the proposed nuclear power plant.

(c)to(e) An agreement on Rehabilitation Package has been signed between Nuclear Power Corporation of India Limited (NPCIL) and the Government of Maharashtra on 16th October 2010. The Rehabilitation Package for the Project Affected Persons (PAPs) includes, apart from compensation, rehabilitation grant; minimum lifetime pension for vulnerable persons; deserted women and shelter-less or destitute persons, providing 2 crore per affected village for civic amenities and facilities, and 25 lakh per village per year for maintenance with an escalation of this amount by 10% after every three years; provision of employment to one person from each Project Affected Family (PAF) or a lump sum one time compensation in lieu of employment; training of local people for improving their skills; provision of priority in contracts; scholarships to the wards of PAPs; and additional grant to scheduled tribe PAPs. A committee with the District Collector as Chairperson has been constituted by the Government of Maharashtra to determine additional compensation for the land acquired for the nuclear power plant.

([http://www.dae.nic.in/writereaddata/3450\\_lsus160311.pdf](http://www.dae.nic.in/writereaddata/3450_lsus160311.pdf))

## **Nuclear and Arms Control Centre**

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**Ministry of External Affairs  
LOK SABHA  
UNSTARRED QUESTION NO.3346  
TO BE ANSWERED ON 16.03.2011**

**DR. SANJEEV GANESH NAIK:**

### **CIVIL NUCLEAR AGREEMENT WITH JAPAN**

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether India has recently signed civil nuclear agreement with Japan;
- (b) if so, the salient features of the agreement; and
- (c) the likely gains to the country as a result thereof?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SMT. PRENEET KAUR)

(a) to (c) On 25th June 2010, the Government of Japan announced its decision to commence negotiations with the Government of India on an Agreement for Cooperation in the Peaceful Uses of Nuclear Energy. Negotiations are currently going on. During Prime Minister's visit to Tokyo on 24-26 October 2010 for the Annual Summit with Japan, the two Prime Ministers affirmed that cooperation in this sector will open up new opportunities for further developing the India-Japan Strategic and Global Partnership.

(<http://meaindia.nic.in/mystart.php?id=100517446>)

## Nuclear and Arms Control Centre

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Ministry of External Affairs  
RAJYA SABHA  
UNSTARRED QUESTION NO.1595  
TO BE ANSWERED ON 10.03.2011  
SHRI RAJEEV CHANDRASEKHAR:

### INCREASE OF NUCLEAR ARSENAL BY PAKISTAN

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether Government is aware of media reports that the number of nuclear arsenal in Pakistan have steadily increased since the change of guards in the US;
- (b) if so, the details thereof;
- (c) whether Government of India has taken up the matter with US Government to ensure that the financial aid being provided by Government of USA to Pakistan is not being misused; and
- (d) if so, the details thereof?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SHRI E. AHAMED)

(a) & (b) Government has seen media reports regarding increase in the size of Pakistan's nuclear arsenal. Government keeps a constant watch on all developments having a bearing on India's national interest and takes all necessary measures to safeguard it.

(c) & (d) Government of India has consistently conveyed its concern to the United States about the adverse impact of its assistance, essentially military aid, to Pakistan. The U.S. has conveyed that it is taking steps to ensure that its assistance to Pakistan is used for the stated purpose of economic development and counter insurgency and is not utilized for any other purpose or directed against any country, including India. In this context, the United States Congress passed the Enhanced Partnership with Pakistan Act, which stipulates the purposes and conditions for US economic and security assistance to Pakistan. These conditions, inter alia, require Pakistan to close terrorist camps, including those of Lashkar-e-Taiba and Jaish-e-Muhammed; cease all support to extremist and terrorist groups; and, prevent attacks into neighbouring countries.

(<http://meaindia.nic.in/mystart.php?id=100517407>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1551**  
TO BE ANSWERED ON 10.03.2011

### NUCLEAR WASTE MANAGEMENT SYSTEM

1551. SHRI RAMA CHANDRA KHUNTIA:

Will the Minister of ATOMIC ENERGY be pleased to state:

- (a) whether Government has any transparent Nuclear Waste Management System (NWMS);
- (b) if so, the details thereof;
- (c) if not, the reasons therefor; and
- (d) the fresh steps taken by Government to have a balanced and transparent NWMS?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) Yes, Sir, Government have a transparent Nuclear Waste Management System (NWMS) in place in various units of the Department of Atomic Energy.
- (b) Nuclear waste in the form of gaseous, liquid and solid is generated during various activities of nuclear energy programme. The system for the management of various type of nuclear waste is as follows:
  - (1) Gaseous waste is treated at the source of generation. The techniques used are adsorption on activated charcoal and filtration by high efficiency particulate air filter. The treated gases are then diluted with exhaust air and discharged through tall stack with monitoring.
  - (2) Liquid waste streams are treated by various techniques, such as filtration, adsorption, chemical treatment, thermal and solar evaporation, ion exchange, reverse osmosis etc.
  - (3) Solid wastes are first subjected to volume reduction techniques such as incineration and compaction. The concentrate from treatment of gaseous, liquid and solid waste are immobilized in inert materials like cement, polymer and glass.
  - (4) Solid waste with low activity content is disposed in near surface engineered facilities such as reinforced concrete trenches, the tile holes and vault. Solid waste containing higher level of radioactivity is stored in air-cooled facility for 30-50 years before their planned disposal in geological formation. The disposal facility is monitored through a systematic surveillance programme to ensure containment of radioactivity within controlled area.

In order to maintain transparency in NWMS, Department of Atomic Energy is adopting the following practices :

## **Nuclear and Arms Control Centre**

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Publication of safety codes and guides in the field of Nuclear Waste Management by Atomic Energy Regulatory Board. These publications are in open domain and are available on request.

Organisation of exhibitions on DAE programme in general and Nuclear Waste Management in particular during major conferences/symposium and other events.

Arranging out-reach programmes for public awareness in various parts of the country.

Arrangement of visits to Waste Management Facilities for the members of public living in nearby areas, school/college students & teachers, members of press/media, etc.

Scientific publications in the field of Nuclear Waste Management in various National Journals by Scientists of DAE.

(c) Does not arise in view of (a) & (b).

(d) Efforts are continuously on to update and have a balanced NWMS. For example, extensive efforts in field of research and development are being made to develop new technologies in the field of nuclear waste management for the waste likely to be generated from newer reactor systems like advanced heavy water reactors and fast breeder reactors etc. Similarly, transparency in NWMS is being maintained through the measures explained in Answer to part (b) of the Question as above.

