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Statement by Dr. Srikumar Banerjee, Chairman of the Atomic Energy Commission
&
Leader of the Indian delegation



Mr. President, Distinguished delegates, Ladies and Gentlemen,

It gives me great pleasure to congratulate you, Mr President, on your election as the President of the 55th General Conference. Under your able leadership and with support from the Agency's Secretariat, we are certain that the current General Conference will be able to accomplish all the tasks before it.

I welcome the entry of Lao People's Democratic Republic, the Kingdom of Tonga and the Commonwealth of Dominica to the Membership of the IAEA. I take this opportunity to congratulate them on the occasion of their joining the IAEA family.

Mr. President,

India joins other countries in expressing its deep condolences to the Japanese people for the sufferings in their country due to the terrible twin natural disasters that have struck that country. India also takes this opportunity to convey its appreciation of the efforts of the Japanese Government and people in dealing with the consequences of this tragedy.

The IAEA Ministerial Conference on Nuclear Safety during June this year, which followed soon after the Paris Ministerial Seminar on Nuclear Safety, has reiterated the consensus that nuclear safety is a national responsibility. The unanimous adoption of the Declaration at the end of that Meeting shows the importance Member States have accorded to nuclear safety and the role of IAEA in addressing this important topic.

Mr President,



At the cost of a small digression, I may mention that against the backdrop of India's long standing association with the IAEA, the Comptroller and Auditor General (CAG) of India has presented its candidature for IAEA's External Auditor for the period 2012-13. An

independent constitutional authority, the CAG has wide experience of auditing international organizations. May I request the esteemed delegations present here for favorable consideration of the candidature of CAG of India.

Mr. President,

Nuclear energy remains an important element in India's energy mix for sustaining rapid economic growth. India remains firmly committed to its indigenous nuclear programme and is planning a major expansion of nuclear installed capacity to 20,000 MWe by 2020 and to reach about 60,000 MWe during the early 2030s. This accelerated capacity addition includes installation of large-size water cooled reactors planned under international civil nuclear cooperation. This is being pursued with full regard to safety and environment, and livelihood of the people living around the plants.

Immediately after the accident at Fukushima, Prime Minister of India had underlined that safety of nuclear power plants is a matter of highest priority for the Government while implementing the national nuclear programme. Several actions have been taken in this regard. A bill to confer statutory status to the national safety regulatory authority has been introduced in the Parliament. The results of the safety reviews that were mandated by the Government of India have been made public. Several recommendations have already been implemented and a road map is prepared for implementing the other recommendations. 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 emergency response and preparedness measures have been further strengthened in our nuclear facilities. India's National Disaster Management Authority has drawn up a holistic and integrated programme of "Management of Nuclear and Radiological Emergencies".

Mr President,

While we learn lessons from the accident and take all necessary measures to enhance emergency response to a nuclear accident, we should also be prepared to scientifically examine the substantial data now available from the accidents at

Chernobyl and Fukushima, and factor these while establishing new guidelines for intervention limits for emergency response.

As a contracting party to the Conventions establishing international framework on Nuclear Safety, Assistance, and Early Notification, India is committed to fulfill all its obligations and looks forward to participating in reviewing these for effective implementation.

Mr. President,

In pursuing India's 3-stage nuclear power programme formulated under the visionary leadership of Dr. Homi Jehangir Bhabha, we strongly believe in adopting a closed fuel cycle in order to extract the maximum energy from the limited uranium resources and to provide long-term energy security by utilization of the vast resources of thorium.

Let me now give you some of the highlights of the achievements during the last year.

The installed nuclear power capacity in the country has now reached 4780 MWe. The total number of operating reactors is 20 including three new 220 MWe PHWRs, recently connected to the electricity grid. This has elevated India to the sixth rank among nations in terms of the number of nuclear power reactors in operation. I would like to mention here that the Indian PHWRs have a very competitive capital cost and offers a very low unit energy tariff. By now the Indian nuclear power sector has registered over 345 reactor years of safe operation.

The nuclear power generation during the year recorded an increase of about 40% over the previous year, due to increased fuel availability, both indigenous and imported. In particular, the average capacity factor is more than 80%, while that of 7 reactors has exceeded 90%.

En-masse Coolant Channel Replacement and En-masse Feeder Replacement were completed in unit-2 of Narora Atomic Power Station and unit-1 of Kakrapar Atomic Power Station.

The construction work at two 1000 MWe LWRs at Kudankulam being set up in technical cooperation with the Russian Federation is nearly complete. The commissioning activities in unit-1 have reached an advanced stage and the hot run in this unit has been recently completed. The progress of unit-2 of Kudankulam nuclear power project is closely following that of the first unit.

The 500 MWe Prototype Fast Breeder Reactor (PFBR) is also at an advanced stage of construction. The reactor vault is nearing completion with all major reactor equipment in place. Welding of the Roof slab (Top shield of Reactor) with reactor main vessel has commenced. Installation of steam generator and secondary sodium pump has started.

Four indigenously designed 700 MWe Pressurised Heavy Water Reactors, two each at existing sites of Kakrapar in Gujarat and Rawabhata in Rajasthan, were launched during the last year, thus raising the number of reactors under construction to seven.

The Fast Breeder Test Reactor (FBTR) at IGCAR completed 25 years of successful operation in last October. The process for life extension of FBTR up to the year 2030 is progressing well.

The test fuel subassembly for the prototype fast breeder reactor (PFBR) was irradiated in FBTR; after seeing a peak burn up of 112 GWd/t, as against the target

burn up of 100 GWd/t, it is now undergoing post irradiation examination. A test loop called SADHANA has successfully demonstrated the natural convection in sodium to air heat exchange for



validating the decay heat removal process in PFBR. In the domain of fast reactor safety, a test facility for molten fuel coolant interaction to understand the severe accidents has been commissioned.

