International Atomic Energy Agency (IAEA)
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Statement by Dr. R. Chidambaram. Chairman. Atomic Energy Commission and Leader of the Indian delegation

Mr. President,

1. May I begin by congratulating you on behalf of my delegation and on my own behalf on your election to the Presidency of this General Conference. I am confident that under your able guidance this General Conference will successfully accomplish the tasks assigned to it. I would also like to take this opportunity to welcome the entry of Azerbaijan, Tajikistan and the Central African Republic to the membership of the International Atomic Energy Agency (IAEA).

2. I have great pleasure in reading out a message from the Prime Minister of India, Mr. Atal Bihari Vajpayee:

"We have emerged from the Millenium Summit of the United Nations with a redoubled resolve to work for balanced and sustainable socio-economic development for our people. The energy of the atom can be harnessed to further this agenda. Nuclear power provides an important and clean energy option for mitigating the energy shortfalls in the developing world. Last year, we in India commissioned two modern nuclear power reactors, built with indigenous technology and expertise. We have also succeeded in increasing the average capacity factor in our nuclear power plants to a figure of 80 %. Scientific research has uncovered beneficial applications of radioisotopes and radiation in agriculture, medicine and industry.

Together with ensuring safety and monitoring safeguards, we believe that the IAEA has an important role in promoting technological capabilities among its member states for these developmental goals. As a founder member of the Agency, India would extend its fullest support to these end endeavors.

I take this opportunity to wish the $_{44}$th General Conference of the IAEA all success in its deliberations."

3. This year the Director General submitted to the Board the Agency's Medium Term Strategy (MTS), envisaged to form the basis for the formulation of programme proposals in the years 2001-2005. In this regard, I would like to emphasize that the IAEA was created with the main objective of accelerating and enlarging the contribution of atomic energy to peace, health and prosperity throughout the world. This is the central pillar on which the Agency should rest while giving due consideration to safeguards measures to prevent the use of Agency assistance for military proposes,

and establish safety standards for protection of health and minimization of danger to life and property. Safety and safeguards are indeed important and necessary *supporting* activities to enlarging and accelerating the contribution of nuclear energy for peaceful purposes. However, they cannot become activities of the IAEA overshadowing the peaceful uses of atomic energy. Primacy must be accorded to technology. This is the only way we can faithfully interpret the time-tested Statute of the Agency.

4. Our delegation supports the priority assigned to the potential role of nuclear energy in sustainable development in the Medium Term Strategy which is in line with the recommendations of the Scientific Forum held during the last General Conference. In this regard, we would like to reiterate that IAEA with its comprehensive in-house expertise, as well as its access to globally available expertise, would do well to pool all resources to facilitate the role of nuclear energy in sustainable development. This is the need of the hour and the Agency programme should include the Role of innovative Nuclear Reactors and Fuel Cycles for Sustainable Development. We appreciate the Director General's efforts in trying to establish a Task Force for this purpose. We feel strongly that it will be worthwhile for the Agency to support this programme as part of the regular programme of the Agency.

5. In the context of sustainability of nuclear power, it is appropriate for the Agency to address the issue of various nuclear fuel cycle options. A discussion by experts on the merits and problems of the closed-fuel cycle versus the open-fuel cycle with its associated technical, financial and environmental aspects could form a meaningful part of the Medium Term Strategy. Recognizing the importance of the role of nuclear energy especially in developing countries, India, along with Group 77 and China, has been requesting a 'Nuclear Technology Review' on the lines of the nuclear safety review and to discuss it as part of the dedicated agenda in the Board and in the General Conference. We are happy that the Director General has heeded to our request and has also appointed Standing Advisory Groups for Nuclear Energy and Nuclear Science and Applications.

6. Mr. President: Even in countries which are currently seeing a slowdown in their nuclear power development programme it is likely that a reversal would occur due to two factors - firstly, due to a substantial increase in oil prices as is happening now and, secondly, due to their commitment to the Kyoto Protocol. For a large country like India, with its need to increase its per capita electricity consumption substantially, rapid growth in nuclear electricity generation capacity is of vital importance.