[http://www.dae.nic.in/writereaddata/rsus1551\\_100311.pdf](http://www.dae.nic.in/writereaddata/rsus1551_100311.pdf)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
RAJYA SABHA  
UNSTARRED QUESTION NO.1552  
TO BE ANSWERED ON 10.03.2011

### FINDINGS FOR CANCER TREATMENT

1552. MS. MABEL REBELLO:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Ministry funds cancer hospitals in the country which support primarily small projects and radiation related equipment for cancer treatment;
- (b) if so, the details for the last three years, hospital-wise; and
- (c) if not, the reasons therefor?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) Yes, Sir.

(b) The Department of Atomic Energy (DAE) under its control has a fully funded autonomous institution in Mumbai, viz., Tata Memorial Centre (TMC), which is a premier cancer centre for prevention, treatment, education and research in cancer. In addition, DAE has also been releasing grant-in-aid to various cancer hospitals in the country for research, procurement of medical equipment, procurement of Bhabhatron-II etc. The details of funds released during the 2007-08, 2008-09 and 2009-10 are given in Annexure.I

(c) Does not arise, in view of the above.

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## Nuclear and Arms Control Centre

Annexure - I

### Details of Grant given to cancer hospitals by Department of Atomic Energy during 2007-08

Sl No	Name of the Hospital	Purpose	Amt. released (in Rupees)
1	Assam Medical College Hospital, Dibrugarh Assam	Cost of Blood Irradiator	24,50,000
2	B.K.L.Walawalkar Hospital, Dervan, Maharashtra	Procurement of Simulator, HDR, Telecobalt source, TPS and Dosimetry Immobilization	4,30,00,000
3	Sant Tukaram Hospital & Medical Research Centre, Akola Maharashtra	Procurement of Bhabhatron-II and Cobalt 60 source	1,40,00,000
4	Kamala Nehru Memorial Hospital, Allahabad, UP	Procurement of 150 RMM-60 Cobalt Source and Ir.192 Source	50,00,000
5	Bhagwan Mahavir Cancer Hospital & Research Centre, Jaipur, Rajasthan	Procurement of Cobalt 60 source	30,00,000
6	Indira Gandhi Institute of Medical Sciences, Patna	Procurement of Cobalt 60 source	30,00,000
7	Mahatma Gandhi Institute of Medical Sciences, Wardha, Maharashtra	Procurement of Simulator	1,50,00,000
9	Mahatma Gandhi Memorial Medical Trust, Bhimavaram AP	Procurement of Simulator, Accessories and contingency	2,30,00,000
10	Dr. B. Borooah Cancer Institute, Guwahati Assam	Procurement of equipments	2,57,00,000
11	Advanced Centre for Treatment, Research, & Education in Cancer (ACTREC), Navi Mumbai, Maharashtra	For research projects and replacement of Bhabhatron	4,30,00,000
12	Tata Memorial Centre Mumbai	DAE-Clinical Trial Centre	27,87,425
Total			17,99,37,425

## Nuclear and Arms Control Centre

### Details of Grant given to cancer hospitals by

Department of Atomic Energy during 2008-09 Sl No	Name of the Hospital	Purpose	Amt. released (in Rupees)
1	Mahatma Gandhi Institute of Medical Sciences, Wardha Maharashtra	Procurement of Simulator	45,00,000
2	Shri Siddhivinayak Ganapati Cancer Hospital, Miraj Maharashtra	Procurement of New Gamma Camera	50,00,000
3	Christian Medical College & Hospital, Ludhiana, Panjab	Procurement of Blood Irradiator	24,50,000
4	Padhar Hospital, Betul, MP	Procurement of Bhabhatron-II	1,50,19,736
5	Acharya Harihar Regional Cancer Centre, Cuttack Orissa	Procurement of Bhabhatron-II Telecobalt unit and 170 RMM Cobalt-60 source and accessories	1,75,00,000
6	Society for Applied Microwave Electronics Engineering and Research (SAMEER) Mumbai, Maharashtra	For Design and Development of Multi-leaf Collimator for use in Linear Accelerator and For services and maintenance of six units of SIDDHARTH LINAC	1,24,04,000
7	Madurai Kamaraj University, Madurai Tamilnadu	Project: "Development of drug discovery assay tools and identification of potential cancer therapeutic compounds"	66,27,931
8	Chatrapathi Sahuji Maharaj Medical University, Lucknow, UP	Procurement of Bhabhatron-II	1,75,00,000
9	Dr.B.Borooah Cancer Institute, Guwahati	Procurement of equipments	7,95,000
10	Tata Memorial Centre Mumbai	DAE-Clinical Trial Centre	1,29,55,326
Total			9,47,51,993



## Nuclear and Arms Control Centre

<b>Details of Grant given to cancer hospitals by Department of Atomic Energy during 2009-10</b>			
Sl No.	Name of the Hospital	Purpose	Amt. released (in Rupees)
1	Bhagwan Mahaveer Cancer Hospital & Research Centre, Jaipur, Rajasthan	Procurement of Iridium-192 source for Micro-selectron HDR system	30,08,000
2	Lokmanya Medical Foundation, Pune Maharashtra	Procurement of Bhabhatron-II	1,75,00,000
3	Ayurved Hospital and Research Centre, Wagholi, Pune, Maharashtra	Procurement of Bhabhatron-II	1,75,00,000
4	Mahatma Gandhi Memorial Medical Trust, Bhimavaram, AP	For Cancer Care Technology and Surgery	30,00,000
5	Padhar Hospital, Betul, MP	Procurement of equipment, Construction for Simulator & Mould Room, Mould Room Equipment, CT Scanner, Room for CT Scanner	2,35,74,636
6	Hassan Institute of Medical Sciences, Hassan Karnataka	Procurement of Bhabhatron-II	1,75,00,000
7	Vivekanand Medical Foundation & Research Centre, Latur, Maharashtra	Procurement of Bhabhatron-II	1,85,00,000
8	Indrayani Hospital, Pune Maharashtra	Procurement of Bhabhatron-II	1,85,00,000
9	Kota Cancer Society, Kota Rajasthan	Procurement of Bhabhatron-II	1,52,54,900
10	Cancer Centre Welfare Home & Research Institute, Kolkata	Procurement of Bhabhatron-II	1,55,00,000
11	Acharya Tulsi Regional Cancer Treatment & Research Institute, Bikaner Rajasthan	Procurement of Bhabhatron-II	1,62,70,800
12	Cancer Charitable Society, Gaziabad, UP	Procurement of Bhabhatron-II	1,54,62,900
13	Garud Hospital & Cancer Centre, Ahmednagar Maharashtra	Procurement of Bhabhatron-II	1,55,00,000
14	Christian Hospital, Mungeli, Chattisgarh	Procurement of Bhabhatron-II	1,72,11,300
15	Dr.B.Borooah Cancer Institute, Guwahati, Assam	Procurement of equipment	3,12,66,000
16	Tata Memorial Hospital, Mumbai	For Research Project	68,00,000
Total			25,23,48,536

