

## Founder's Day 2016

Address by

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**Chairman, AEC & Secretary, DAE**

Good morning to all of you, Senior Members of the DAE Family, Distinguished Invitees, Representatives from Media, my dear Colleagues and Friends, I extend warm welcome to all of you, to this Founder's Day celebrations, to pay respectful homage to our visionary Founder, Dr. Homi Jehangir Bhabha, on his 107th birth anniversary. This is a day for us to reflect on our recent performance and achievements and also re-dedicate ourselves to realise the vision of our Founder for the continued development in the field of nuclear energy and nuclear applications, to bring prosperity for all.

Dear Friends,

I will talk about our recent activities; re-grouped as per the document presented to the NITI Aayog on DAE vision, action plan and strategy. Let me start with the first stage of Indian Nuclear Power Programme. In the last budget speech, Honourable Finance Minister has indicated funding to the extent of Rs.3,000 crores on a continuous basis for the nuclear power programme. We have proposed capacity addition of 2.5 to 3 GWe every year for next 15 to 20 years. In addition to about 5.7 GWe power generating capacity, we are also constructing 10 reactors which will add 7.7 GWe by 2024. We have approached the government for sanction of serial construction of 10 PHWRs in one go. The arrangements for Kudankulam Units 5&6 is also likely to be finalised shortly.

You are aware that Kudankulam Unit 1 is performing consistently at full power since February 2016 and Kudankulam Unit 2 has been synchronised to the grid. Construction activity for Kudankulam Units 3&4 has also been started. Recent incident of pressure tube failure in Kakrapar Atomic Power Station Unit 1 proved the excellent performance of our safety systems following the event. Our operators and designers rose to the occasion to handle this incident in Level-1 category without any problems. Both KAPS-1&2 are now taken up for en masse coolant channel replacement (EMCCR). First 700 MWe PHWR, KAPS – 3 is likely to go critical by next year and we expect to commission the other 3 reactors at KAPS and RAPS over the next 3 years. Our Heavy Water Plants worked at 105% capacity and we are exporting heavy water in small quantities to the developed nations. Nuclear Fuel Complex (NFC) created world record last year by producing 1500 Tonnes of PHWR fuel.

**Dear Colleagues,**

On the Uranium front, I am glad to announce that problems at Tummalapalle has been sorted out and uranium production is increasing in a systematic manner. To increase the overall

production in the country, we have started work for opening up new mines at Rohil and Gogi. Uranium exploration in Kadappa basin and North-East is also being stepped up. Recently our exploration activities in Gondwana basin, Betul District of Madhya Pradesh has also given encouraging results. In the second stage of our nuclear power programme,

I am happy to inform that Prototype Fast Breeder Reactor (PFBR) commissioning activity is progressing well. After completion of all system checks and rectifications pressure testing and pre-heating activity prior to sodium filling will be completed by the year end. Regulatory requirements are also being addressed in a systematic manner. I must also mention about the never before performance of our nuclear recycle plants, resulting in delivery of first core for PFBR. Production of fuel for first refuelling of PFBR is in hand. Construction of large sized Integrated Nuclear Recycle Plant, along with fuel fabrication facility has been started at Tarapur. Construction activity for Fast Reactor Fuel Cycle Facility (FRFCF) is also picking up at Kalpakkam.

Dear Colleagues and Friends,

The health care sector, got major boost, with the construction activities for 2 new hospitals at Vizag in Andhra Pradesh and Mohali in Punjab. The facility at Vizag is already providing cancer care in 7 specialised areas from temporary sheds. Through National cancer grid, 85 hospitals have been connected for providing health care support to all the smaller centres and deliver uniform quality of health care throughout the country. A 60 bedded hospital at Sangrur, Punjab, built with the help from State Government, is providing cancer care in 6 specialised areas. We have also started work for creation of Radiation Medicine Research Centre (RMRC) at our Rajarhat campus in Kolkata. After successful launch of cancer App during the last IAEA General Conference, another App for cancer staging for gynaecological cancer care was launched during the IAEA General Conference in Vienna in 2016. BRIT has supplied cesium pencils for blood irradiators for 4 hospitals. Development of cancer drugs for making cancer care affordable is going on well and some of the drugs developed by our scientists are undergoing field trials. On the food security front, We have released TM-108-1 high yielding mustard seed for Maharashtra. Two soya bean mutants resistant to bacteria and virus and one early maturing variety are undergoing trial. 460 quintals of breeder seeds of different TG varieties were distributed in 9 States.

A Gazette notification has been issued for approval of radiation processing of food in May2016. This covers all types

## BARC Celebrates Founder's Day

of food products, food packaging material, food additives, for decontamination, disinfection and sterilisation. In the area of water and waste management, increasing popularity of NISARGRUNA has resulted in addition of 15 plants in the last year in various parts of the country. We have taken up projects for treatment of textile dye effluent using a mix of technologies. The feasibility of textile dye effluent treatment using electron beam was demonstrated in small scale at Kharghar. Demonstration facility for effluent treatment by radiation grafting process is being fabricated for trials at Surat and Ahmedabad. Dry sludge hygienisation facility coming up at Ahmedabad will be commissioned next year. We expect more interest in this technology after this plant goes into operation.