7. In India, our strong policy emphasis on nuclear power is on the operation of nuclear power plants in a safe and reliable manner. It is a matter of satisfaction that the second unit of Rajasthan Atomic Power Station, where coolant channel replacement and upgradation works were successfully completed in 1998 based on indigenous technology and tools has been operating exceedingly well since then. During the last GC we had announced the commissioning of an indigenously designed and built 220 MW(e) Pressunsed Heavy Water Reactor (PHWR) at Kaiga. Since then another PHWR has gone commercial at Rajasthan. Two more units of 220 MW (e) are expected to reach criticality soon. Construction work on the two indigenously designed 500 MW(e) PHWR units at Tarapur is in full swing. The preparation of the Detailed Project Report (DPR) for the construction of two 1000 MW (e) VVERs at Kudankulam in technical cooperation with Russia began in April 1999 and is expected to be completed next year. Site related activities have already commenced.

8. Necessitated by our limited uranium resources and in order to ensure long term energy security India has opted for a closed nuclear fuel cycle policy, involving a fast breeder reactor programme and thorium utilization and associated fuel reprocessing and refabrication plants. The capabilities for providing the technology resources for our programme have been mainly derived from our strong R & D programme. In the 15-year old Fast Breeder Test Reactor (FBTR) at Kalpakkam, the performance of the unique and indigenously developed mixed Uranium-Plutonium Carbide fuel has been extremely good and so far it has reached a maximum bum-up of 53,830 MWd/t without any fuel failure. Preparations for the commencement of construction of a 500 Mwe Prototype Fast Breeder Reactor (PFBR) are underway. The U_{233} fuelled Kamini research reactor is also being operated successfully. A closed fuel cycle is also important for the safe management of the environment as it brings down the quantity of high level wastes to very low levels.

9. At the Bhabha Atomic Research Centre (BARe), there is a strong emphasis on activities related to the design and development of the Advanced Heavy Water Reactor (AHWR), using plutonium and U_{233}. The reactor will have several advanced safety features, such as passive safety systems not requiring either external power or operator action for activation. Experimental programmes to validate the computer codes used for the design of the natural circulation based coolant system of the AHWR are now well underway. India's efforts in developing the AHWR, which will facilitate thorium utilization, is an effort toward developing innovative reactor and fuel cycle designs for sustainable development of nuclear energy. The growth in installed power

generation capacity will, of course, continue with plants of state-of-the-art designs of thermal and fast reactors with emphasis on improved safety. In this context, we appreciate the initiative of President Putin announced in the recent UN Millenium Summit where he has recognised that the most rapid energy production growth will take place in the next century in the developing countries. He has also said that to diminish ecological degradation caused by greenhouse gases and to save global fossil reserves for non-energy uses by the present and future generations there is the need to develop new nuclear technologies which are also proliferation resistant. As already mentioned by me earlier, IAFA with its comprehensive membership covering almost the entire world and, more importantly, the developing Member States, has the collective responsibility to find technological solutions to such problems. India on its part, as always, strongly supports these efforts and will actively participate in such initiatives.

10. We are also pursuing R&D in non-grid based electricity applications of nuclear energy such as desalination, process heat generation, production of non-fossil fuels and compact portable power packs. Since 1995, MOX fuel designed at BARC has been introduced in a limited fashion in the Boiling Water Reactors (BWRs) at Tarapur. The fuel has performed well and the discharged assemblies will now undergo post-irradiation examination. This programme is a forerunner to the introduction of MOX in a bigger way for the utilization of Pu in thermal reactors in addition to the programme of using Pu in fast reactors. This experience in plutonium recycle is also of importance in the context of our long term interest in thorium which, incidentally, is also an excellent host for deep burning of fissile materials as compared to other alternatives and offers excellent characteristics needed for addressing issues related to large-scale deployment of nuclear power globally.

11. The power programme has been matched by good performance from its support base. The Nuclear Fuel Complex (NFC) has exceeded its target for the production of fuel and structural components for 1999-2000, while reducing the energy consumption per kilogramme of fuel fabrication. A few weeks back it reached a major milestone by manufacturing the 2,00,000th bundle of PHWR fuel. The Heavy Water Board, by streamlining its manufacturing processes, ensured lower production costs while enhancing quality and productivity at the same time. The Electronics Corporation of India (ECIL) successfully tested and supplied microprocessor based safety related systems for nuclear power plants at Kaiga and Rajasthan and installed successfully a man-machine interface (MMI) application package in the control instrumentation at Narora and Kakrapar.

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12. From the point of view of safety also the last year has been excellent. A peer review was successfully performed early this year by the World Association of Nuclear Operators (WANO) at the nuclear power plant at Narora, one of our older indigenously designed plants. The Y2K roll-over occurred smoothly in India. As one of the 11 critical sectors identified by the Government, India had taken, in advance, all precautionary measures in the atomic energy sector. The Atomic Energy Regulatory Board (AERB) monitored all the activities in this regard. Progress has also been made in initiating safety related research projects at the Safety Research Institute of AERB.