[http://www.dae.nic.in/writereaddata/rsus1552\\_100311.pdf](http://www.dae.nic.in/writereaddata/rsus1552_100311.pdf)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1553**  
TO BE ANSWERED ON 10.03.2011

### **PUBLIC USE OF NUCLEAR POWER**

1553. SHRI P. RAJEEVE:

Will the PRIME MINISTER be pleased to state:

- (a) by when the first phase of nuclear power envisaged through 123 Agreement would be available for public use;
- (b) the percentage of the total power output envisaged through the deal; and
- (c) the cost of that power, per unit?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- (a) The first phase of nuclear power reactors to be set up based on international cooperation would start generation of electricity in the XIII Five Year Plan.
- (b) A total of 40,000 MW nuclear power capacity based on international cooperation is planned. This capacity is possible to be set up by 2032. The percentage of nuclear power based on international cooperation would depend on the total installed capacity from all sources in the country at that time.
- (c) The discussions on the commercial contracts for these projects are in progress and the exact tariffs will emerge on conclusion of contracts. However, it will be endeavored that the tariffs are competitive.

([http://www.dae.nic.in/writereaddata/rsus1553\\_100311.pdf](http://www.dae.nic.in/writereaddata/rsus1553_100311.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.1554**  
TO BE ANSWERED ON 10.03.2011

### SETTING UP OF NUCLEAR PLANTS

1554. SHRI SHADI LAL BATRA:

Will the Minister of ATOMIC ENERGY be pleased to state:

- the number of nuclear power plants proposed to be set up in the country during the Eleventh and Twelfth Plan, State-wise;
- the total estimated cost of each project, its production capacity of the proposed power plants, State-wise;
- the details of measures taken or proposed to be taken in the installation and commissioning/operation of these projects;
- whether Government is considering to increase the capacity of existing nuclear power plants in the country;
- if so, the details thereof; and
- if not, the reasons therefor?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

- The XI Five Year plan (Mid-Term Appraisal) envisages launch of four projects comprising of 2 x 700 MW indigenous Pressurized Heavy Water Reactors (PHWRs) each at Kakrapar in Gujarat and Rawatbhata in Rajasthan, 2 x 1000 MW Light Water Reactors (LWRs) at Kudankulam in Tamilnadu and 2 x 1650 MW LWRs at Jaitapur in Maharashtra based on international cooperation. In addition, pre-project activities in respect of two projects each of 2 x 700 MW PHWRs in Haryana and Madhya Pradesh and three each of 2 x 1000 MW or larger size LWRs in Gujarat, Andhra Pradesh and West Bengal are envisaged. The detailed XII Five Year plan proposals are yet to be finalized.

- The details of the cost and capacity of the projects already launched in the XI Five Year plan are:

Project	Location	Capacity (MW)	Completion Cost (in crore)	Scheduled completion
KAPP 3&4	Kakrapar, Gujarat	2 x 700	11459	2015-16
RAPP	Rawatbhata,	2 x 700	12320	2016-17

## Nuclear and Arms Control Centre

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The details of the capacity of projects where pre-project activities are in progress are

Location and State	To be set up in cooperation with	Capacity (MW)
Gorakhpur, Haryana	Indigenous	2 x 700
Chutka, Madhya Pradesh	2 x 700	
Kudankulam, Tamilnadu	Russian Federation	2 x 1000
Jaitapur, Maharashtra	France	2 x 1650
Kovvada, Andhra Pradesh	USA	2 x 1000*
Chhaya Mithi Viridi, Gujarat	USA	2 x 1000*
Haripur, West Bengal	Russian Federation	2 x 1000

\* Nominal Capacity

The recently approved completion cost of the indigenous PHWR projects is about 8.2 crore per one MW. The cost of projects proposed to be set up with international cooperation will depend on the business model finalized and will be known after the conclusion of Techno-Commercial contracts.

(c) The sites for setting up of the projects have been accorded 'in principle' approval. Pre-project activities including land acquisition, site investigations, statutory and regulatory clearances are in progress. Preparation of Detailed Project Report and cost estimates in respect of indigenous projects and discussions to arrive at commercial contracts in respect of projects to be set up with international cooperation is in progress.

(d) No, Sir.

(e) Does not arise.

(f) The existing reactors are already rated at optimal capacity.

([http://www.dae.nic.in/writereaddata/rsus1554\\_100311.pdf](http://www.dae.nic.in/writereaddata/rsus1554_100311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2088**  
TO BE ANSWERED ON 09.03.2011

### DISPOSAL OF NUCLEAR WASTE

2088. DR. VINAY KUMAR PANDEY 'VINNU':

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has formulated any effective plan for the disposal of nuclear waste; and  
(b) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) Yes Sir, the Government have an effective plan in place for the disposal of nuclear waste.  
(b) Nuclear waste in the form of gaseous, liquid and solid is generated during various activities of nuclear energy programme. The plan for management of various type of nuclear waste is as follows:
- (1) Gaseous waste is treated at the source of generation. The techniques used are adsorption on activated charcoal and filtration by high efficiency particulate air filter. The treated gases are then diluted with exhaust air and discharged through tall stack with monitoring.
  - (2) Liquid waste streams are treated by various techniques, such as filtration, adsorption, chemical treatment, thermal and solar evaporation, ion exchange, reverse osmosis etc.
  - (3) Solid wastes are first segregated and then subjected to volume reduction techniques such as incineration and compaction.
  - (4) The concentrate from treatment of gaseous, liquid and solid waste are immobilized in inert materials like cement, polymer and glass.
  - (5) Solid waste with low activity content is disposed in near surface engineered facilities such as reinforced concrete trenches, tile holes and vault. Solid waste containing higher level of radioactivity is stored in air-cooled facility for 30-50 years before their planned disposal in geological formation. The disposal facility is monitored through a systematic surveillance programme to ensure containment of radioactivity within controlled area.

([http://www.dae.nic.in/writereaddata/2088\\_lsus090311.pdf](http://www.dae.nic.in/writereaddata/2088_lsus090311.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2105**  
TO BE ANSWERED ON 09.03.2011

### **CONVENTION ON SUPPLEMENTARY COMPENSATION**

2105. SHRI PASHUPATI NATH SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has ratified the Convention on Supplementary Compensation developed under the auspices of International Atomic Energy Agency (IAEA) signed at Vienna;
- (b) if so, the details thereof; and
- (c) if not, the reasons therefor?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) to (c) India has signed the Convention on Supplementary Compensation (CSC) in Vienna on 27 October 2010. The Convention has not yet been ratified by India. Ratification would be possible after completion of necessary internal procedures by India.