Detailed engineering design of advanced heavy water reactor, AHWR, has now been initiated so as to enable launching the construction of the plant during the next plan period 2012 - 2017.

India is a founder member of INPRO. We are glad to see its progress during the last decade.

India has rich experience in the entire gamut of activities related to nuclear power plants and associated fuel cycle, which places it in a position to export reactors, equipment and components, as well as services to the global nuclear energy market. We possess all technologies and infrastructure relevant to small and medium sized PHWRs of 220 MWe, 540 MWe and 700 MWe capacities, which would be a safe, proven and cost-effective option for countries with small grids planning to start their nuclear power programme. In this context, India is looking forward to exporting its proven Small and Medium Sized Reactors (SMR).

Mr. President,

India is self-sufficient with regard to heavy water, zirconium alloy components and other related materials and supplies for PHWRs. Nuclear Fuel Complex (NFC) at Hyderabad manufactures fuel assemblies for different types of reactors, such as PHWRs, boiling water reactors and fast breeder reactors.

The recently opened uranium mine in Tumalapalle has a potential to be a major uranium resource, the current assessment being over 60000 tons of reserve. The alkali leaching process indigenously developed has been adopted for processing uranium ore from this mine.

A new reprocessing plant inaugurated at Tarapur has been working satisfactorily to its design capacity.

A High Flux Research Reactor (HFRR) to be set up at the new BARC campus at Visakhapatnam is designed primarily to meet the large requirements of high specific activity radio-isotopes and to provide enhanced facilities for material testing under controlled conditions.

Mr. President,

India assigns equal emphasis to non-power applications of nuclear energy. Applications in the areas of health care, agriculture, hygienisation of municipal waste and water-desalination are making greater impact in India.

Nuclear desalination plant at Kalpakkam with a capacity of 6.3 ML per day employing the hybrid technology of multi-stage flash evaporation and reverse osmosis technique is currently the largest nuclear desalination unit in the world.

Isotope hydrology is being used more broadly to improve the understanding of climate change on water resources. In one such effort, India is among the 17 research groups who participated in an Agency coordinated research project on designing a global network of isotope monitoring in large rivers. It is a matter of great satisfaction that the theme of the Scientific Forum of this General Conference is related to application of nuclear techniques in water.

Indian health authorities attach great significance to fighting the cancer menace and several cancer care institutes have been expanding their facilities and treatment capabilities. A national cancer grid network initiative has also been launched. For example, the facilities at the Tata Memorial Centre (TMC) under the aegis of the Department of Atomic Energy, which provides services to nearly 500000 patients per year, have been expanded with a new block equipped with several sophisticated

facilities. An International Peer Review conducted in October 2010 has rated the services of TMC at par with the global standards.

The IAEA's Programme on Action for Cancer Therapy (PACT) enables the channeling of the resources and expertise to the needy and developing countries. India has been an active supporter of PACT initiative. The Bhabhatron Teletherapy machine, donated to Sri Lanka under the PACT last year, is expected to be commissioned shortly. Arrangements are underway for providing the next machine to Namibia.

In our continuing support to nuclear medicine practices in India, a new facility for production of Technetium-99m generators has been set up at the laboratories of the Board of Radiation and Isotope Technology in Navi Mumbai. In order to further enhance our self-reliance, we will set-up a new facility for production of fission-produced Molybdenum-99 in Trombay.

In view of India's large interest in electron accelerator based applications, we are developing competencies and building facilities to address several aspects of accelerator technologies.

Mr. President,

India's nuclear programme attaches high importance to R&D work and some recent achievements are as follows:

- The Advanced Heavy Water Reactor, AHWR, has been designed to address siting and safety-related issues relevant for future large-scale deployment of nuclear power in a densely populated country like ours. Its design was revisited to understand and confirm its robustness against events such as earth-quake, flooding and extended Station Black Out.
- India has taken an important step in assessing the behavior of containment under 'beyond-design-basis' accident conditions. A one to four scaled down reactor primary containment test-model of the 540 MWe PHWR, with

extensive instrumentation is being subjected to a series of tests leading up to its ultimate failure. The results are being analyzed as an International Round Robin exercise involving fifteen participants from various countries. This is one of the largest containment test facility in the world.

- More than 100 solar powered Environmental Radiation Monitors have been deployed at various locations in India covering Nuclear Power Plant sites, uranium mining sites, major metropolitan cities etc. under the Indian Environmental Radiation Monitoring Network (IERMON).

A Global Centre for Nuclear Energy Partnership, GCNEP, is being set up near New Delhi to pursue studies in the field of Advanced Nuclear Energy Systems, Nuclear Security, Radiological Safety, and Applications of Radioisotopes and Radiation technologies. MOUs are already signed with USA, Russia and will soon be signed with the IAEA. France has also expressed a desire in signing an MOU.

To mark the launch of GCNEP, a regional training course on Nuclear Security - **“Physical Protection of Nuclear Facilities against Sabotage, Assessing Vulnerabilities and Identifying Vital Areas”** is scheduled at New Delhi during 14-18 November this year.

Mr. President,

The role of nuclear power as a safe, clean and viable source to meet the energy needs, as well as to adequately address the concerns of global warming and climate change, cannot be undermined. This is all the more so for developing countries and emerging economies, which aim to provide a better quality of life for their people. As regards safety, we must recall that the world has logged over 14,000 reactor-years of nuclear electricity generation in about 30 nations, with far fewer casualties compared to any other energy generating technologies over a sustained period. This in itself testifies to the strength of nuclear technology, which must be further pursued to provide an important part of sustainable energy solution for the future.

Thank you.