13. Our R&D programme has continued to lay emphasis in areas such as medicine, agriculture and industry. Tracer technology has been used successfully to detect leaks in petrochemical industries. A commercial facility for irradiation of spices up to 12,000 tonnes/year was commissioned early this year near Mumbai. A POTON irradiator, a demonstration plant for irradiation of 10 tonnes/hour of potatoes and onions is nearing completion. The Board for Radiation and Isotope Technology (BRIT) has developed and exported gamma chambers against orders received from the IAEA. It recently exported 50,000 curies of Cobalt-60 source along with irradiation flask and conveyor system to Bangladesh. Based on its R&D, the implantation of biocompatible metallic stents, coated with ^{32}P, to help patients who have undergone angioplasty has been undertaken successfully. Some work in these areas has also been taken up under the aegis of the Regional Cooperation Agreement (RCA) programme for Asia and the Pacific. As a founder member of the RCA, India is a strong supporter of the programme and has hosted several events including the meeting of the RCA national coordinators meeting early this year.

14. India continues to invest in fundamental research. For example, at the Institute for Plasma Research (IPR), work on the indigenous fabrication of the superconducting steady state tokamak SST 1 is in full swing and the commissioning of the tokamak is expected by end 2002. We would be happy to participate, on the basis of our experience, in international efforts towards development of fusion power.

15. As regards Agency activities, a unique feature was the organisation of an Industrial Forum in January this year. It is very important that we harmonize and focus the promotional efforts being made by the private sector, governments, and intergovernmental and international organisations in the field of nuclear power. Measures taken in this direction will have a catalytic effect in boosting and reinforcing the efforts by each body individually, in its own right, for the common good.

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16. Under the auspices of IAEA, several mechanisms currently exist for facilitating information exchange and co-operative R & D activities, among interested Member States, in areas relating to peaceful applications of nuclear energy. It has often been felt that the existing mechanisms have some limitations, particularly those linked to inadequate funding, which restrain a desirable expansion in the reach, range and volume of such programmes. This is evident from the fact that several recommendations made in various IAEA symposia, AGMs, Consultants' Meetings etc., cannot be expeditiously followed

17. While participating in the Industrial Forum, I had suggested a new mechanism for international co-operation termed "Innovative Technology Development Nucleation Programme" (ITDNP). In my opinion, the new mechanism, if adopted, could be of great benefit both to the Agency and the concerned Member States interested in coming together to pursue joint R & D programmes without imposing any significant financial burden on the Agency.

18. The Agency had placed before the Board of Governors a draft Memorandum of Understanding (MoU) between the IAEA and the OECD/NEA this year. The senior Experts Group, of which I was a member, did speak of enhancing synergies in the field of nuclear energy. But I wish to stress that synergies can be strengthened only in an atmosphere of transparency. We sought clarifications in the draft which would eliminate any chance of adverse discrimination to Non-OECD members of IAEA through application of the MoU, in particular the need to examine how the confidentiality clause of the NEA impacts on information available to non-OECD members. It is important that any such confidentiality clause should not cause non-OECD members to be denied a part or all of the information relating to an item of co-operation under consideration. Our worry was that whatever co-operation was carried out under the auspices of the MoU should not be considered by the NEA to be confidential. Moreover, the purpose of the co-operation is lost when we are merely presented the results of the activities, without being privy to the scientific and technological effort by which the results were arrived at. In any joint venture of this nature, each party shares its expertise and co-operates to achieve the common goal. Therefore, one can understand this MoU addressing specific activities pertaining to areas of common interest and co-operation but not single Agency activities. Each Agency is responsible for its own activities in accordance with its statutory functions. In our opinion, therefore, this MoU should avoid mentioning "single Agency Activities".

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19. India has consistently supported the Technical Cooperation activities of the Agency. As in the past India is pleased to pledge in full its share for the Technical Cooperation Fund 2001 and payment will be made on time as always. In addition, we are assisting, through expertise and equipment, two 'footnote-a' projects in Sri Lanka and have also offered our partnership in the establishment of a nuclear programme in that country. Regarding the funding of technical cooperation activities, we have participated in the consultations with CoChairpersons, the Ambassadors of Finland and Mexico. India played a key role in assisting the previous Chairman, the Ambassador of Netherlands, in arriving at the Indicative Planning Figure (IPF) in 1998. At that point we had explored with the Ambassador of the Netherlands the possibility of including the TC Fund as a part of the regular budget to make the resources for the TC Fund predictable, assured and adequate. However, no conclusive decision could be arrived at on this difficult issue. Regarding the assessed programme costs, we have always been of the view that without any exception, recipient States should pay at least the minimum assessed programme costs for it is only a fraction of the benefit that accrues to them.