([http://www.dae.nic.in/writereaddata/2105\\_lsus090311.pdf](http://www.dae.nic.in/writereaddata/2105_lsus090311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2112**  
TO BE ANSWERED ON 09.03.2011

### NUCLEAR REACTORS

2112. SHRI K. SUDHAKARAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government proposes to build Nuclear Reactors abroad with the collaboration of other countries to demonstrate India's ability in the nuclear energy sector; and
- (b) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a)&(b) India has developed comprehensive capabilities in all aspects of nuclear power and associated fuel cycle, with expertise in Small & Medium size nuclear power reactors (SMRs) of 220, 540, & 700 MW size. India has ambitions to export / set up nuclear power reactors in desirous friendly countries, particularly those with small grids and planning to introduce nuclear power. An export model of 220 MW Pressurised Heavy Water Reactor has also been developed in this regard.

([http://www.dae.nic.in/writereaddata/2112\\_lsus090311.pdf](http://www.dae.nic.in/writereaddata/2112_lsus090311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2183**  
TO BE ANSWERED ON 09.03.2011

### POWER FROM NUCLEAR ENERGY

2183. SHRI KACHHADIA NARANBHAI:

SHRI R.K. SINGH PATEL:

DR. M. THAMBIDURAI:

SHRI JAI PRAKASH AGARWAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether a very small part of the total electricity being generated is from nuclear energy;
- (b) if so, the comparative position of India against other countries in the production of electricity through nuclear energy;
- (c) whether the efficiency of the nuclear power plants is low;
- (d) if so, the reasons therefor; and
- (e) the steps taken by the Government in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

- (a) Yes, Sir. In India only 3% of the total electricity generated is from nuclear energy.
- (b) Nuclear power generation constitutes about 3% of the total electricity generated in the country. The low share of nuclear power in the country is due to the low capacity base of 4780 MW of the total installed capacity of 170229 MW. The comparative position vis-a-vis some other countries with nuclear power is as follows

Country	Share of Nuclear Generation (%)
France	75
Republic of Korea	34
Japan	29
USA	20
Russian Federation	18
Brazil	3
China	2

([http://www.dae.nic.in/writereaddata/2183\\_lsus090311.pdf](http://www.dae.nic.in/writereaddata/2183_lsus090311.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2193**  
TO BE ANSWERED ON 09.03.2011

### LIGHT WATER REACTORS

2193. SHRI HARISHCHANDRA CHAVAN:

Will the PRIME MINISTER be pleased to state:

- (a) the number of light water reactors functioning in the country at present, location-wise and State-wise;
- (b) whether the Government proposes to set up more light water reactors in the country during the current plan period; and
- (c) if so, the details thereof, location-wise and State-wise?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) At present there are two Light Water Reactors (LWRs) in operation at Tarapur in Maharashtra (TAPS 1&2 – 2 x 160 MW). In addition, two LWRs, being set up in technical cooperation with Russian Federation, are at an advanced stage of commissioning at Kudankulam in Tamilnadu (KKNPP 1&2 – 2 x 1000 MW).
- (b) Yes, Sir.
- (c) In the current plan period start of work on four LWRs is planned. The details are:

Project	Location	State	In Cooperation with	Capacity (MW)
KKNPP 3&4	Kudankulam	Tamilnadu	Russian Federation	2 x 1000
JNPP 1&2	Jaitapur	Maharashtra	France	2 x 1650

([http://www.dae.nic.in/writereaddata/2193\\_lsus090311.pdf](http://www.dae.nic.in/writereaddata/2193_lsus090311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2199**  
TO BE ANSWERED ON 09.03.2011

### URANIUM MINING BY PRIVATE SECTOR

2199. SHRI HANSRAJ G. AHIR:

SHRI P. KUMAR:

SHRI HARISHCHANDRA CHAVAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has any proposal to open up domestic uranium exploration and mining in line with New Exploration Licensing Policy to increase domestic output as well as to reduce dependence on import of uranium;
- (b) if so, the details thereof;
- (c) whether the Government has any proposal to allow private sector to explore and mine uranium in the country and encourage to go overseas in a big way in acquiring uranium assets for energy security of the country; and
- (d) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) No, Sir.
- (b) Does not arise in view of (a) above
- (c)&(d) At present Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of the Department of Atomic Energy (DAE) is responsible for exploration of uranium bearing minerals. However, they engage private sector for drilling and Heliborne Electro Magnetic Survey for exploration activities. Uranium Corporation of India Limited (UCIL), a Public Sector Undertaking (PSU) under DAE, is the only agency in the country which is engaged in mining of uranium bearing minerals. A proposal to form a joint venture between Nuclear Power Corporation of India Limited (NPCIL), another PSU under DAE, and UCIL (as a subsidiary of NPCIL) for acquiring uranium assets abroad will be useful for meeting India's long term nuclear fuel requirement.

([http://www.dae.nic.in/writereaddata/2199\\_lsus090311.pdf](http://www.dae.nic.in/writereaddata/2199_lsus090311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2238**  
TO BE ANSWERED ON 09.03.2011

### RESENTMENT OVER JAITAPUR ATOMIC PLANT

2238. DR. NILESH N. RANE:

SHRI ARJUN MEGHWAL:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has recently given environmental clearance to Jaitapur Nuclear Power Plant after a long wait;
- (b) if so, the details thereof;
- (c) whether the environmentalists and local people are opposing the setting up of Nuclear Power Plant as it would cause large scale damage to environment;
- (d) if so, the details thereof; and
- (e) the steps taken/proposed to be taken by the Government to address the grievances of environmentalists and local people?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a) Yes, Sir.

- (b) The Ministry of Environment and Forests (MoEF) accorded environmental clearance for setting up 6 x 1650 MW Jaitapur project on November 26, 2010 after completion of the prescribed process. The clearance stipulates 23 specific and 12 general conditions to be complied with which include preparation of a bio-diversity conservation plan and study of the environmental impact when the first stage goes into operation. The clearance is valid for 5 years. With regard to environmental clearance for JNPP, NPCIL undertook Environment Impact Assessment (EIA) study in December 2005.

The application for environmental clearance was submitted to MoEF in February 2009 as per the provisions of applicable notification. Additional terms of reference as well as directives to NPCIL to proceed with public hearing were issued in June 2009. Public hearing was organized by Maharashtra Pollution Control Board at Jaitapur site on 16th May 2010. Based on the minutes of meeting and public response of public hearing (964 pages submission by public in Marathi) were received by NPCIL on 16th July 2010. Response to the above submission by translating all submissions from Marathi to English was submitted to MoEF on 23rd September 2010. Parallely, NPCIL had various meetings with NGOs like Konkan Bachao Samithi, Mumbai on 3 occasions including at the level of Chairman, AEC & Secretary, DAE, and Bombay Natural History Society (BNHS), Mumbai, wherein all environmental and technical issues were fully addressed. In addition, NPCIL had also meetings with the representatives of various political parties from local as well as state level and addressed all the technical and environmental issues raised by them. The concern of public regarding radiation

## **Nuclear and Arms Control Centre**

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effects on human health, agricultural produce, fish yield, etc. has been addressed through interactions with Tata Memorial Centre (TMC), Fisheries Department of some universities in the region, agricultural scientists of DAE and other Institutions of the State. Environmental Appraisal Committee of MoEF visited JNPP site on 26th October 2010 and reviewed proposal of environmental clearance at Ratnagiri. Based on final submission of quarries during the above review meeting by NPCIL on 15th November 2010, MoEF accorded environmental clearance to JNPP on 26th November 2010. As a part of above environmental clearance and as per NPCIL's Corporate Social Responsibilities, MoEF desired to constitute a Committee for preparing a Bio-diversity Conservation Plan around Jaitapur region upto 10 kms.

