

**SPEECH BY THE PRESIDENT OF INDIA, SHRI PRANAB MUKHERJEE
ON THE OCCASION OF GRADUATION FUNCTION OF BARC
TRAINING SCHOOL**

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It is indeed a privilege for me to be present amidst you this afternoon at the Bhabha Atomic Research Centre. This institution is itself the hub of our national research effort in the nuclear domain. Indeed, BARC has emerged as an important place in the front rank in Atomic Research in the global nuclear map.

Our first Prime Minister Pt. Jawaharlal Nehru had a keen appreciation of the importance of atomic energy. At the inauguration of India's first nuclear reactor in Trombay in 1957, he observed that the "atomic revolution" was as seminal an event as the industrial revolution, Pt. Nehru said "either you go ahead with it, or you succumb and others go ahead, and you fall back and gradually drag yourself along in the trail." Similarly, at the opening of the CIRUS research reactor at Trombay in 1961, he commented "if you have the picture of the future of India ... you will come to the conclusion of the inevitability of our building up atomic energy for peaceful purposes."

This vision of Pandit Nehru was translated into reality by Dr.HomiJehangirBhabha. Dr.Bhabha established the Tata Institute of Fundamental Research in 1945, and post-independence, almost single-handedly created the architecture required to make India a nuclear power. Dr.Bhabha was an institution builder, and laid an enduring and comprehensive foundation for the entire nuclear programme. With acumen and foresight, Dr.Bhabha said, "When nuclear energy has been successfully applied to power production, in say, a couple of decades from now, India will not have to look abroad for its experts but will find them ready at hand." This Training School established in 1957 is a product of this wisdom. It has over the years served to produce a large pool of highly qualified scientists and researchers and ensured that our programme is self reliant. The creation of the HomiBhabha National Institute (HBNI) as the academic wing of DAE in 2005, currently an 'A grade' Deemed-to-be-University, is yet another important milestone in our quest for building a reservoir of experts.

India has an enormous requirement of electrical power for accelerating economic growth for raising the living standards of the vast majority of our people. It is essential that we harness energy from all the possible sources, conventional and non-conventional alike, for ensuring sustainable energy security. The need for assured base-load energy availability throughout the year in all regions across our large country makes nuclear energy an indispensable option in the energy-mix for India. In this context, Dr.Bhabha formulated a well-drawn-out three stage programme of nuclear power production, involving the closed fuel cycle option, to make full use of available nuclear fuel. India has established mastery over the entire fuel cycle for the Pressurised Heavy Water Reactor based nuclear power plants in the first stage and is making progress in

the march towards the second stage. Work on the Prototype Fast Breeder Reactor at Kalpakkam is at an advanced stage. Alongside, Indian industry too has developed and provided valuable support to the country's nuclear programme.

The technology denial regime thrust on us post-1974, only enhanced our determination to expeditiously pursue indigenisation and innovation efforts, as well as build self-reliance in the entire range of activities in the domain of nuclear energy, namely, reactor technologies, fuels and fuel cycle facilities, and all other allied requirements. Commendable success has been demonstrated by BARC in the fields of reprocessing and enrichment, making use of entirely indigenous efforts and resources. The Civil Nuclear Cooperation Agreements concluded over the last eight years or so have ended our nuclear isolation and brought acknowledgement for the vigour and range of our nuclear programme. We are today also involved in several multilateral mega-science initiatives, such as the CERN-LHC discovery of Higgs-Boson particle and the International Thermonuclear Experimental Reactor.

Indigenisation efforts must continue even as we embrace nuclear power collaboration with our international partners in the wake of the civil nuclear initiative. I call on the Atomic Energy community to gear up for the absorption of LWR technology, maximising synergies across indigenous and foreign technologies so that nuclear power can be delivered affordably and safely to the Indian masses.

We can justifiably be proud of our achievements in the domain of nuclear energy across the entire nuclear fuel cycle. I am happy to note that a few new facilities in frontier science and technology areas have been remotely inaugurated today. We cannot, however, rest on our laurels. Several other similar new facilities and systems in many more areas of application of technology require to be established and operated in the years to come.

Non-power applications of atomic energy in the areas of health care, food and agriculture, water resources management, and environmental protection is much less known to society at large. Hundreds of medical centres in the country are using radioisotope products - radiopharmaceuticals and radiation sources - supplied by DAE for diagnostics and therapy of patients. BARC's development initiatives and facilitated delivery of an indigenous teletherapy machine, and a simulator, support cost-effective cancer care to patients our distinguished achievements in these areas. The Tata Memorial Centre, an autonomous centre functioning under DAE administration, has created a name for itself.

In the application of nuclear techniques in food and agriculture, I am happy to learn that you have introduced 41 mutant crops till date, mostly oil seeds and pulses, with enhanced or early yield and disease resistance. The most popular crop mutant groundnut variety, called TAG-24, has been chosen to be dedicated today to the nation. The involvement of several agricultural Universities in the joint development and propagation of mutant crops, and engagement of private sector in setting up radiation processing plants for preservation of food products

(for enhancing shelf-life and marketability of many agro and food products, including for export purposes e.g. spices, mangoes) are important strategies adopted by the DAE.

The indigenous development of membrane technology by BARC, in connection with its nuclear desalination programme, has been effectively expanded to develop and supply water purification systems to address specific contaminant issues in different parts of the country; for example, BARC developed systems are in use for purification of water of brackish origin, removal of heavy metals like iron and uranium, and removal of arsenic and fluoride. Isotopic techniques have led to a much better understanding of the recharge patterns, including of aquifers, and helped sustainable exploitation of ground water and surface water resources.

The recent launch of nuclear-powered INS Arihant bears further testimony to Indian nuclear defence capabilities. It has placed India among the very few advanced countries possessing nuclear submarine technology. This technology is being upscaled to launch Indian Pressurised Water Reactor in the near future.

Meeting the target of 63 Giga Watt of electricity from nuclear sources - both indigenous and imported - by the year 2032 would require not only considerable technological and financial resources, it would also require a considerable effort to boost our human resource. This is where the BARC School can play a key role. We need highly qualified and competent nuclear scientists and engineers, professionals in the areas of nuclear safety and security as well as a new generation of project managers. Let us not underestimate this challenge.

I wish to congratulate the officers graduating this year. However, this is also a moment for introspection. Pt. Nehru's vision was not only to employ science and technology to build a strong and prosperous India, but also to use science and technology as an agent of change. It is this thinking that should guide all of us throughout our life. There are new challenges to be faced. It is imperative that you, the young graduates, undertake public outreach measures, rigorously and systematically, to allay perceived fears and concerns about nuclear power. You have been equipped with knowledge and the nation expects of you to contribute to the societal well being at large. I am confident that each one of you will carry forward this Department's standards of excellence.

Thank you and Jai Hind.