20. We would like to underscore that the prime issue was that all Member States should pledge and pay in full, especially the major donor countries. Instead, we see a widening gap between pledges and actual contributions. We on our part always pledge in full and pay in time. Although the contribution to the TC has been regarded as voluntary, it is based on the Resolution passed by the General Conference of the IAEA. To this extent, TC Funding should be regarded as morally obligatory if not mandatory. There is the need for the Agency to orient its TC programmes in such a way as to promote self-reliance among developing countries rather than reliance on developed countries. We had called on the Agency to identify centres of excellence for human resources development under the Technical Cooperation for Developing Countries (TCDC) programme and had offered our training facilities to scientists and engineers from developing countries. In this regard, in a signal event this year the DAE signed a Memorandum of Understanding (MoU) with the IAEA for cooperation in connection with the Agency's regional and interregional training events, individual and group fellowships training programmes carried out as part of the Technical Cooperation activities of the IAEA. The MoU is an important milestone in our relationship with the IAEA and formalises our longstanding offer to make the Bhabha Atomic Research Centre (BARC) a "centre of excellence/Regional Resource Unit (RRU)" under the Agency's Technical Cooperation for Developing Countries (TCDC) programme.

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21. The Safeguards Department has indicated that new measures such as remote monitoring and satellite transmission under the Model Additional Protocol are not expected to reduce costs. Indeed, costs are likely to go up, at least in the short term, as a result of more countries adhering to the Model Additional Protocol and the increased verification demands. The "bulge" in safeguards expenditures was expected to ease off and later reduce once the integrated safeguards system along with the Additional Protocol was implemented by the Agency. However, the Safeguards Department has indicated now that actual efficiencies and streamlining of safeguards following the implementation of integrated safeguards needed to be studied to determine the future trends and there is no certainty of any reduction in costs; on the contrary, costs are likely to increase.

22. There is need to see an improvement in quality in the implementation of safeguards. We need to examine whether the present system of safeguards is the best that we can devise. Much has changed in technology since 1971 when the new inspection regime was put in place. This should be reflected in the quality and quantity of inspection effort, with corresponding reductions in cost. The argument that increases in safeguards need to be accommodated automatically because these are mandatory requirements under agreements as required under the NPT brings into question the differences between statutory activities and mandatory activities. With promotion being the prime statutory aim of the IAEA, we wonder why only 5.9% of the budget goes for an important activity like nuclear power. On the other hand, there seems to be no holding back of resources for safeguards activities, with a call now for the extra-budgetary contribution also to be incorporated into the regular budget. Such actions would further hurt promotional activities.

23. We reiterate our appreciation of the Agency's efforts in preventing illicit trafficking in nuclear materials. Yet, in our neighbourhood, clandestine acquisition of sensitive technology and materials is known to have occurred. Preventing this requires the commitment of Member States of the Agency. Both on the issue of physical protection measures and export controls, India follows a stringent law based system which is borne out by its exemplary record.

24. The stockpiles of weapons of mass destruction, in the custody of those who were the first to build up such deadly arsenals, remain at alarmingly high levels. Our own policy is based on responsibility and restraint and we continue to press with undiminished commitment for universal, verifiable nuclear disarmament, even while safeguarding our strategic space and autonomy in decision-making. International peace cannot be divorced from the need for equal and legitimate security for all.

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25. Scientifically speaking, we move into the new millennium in 2001. The new century must cause us to pause, to rethink our strategies, and to examine our options. We need a fresh look at the importance of nuclear power. We need to shake off the fetters of prejudices and apprehensions that have led to public fears of this very important, indeed crucial technology. The concerns about nuclear power stem primarily from fears about safety of reactors, and concerns over management of long-lived radioactive wastes. These worries are exaggerated, since technological solutions are available for addressing both these issues. Let us pool our collective wisdom and scientific knowledge and work together to address the challenges of global development through deployment of nuclear technologies overcoming the barriers that come in the way.

Thank you, Mr. President.