- (c)&(d) Due to misconceptions and unfounded apprehensions regarding nuclear power and the projects, some sections of environmentalists and local people have been opposing the project.
- (e) Addressing the misconceptions and apprehensions of the environmentalists and local people have been taken up through structured public awareness campaigns. These include dissemination of the factual information regarding nuclear power and the project in print and electronic media, relevant literature in local languages, films on harmony between nuclear power & environment, organizing exhibitions on nuclear power, visits of local people to operating nuclear power stations in the country, etc. Several debates and public meetings have also been organized. In this regard, an open discussion with the participation of the surrounding population of the project was held by the Hon'ble Chief Minister of Maharashtra on January 18, 2011 where the apprehensions of the people were addressed. A high level committee, chaired by Director, Bombay Natural History Society (BNHS) and comprising of environment experts has been constituted for preparing a bio-diversity conservation plan around Jaitapur region.

([http://www.dae.nic.in/writereaddata/2238\\_lsus090311.pdf](http://www.dae.nic.in/writereaddata/2238_lsus090311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 2296**  
TO BE ANSWERED ON 09.03.2011

### SHORTAGE OF FUEL FOR ATOMIC PLANTS

2296. SHRI KUNVARJIBHAI M. BAVALIYA:

SHRI RAMSINH RATHWA:

SHRI RAYAPATI SAMBASIVA RAO:

SHRI RAM SINGH KASWAN:

Will the PRIME MINISTER be pleased to state:

- the quantum of uranium reserves with locations in the country;
- whether the country is passing through deep crisis on account of shortage of uranium;
- if so, whether the Government has conducted any survey on availability of atomic and nuclear minerals in the country;
- if so, whether the Government is working on a plan for production of uranium from country's reserves and their optimum utilization with a view to achieve self-reliance in the field of nuclear energy; and
- if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy has established 1,62,762 tonnes of Uranium resources ( $U_3O_8$ ) as on 31.12.2010. The state-wise details of the same are as follows:

STATE	ESTIMATED RESOURCES (TONNES $U_3O_8$ )
ANDHRA PRADESH	79,142
CHHATTISGARH	3,986
HIMACHAL PRADESH	784
JHARKHAND	48,074
KARNATAKA	4,682
MAHARASHTRA	355
MEGHALAYA	18,578
RAJASTHAN	6,276
UTTAR PRADESH	785
UTTARAKHAND	100
<b>TOTAL:</b>	<b>1,62,762</b>

[http://www.dae.nic.in/writereaddata/2296\\_Isus090311.pdf](http://www.dae.nic.in/writereaddata/2296_Isus090311.pdf)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO.776**  
TO BE ANSWERED ON 03.03.2011

### BARC WORKING IN AGRICULTURAL SECTOR

776. SHRI PARSHOTTAM KHODABHAI RUPALA:

Will the PRIME MINISTER be pleased to state:

- whether Bhabha Atomic Research Centre (BARC) has received any representation to work in Gujarat by using atomic energy in agriculture seed and agriculture sector;
- if so, the details of the time period in which this work would be completed;
- the details of the research work being done in this direction in Gujarat; and
- whether local people are in a state of unrest due to the setting up of atomic power plant in Mithi Viridi, the details of the steps being taken to do away the unrest?

#### ANSWER

THE MINISTER OF STATE FOR PARLIAMENTARY AFFAIRS, PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PMO (SHRI V. NARAYANASAMY)

(a),(b)&(c) Yes sir. A representation from Hon'ble Member of Parliament, Shri Parshottam Rupala, was received by the office of Hon'ble Prime Minister and Secretary, Department of Atomic Energy in this regard. A reply has already been furnished to the Hon'ble MP on 18.02.2011.

BARC has active collaboration with Directorate of Groundnut Research (DRG), Indian Council of Agricultural Research (ICAR), Junagadh and Junagadh Agricultural University. Five groundnut varieties namely tag-24, somnath, tg-26, tg-37a and tpg-41 have been released for cultivation in Gujarat through such collaboration. Besides recently released varieties like tg-38, tlg-45 and tg-51 are also popular among Gujarat farmers.

New groundnut breeding lines of BARC having resistance to disease are being evaluated by Agricultural Research Station, Talod, Gujarat. The Board of Research in Nuclear Sciences (BRNS) under DAE is funding new research projects for induced mutagenesis in groundnut to develop stem rot resistance and aflatoxin resistance in which BARC is actively collaborating with agriculture universities at Junagadh, Anand and Talod.

BARC is also supplying breeder seed of Trombay groundnut varieties every year to agriculture universities, Krishi Vigyan Kendras, Gujarat State Seed Corporation, National Seed Corporation, private companies and some farmers. They in turn carry out further seed multiplication and are distributing seeds of BARC varieties to Gujarat farmers. Feed back from farmers of Kutch-Bhuj, Jamnagar, Junagadh, Amreli, Rajkot, Surendranagar, Surat, Bama, Bhavnagar, Vadodara and near Gandhinagar is highly encouraging. Farmers are reaping yields upto 5000 kg/ha using these varieties compared to 2000 kg/ha state average.

(d) Some sections of the population at the Chhaya Mithi Viridi site in Gujarat who have certain misconceptions and unfounded fears regarding nuclear power, have expressed their concerns on the setting up of nuclear power project at the site. A structured public

## **Nuclear and Arms Control Centre**

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awareness campaign to disseminate factual information about nuclear power, the project and the benefits that would accrue from it, has been taken up to dispel such apprehensions. The campaigns have included public addresses, exhibitions, sharing of information with all stakeholders including press and media and visits of local villagers to the Kakrapar Atomic Power Station in Gujarat and Tarapur in Maharashtra. These efforts are continuing.