Dear Friends,

In Mega Science schemes, Laser Interferometer Gravitational-Wave Observatory (LIGO) has been approved by the government in principle and it has been decided to build the facility at Hingoli, for which Maharashtra government has allocated 40 acres of land and the rest is being acquired. With the shipment of camera, MACE telescope construction got a major boost and now we expect it to be fully commissioned by 2017. Fermilab collaboration for construction of high energy accelerator is making progress and components made in India are being tested at Fermilab for acceptance. Tests conducted so far has given very encouraging results. In the area of basic research and science education, our National Institute of Science Education and Research (NISER) was dedicated to the nation by our Hon'ble Prime Minister in the Month of February 2016.

NISER is offering science education through 5 different schools and is making outstanding contributions to science education, I am glad to announce that Prof. B. Mohanty from this institute was awarded Shanti Swarup Bhatnagar Award 2015 for Physics. HBNI administrative arrangements has been streamlined after the acceptance of HBNI MoA/Rules by Charity Commissioner. National Institute Ranking Framework has ranked HBNI 17th. This is likely to improve substantially once the institute's name is mentioned in the students publication. During this period, Tata Institute of Fundamental Research (TIFR) has discovered superconductivity in pure Bismuth at 500 micro Kelvin. TIFR has also developed 3 out of 5 major instruments being used at ASTROSAT satellite, and they are functioning well. CERN authorities has agreed to the proposal of India joining the CERN programme as Associate Member and the agreement is likely to be signed next month.

Dear all,

In the area of directed research, the following were some of the major developments : Last year Dhruva reactor was operated at highest ever capacity factor and Fast Breeder Test Reactor

(FBTR) at Kalpakkam has been operated at highest ever power during this period. Metallic fuel irradiation for future metallic fuel FBRs has been started at FBTR. Synchrotron facility at Indore continue to be used on 24 x 7 basis and all the beamlines are used by scientists and students from all over the country. Country's first infra-red free electron laser is being built in a 60 M shielded tunnel at Indore. Sub-systems for this facility are being tested. Acceleration of protons upto 11 MeV and of carbon ions upto 14.5 MeV has been achieved using ultra-intense Ti:sapphire femtosecond laser.

Director, BARC has already covered the developments in BARC in the area of directed research. Our pavilion at the General Conference in IAEA attracted a large number of students and scientists from all over the world. Many countries expressed desire to collaborate with us in Nuclear application area. Dear Friends, During the 60th year of IAEA at the General Conference, we highlighted the contribution of Dr. Homi Jehangir Bhabha, who was not only the founder of India's atomic energy programme, but also shaped the evolution of IAEA. You may be aware of the fact that Dr. Bhabha had great appreciation for cultural and musical heritage of Vienna. As the Chair of the body entrusted with the responsibility of selection of headquarters of IAEA, Dr. Bhabha used his casting vote for selection of Vienna as IAEA headquarters over Geneva. Some of our other achievements can be summarised as follows:

Atomic Energy Act was amended to make it possible for Nuclear Power Corporation of India Limited (NPCIL) to form Joint Ventures with other PSUs for production of nuclear power. Civil Nuclear Liability issues were addressed by the introduction of Operators' Policy and Suppliers' Policy through India Nuclear Insurance Pool. Ratification of IAEA's Convention on Supplementary Compensation also happened this year. India participated in the Nuclear Security Summit at Washington at the highest political level and is contributing to various global initiatives on combating nuclear terrorism.

Dear Colleagues,

I thank all of you for your achievements. But we have much more to do. It will be worthwhile to tell you about our proposal to NITI Aayog about the 15 year Vision Scheme, 3 year Action Plan and 7 year Strategy. We have proposed 10 schemes with the following vision:

1. Creation of 2.5 to 3 GWe (average capacity) per year for next 15 to 20 years.
2. Ten fold rise in exploration and production of uranium and rare earths to achieve self-sufficiency.
3. Ten fold rise in power from Fast Breeder Reactors (FBR) and creation of matching fuel cycle facilities in the back end.
4. Affordable cancer care for 5 lakh new patients per year and decreasing the cancer mortality rate by 15%.

5. Creation of networks and Facilities to provide food security through nuclear agriculture and food preservation for 10% of the Indian population.
6. Management of Municipal waste in 50 cities and providing water purification facilities for 20000 villages.
7. Completion and utilisation of various accelerator programmes, India-based Neutrino Observatory (INO), Laser Interferometer Gravitational Observatory (LIGO), European Centre for Nuclear Research (CERN), International Thermonuclear Experimental Reactor (ITER) etc.
8. Pursuing curiosity driven basic research programmes for understanding the fundamental nature of processes, creation of knowledge base and science education.
9. R&D activities directed towards achieving specific objectives of the Department in the nuclear and allied fields.

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

Action plan is an integral part of the Vision Document. Presently we are working on elaboration of the action plan. Involvement of other central ministries and state governments will be key to the implementation of these programmes. Improved monitoring will also be essential component of our action plan.

Dear All,

Today, I see growing optimism, both at national and global level, about the growth of Indian nuclear programme. Our COP-21 commitments on carbon emission, and our growth potential in the uranium production, health care and other sectors capable of providing direct benefit to the society; has created great opportunity for us to deliver. Everybody is waiting for us to act.

Thank you and Jaihind