([http://www.dae.nic.in/writereaddata/rsus776\\_030311.pdf](http://www.dae.nic.in/writereaddata/rsus776_030311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 777**  
TO BE ANSWERED ON 03.03.2011

### DEVELOPING OF PROTOTYPE FAST BREEDER REACTOR

777. SHRI ANIL MADHAV DAVE.

Will the PRIME MINISTER be pleased to state:

- (a) whether our country is developing the prototype fast breeder reactor;
- (b) by when it is expected to be commissioned;
- (c) the status of the project;
- (d) the number of countries that have nuclear reactors using same technology; and
- (e) the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PARLIAMENTARY AFFAIRS, PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PMO (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
  - (b) The plant is expected to be commissioned during 2012-13
  - (c) The project has achieved physical progress of 66%.
  
  - (c) & (e) Russia, Japan and France have commercial nuclear reactors using similar technology.
- ([http://www.dae.nic.in/writereaddata/rsus777\\_030311.pdf](http://www.dae.nic.in/writereaddata/rsus777_030311.pdf))



## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO : 778**  
TO BE ANSWERED ON 03.03.2011

### SETTING UP OF ATOMIC PLANTS IN JAITAPUR

778. SHRI RAJKUMAR DHOOT  
will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that Government has decided to set up an atomic power plant at Jaitapur in Maharashtra;
- (b) if so, the details thereof;
- (c) whether it is also a fact that the farmers of the area and major political parties in the State are opposing the power plant;
- (d) if so, the reasons for the opposition of the atomic power plant; and
- (e) the remedial and amicable measures Government proposes to take in this regard?

#### ANSWER

THE MINISTER OF STATE FOR PARLIAMENTARY AFFAIRS, PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PMO (SHRI V. NARAYANASAMY)

- (a) Yes, Sir.
- (b) Six nuclear power reactors, each of 1650 MW in technical cooperation with Areva, France are planned to be set up at Jaitapur, Maharashtra, in a phased manner, starting initially with setting up of two reactors.
- (c) Some sections of the local people are opposing the project.
- (d) The reasons for opposition are largely due to the misconceptions and unfounded apprehensions regarding nuclear power.
- (e) For addressing the misconceptions and apprehensions, several steps have been taken up through structured public awareness campaigns. These include dissemination of the factual information regarding nuclear power and project in print and electronic media, relevant literature in local language, films on harmony between nuclear power and environment, organizing exhibitions on nuclear power, visits of local people to operating nuclear power stations in the country etc. Several debates and public meetings have also been organized. In this regard, an open discussion with the stake holders of the project was held by the Hon'ble Chief Minister of Maharashtra on January 18, 2011 where the apprehensions of the people were addressed.

([http://www.dae.nic.in/writereaddata/rsus778\\_030311.pdf](http://www.dae.nic.in/writereaddata/rsus778_030311.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 311**  
TO BE ANSWERED ON 24.02.2011

### ATOMIC ENERGY PROJECT IN JAITAPUR

311. SHRI RAVI SHANKAR PRASAD:

SHRI RAMACHANDRA PRASAD SINGH:

Will the PRIME MINISTER be pleased to state:

- (a) whether it is a fact that an atomic energy project at Jaitapur in India is being set up in collaboration with a France based reactor manufacturing company Areva S.A;
- (b) if so, the details of the agreement signed with the foreign company in this regard;
- (c) whether the production cost of the electricity to be generated under the project has been estimated; and
- (d) if so, the initial production cost of electricity generated by this project?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) Yes, Sir.
- (b) Pursuant to the Inter-Governmental Agreement (IGA) on co-operation for peaceful uses of nuclear energy signed between India and France on 30th September, 2008 and the Memorandum of Understanding (MoU) signed between Nuclear Power Corporation of India Limited (NPCIL) and Areva, France on 4th February, 2009, a General Framework Agreement (GFA) and an Early Works Agreement (EWA) were signed on 6th December, 2010 between NPCIL and Areva. While the GFA covers scope of work, division of responsibility, design, material, technology and services and life time fuel supplies for the initial set of 2X1650 MW EPR nuclear power reactors, the EWA covers preliminary works like design, engineering and regulatory aspects.
- (c)&(d) The Techno-commercial contract agreement is still under discussion. The tariff of electricity from the project will emerge on conclusion of the agreement.

([http://www.dae.nic.in/writereaddata/rsus311\\_240211.pdf](http://www.dae.nic.in/writereaddata/rsus311_240211.pdf))

## Nuclear and Arms Control Centre

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 312**  
TO BE ANSWERED ON 24.02.2011

### URANIUM EXPLORATION IN ANDHRA PRADESH

312. SHRIMATI GUNDU SUDHARANI:

Will the PRIME MINISTER be pleased to state:

- whether as per the Atomic Minerals Directorate for Exploration and Research, Andhra Pradesh has the highest Uranium resources to the tune of 66205 tonnes in the country;
- if so, the details thereof, district-wise;
- the amount of Uranium so far explored from Andhra Pradesh; and
- the efforts Ministry is making to explore the Uranium for use in the production of atomic energy?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a) to (c) Yes, Sir. The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent Unit of the Department of Atomic Energy has established a total of 1,62,762 tonnes of Uranium resources ( $U_3O_8$ ) in the country. Out of this, 79,142 tonnes of uranium resources have been established in the state of Andhra Pradesh. The location-wise details for Andhra Pradesh are given below:

Sr. No.	Name of the Deposits	District	Uranium Resources established ( $U_3O_8$ ) (Figures in Tonnes)
1.	Lambapur	Nalgonda	1,450
2.	Peddagattu	Nalgonda	7,585
3.	Tummalapalle- Rachakuntapalle	YSR Kadappa	58,873
4.	Koppunuru	Guntur	2,761
5.	Chitrial	Nalgonda	8,473
<b>Total:</b>			<b>79,142</b>

- (d) Exploration efforts of uranium minerals are further intensified. The Time domain electromagnetic (TDEM) survey has been adopted for exploring deep seated uranium deposits. Further detailed exploration through radiometry and drilling is being undertaken where conductivity anomalies are identified by TDEM survey.

([http://www.dae.nic.in/writereaddata/rsus312\\_240211.pdf](http://www.dae.nic.in/writereaddata/rsus312_240211.pdf))

## Nuclear and Arms Control Centre

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**Ministry of External Affairs  
RAJYA SABHA  
UNSTARRED QUESTION NO.361  
TO BE ANSWERED ON 24.02.2011**

**SHRI N. K. SINGH:**

### **NUCLEAR TREATIES WITH FOREIGN COUNTRIES**

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the operations of French and US companies for building nuclear reactors in India are dependent on nuclear cooperation negotiations with Japan;
- (b) if so, the status of India's negotiations with Japan in this regard; and
- (c) the conditions that Japan is expected/has made for signing with nuclear treaty?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SHRI E. AHAMED)

(a) No.

(b) & (c) On 25th June 2010, the Government of Japan announced its decision to commence negotiations with the Government of India on an Agreement for Cooperation in the Peaceful Uses of Nuclear Energy. Three rounds of negotiations have been held in June 2010, October 2010 and November 2010. During Prime Minister's visit to Tokyo on 24-26 October 2010 for the Annual Summit with Japan, the two Prime Ministers affirmed that cooperation in this sector will open up new opportunities for further developing the India-Japan Strategic and Global Partnership.

(<http://meaindia.nic.in/mystart.php?id=100517291>)

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**STARRED QUESTION NO. 25**  
TO BE ANSWERED ON 23.02.2011

### SETTING UP OF NUCLEAR POWER PROJECTS

\*25. SHRI SANJAY BRIJKISHOR LAL NIRUPAM:

SHRI NAMA NAGESWARA RAO:

Will the PRIME MINISTER be pleased to state:

- (a) the number of nuclear power projects set up/proposed to be set up in the country during the Eleventh and Twelfth Plans, State-wise;
- (b) the total estimated cost of each project, its capacity and the time frame for commissioning of the proposed power stations;
- (c) the various safeguards taken or proposed to be taken in the installation and operation of these projects;
- (d) whether the proposal to increase the power generation capacity of power station at Tarapur, Maharashtra is under consideration of the Government; and
- (e) if so, the details thereof?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

(a) to (e) A statement is laid on the table of the House:

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STATEMENT REFERRED TO IN REPLY TO LOK SABHA STARRED QUESTION NO. 25 FOR ANSWER ON 23.02.2011 BY SHRI SANJAY BRIJKISHOR LAL NIRUPAM AND SHRI NAMA NAGESWARA RAO REGARDING SETTING UP OF NUCLEAR POWER PROJECTS.

- (a) Two nuclear power projects, Kaiga 3&4 (2 x 220 MW) in Karnataka and RAPP 5&6 (2 x 220 MW) at Rawatbhata in Rajasthan have been completed so far in the XI Plan period. Two more projects Kudankulam, Units-1&2 (2 x 1000 MW) in Tamilnadu and a PFBR (500 MW) at Kalpakkam in Tamilnadu are at advanced stage of completion. The XI plan Mid-Term-Appraisal (MTA) envisages launch of four projects comprising of 2 x 700 MW indigenous Pressurized Heavy Water Reactors (PHWRs) at Kakrapar in Gujarat and Rawatbhata in Rajasthan, 2 x 1000 MW Light Water Reactors (LWRs) at Kudankulam in Tamilnadu and 2 x 1650 MW LWRs at Jaitapur in Maharashtra based on international cooperation. In addition, pre-project activities in respect of two projects each of 2 x 700 MW PHWRs in Haryana and Madhya Pradesh and three each of 2 x 1000 MW or larger size LWRs in Gujarat, Andhra Pradesh and West Bengal are envisaged. The detailed twelfth plan proposals are yet to be finalized.

## Nuclear and Arms Control Centre

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- (b) The details of the cost, capacity and time frame of the projects already launched in the XI Plan are :

<b>Project</b>	<b>Location</b>	<b>Capacity (MW)</b>	<b>Completion Cost ( ₹ crore)</b>	<b>Scheduled completion</b>
KAPP 3&4	Kakrapar, Gujarat	2 x 700	11459	2015-16
RAPP 7&8	Rawatbhata, Rajasthan	2 x 700	12320	2016-17

([http://www.dae.nic.in/writereaddata/lssq25\\_230211.pdf](http://www.dae.nic.in/writereaddata/lssq25_230211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 308**  
TO BE ANSWERED ON 23.02.2011

### SUPPLY OF URANIUM FROM AUSTRALIA

308. SHRI DUSHYANT SINGH:

SHRI DHARMENDRA YADAV:

SHRI SANJAY SINGH CHAUHAN:

SHRI ARVIND KUMAR CHAUDHARY:

SHRI ANANDRAO ADSUL:

Will the PRIME MINISTER be pleased to state:

- (a) whether several foreign countries have been supplying enriched uranium to our nuclear power plants during the recent past;
- (b) if so, the quantity and value of uranium supplied by them during each of the last three years, country-wise;
- (c) whether the Australian Government in the recent past has not honoured its commitment in supplying the agreed quantity of the enriched uranium to our country; and
- (d) if so, the efforts made by the Government to ensure adequate supply of uranium by Australian Government?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) In the recent past only Russia has supplied enriched uranium to our nuclear power plants.
- (b) In the year 2009, M/s. TVEL Corporation, Russia has supplied 58 Metric Tonnes of enriched uranium dioxide pellets worth 480.47 cr.
- (c) No contracts have been signed with the Australian Government for supply of uranium.
- (d) Does not arise.

([http://www.dae.nic.in/writereaddata/308\\_lsus230211.pdf](http://www.dae.nic.in/writereaddata/308_lsus230211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 324**  
TO BE ANSWERED ON 23.02.2011

### DEATHS OF SCIENTISTS IN BARC

324. SHRI INDER SINGH NAMDHARI:

SHRI ANTO ANTONY:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has any information regarding the number of the unnatural deaths of the scientists in the Bhabha Atomic Research Centre (BARC) and Kaiga Atomic Power Station (KAPS);
- (b) if so, the details thereof and the reasons therefor;
- (c) whether the Government has distributed compensation to the relatives of the deceased scientists in BARC and KAPS;
- (d) if so, the details thereof and if not, the reasons therefor and the steps taken by the Government in this regard;
- (e) whether the Government has conducted any inquiry into these unnatural deaths and other casualties in the nuclear installations in the country;
- (f) if so, the findings of the said study; and
- (g) the steps taken by the Government to prevent casualties and ensure safety in nuclear installations in the country?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY)

(a) Yes, sir.

(b) During the last three years number of unnatural deaths of scientists in BARC is as under:

- 1) 2008 - 1 case of accident
- 2) 2009 - 2 Research Fellows in a fire accident
- 3) 2010 - 2 case of suicide and 1 is under Police investigation

There were four instances of unnatural deaths of scientists at Kaiga Generating Station (KGS) during last five years is as under:

- 1) 2005 – 1 case of Industrial accident at the site.
- 2) 2008 – 1 case of Road accident outside the site boundary
- 3) 2009 – 2 cases - dead bodies of the employees were found in the township and in the Kali river. The state Police are investigating these two cases.

None of these unnatural deaths is connected to radiation exposure.

(c) Yes, sir.

(d) The terminal benefits admissible to the family members of the above BARC officials have been distributed as per the status given in the annexure. The Kaiga



## **Nuclear and Arms Control Centre**

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Generating Station has paid the compensation under Workmen's Compensation Act to the next of kin of the employee who died in the industrial accident at the site, in addition to settlement of final dues. In respect of the other two cases, ex-gratia / final dues have been paid to next of kin. The payment of ex-gratia and final dues is awaiting final orders of the court identifying the legal heir in the remaining one case.

(e) Yes, sir.

(f) In BARC, Police have registered criminal cases and conducted investigation into the cases of road accident and suicides. It has not been reported that the suicides are in any way attributable to the working conditions or connected with their official activities. An industrial accident enquiry by the industrial safety organization has been concluded at Kaiga Generating Station. The other three cases where FIRs were lodged, enquiry by Police is in progress. Further, the final report of the Police investigation findings has not been received in respect of the two cases where dead bodies were discovered in Kali river and in the township.

(g) BARC has taken concrete steps in enhancing fire and road safety. Recommendation of AERB on strengthening industrial safety in KGS have been implemented.

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### Annexure

#### The terminal benefits paid to the family members of the deceased scientists

Sl.No.	Name of the deceased scientists	Amount Paid to relatives	
1	A.G. Poddar, SO/C, WMD, BARC on 27.3.2008 – Road Accident	Final settlement of dues – Rs. 1,81,575/- Group Insurance – Rs. 1,57,764/- - Death Gratuity – Rs. 5,86,210/- Family Pension paid to his wife. - as per rules.	
2	i) Uman Sing, Sr. Research Fellow, BARC, Trombay - In 2009 Fire Accident.	One time compensation - to the parents.	10,00,000/-
	ii) Partha Pratim Bag, Jr. Research Fellow, BARC, Trombay - In 2009 Fire Accident	One time compensation - to the parents.	10,00,000/-
3	M.P. Iyer, SO/F, RRDPD on 23.2.2010 – under Police investigation.	Death Gratuity - Family Pension to - his mother	9,20,000/- as per rules.
4	Titas Pal, SO/C, RCD, BARC - on 3.03.2010 - Suicide	Settlement of dues is pending as the nominees have not submitted the claim forms, in spite of reminders.	-
5	Soumik Chowdhury, SO/C, Computer Division, BARC – 1.11.2010 - Suicide	Settlement of dues is pending as the nominee has not submitted the claim forms, in spite of reminders.	-

([http://www.dae.nic.in/writereaddata/324\\_lsus230211.pdf](http://www.dae.nic.in/writereaddata/324_lsus230211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 334**  
TO BE ANSWERED ON 23.02.2011

### NUCLEAR AGREEMENT

334. SHRI LAL CHAND KATARIA:

Will the PRIME MINISTER be pleased to state:

- (a) whether any nuclear agreement for peaceful use of nuclear energy has been signed between India and France during the recent visit of the President of France;
- (b) if so, the details thereof; and
- (c) the locations and the time by which the proposed nuclear power reactors are likely to be set up under the said agreement?

#### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) Yes, Sir.
- (b) Pursuant to the Inter-Governmental Agreement (IGA) on co-operation for peaceful uses of nuclear energy signed between India and France on 30th September, 2008 and the Memorandum of Understanding (MoU) signed between Nuclear Power Corporation of India Limited (NPCIL) and Areva, France on 4th February, 2009, a General Framework Agreement (GFA) and an Early Works Agreement (EWA) were signed on 6th December, 2010 between NPCIL and Areva. The GFA covers the installation of initial set of 2x1650 MW EPR nuclear power reactors including, scope of work, division of responsibility, design, material, technology and services and life time fuel supplies, the EWA covers preliminary works related to design, engineering and regulatory aspects.
- (c) The nuclear power reactors will be set up at Jaitapur in Maharashtra. The schedules will be finalized as a part of the techno-commercial agreement, currently under discussion.

([http://www.dae.nic.in/writereaddata/334\\_lsus230211.pdf](http://www.dae.nic.in/writereaddata/334_lsus230211.pdf))

## **Nuclear and Arms Control Centre**

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 398**  
TO BE ANSWERED ON 23.02.2011

### **SHIFTING OF NUCLEAR POWER PLANT**

398. SHRI VILAS MUTTEMWAR:

Will the PRIME MINISTER be pleased to state:

- (a) whether the Government has recently decided to shift the location of proposed Nuclear Power Plant in Haripur in West Bengal to Orissa;
- (b) if so, the reasons therefor; and
- (c) the time by which a final decision is likely to be taken?

#### **ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) No, Sir.
- (b)&(c) Do not arise.

([http://www.dae.nic.in/writereaddata/398\\_lsus230211.pdf](http://www.dae.nic.in/writereaddata/398_lsus230211.pdf))

## Nuclear and Arms Control Centre

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GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO. 452**  
TO BE ANSWERED ON 23.02.2011

### WATER REACTORS

452. SHRI HARISHCHANDRA CHAVAN:

Will the PRIME MINISTER be pleased to state:

- (a) whether Pressurised Water Reactors (PWRs) are the latest technology available in Nuclear Power Generation; and
- (b) if so, the action taken/proposed to be taken to replace existing nuclear reactors of Tarapur Atomic Power Plant with PWRs for better results?

### ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS  
AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) State of the art designs based on different nuclear fuels are available in different types of nuclear power reactor technologies. These are Pressurised Heavy Water Reactors (PHWRs), Boiling Water Reactors (BWRs), Pressurised Water Reactors (PWRs) and Fast Breeder Reactors (FBRs). Each of these technologies has distinct advantages and the reactor choice is country specific. Out of the 442 nuclear power reactors in operation world over, there are 269 PWRs, 92 BWRs, 47 PHWRs and 1 FBR.
- (b) There are two first generation BWRs – TAPS 1&2 (2x160 MW) and two latest PHWRs – TAPS 3&4 (2x540 MW) in operation at Tarapur in Maharashtra. TAPS-1&2 has also been brought to the state of the art by upgradation and life extension measures. There is no proposal to replace the existing reactors at Tarapur.

([http://www.dae.nic.in/writereaddata/452\\_lsus230211.pdf](http://www.dae.nic.in/writereaddata/452_lsus230211.pdf))

## **Nuclear and Arms Control Centre**

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**Ministry of External Affairs  
LOK SABHA  
UNSTARRED QUESTION NO.420  
TO BE ANSWERED ON 23.02.2011**

SHRI JAI PRAKASH AGARWAL:

### **SETTING UP OF NUCLEAR PARK BY PAKISTAN**

Will the Minister of EXTERNAL AFFAIRS be pleased to state:

- (a) whether the Pakistan is preparing to set up nuclear park;
- (b) if so, the details thereof; and
- (c) the reaction of the Government thereto?

ANSWER THE MINISTER OF STATE IN THE MINISTRY OF EXTERNAL AFFAIRS  
(SMT. PRENEET KAUR)

(a) to (c) Government has seen press reports about Pakistan's interest in setting up "Nuclear Parks" as a means to attract foreign investors interested in setting up private nuclear power plants. The stated reason for this is to meet the country's growing energy requirements.

**([HTTP://MEAINDIA.NIC.IN/MYSTART.PHP?ID=100517245](http://meaindia.nic.in/mystart.php?id=100517245))**