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PLAN FOR PRODUCING POTABLE WATER ECONOMICALLY

1. Since 1989, the General Conference has adopted a series of resolutions on a plan for producing potable water economically [i.e. resolutions GC(XXXIII)/RES/515, GC(XXXIV)/RES/540, GC(XXXV)/RES/563 and GC(XXXVI)/RES/592]. Following the adoption of these resolutions, the Agency initiated some activities which were partly financed by the regular budget and partly through extrabudgetary resources. The main results achieved to date from these activities were the publications of two technical documents in September 1990 as IAEA-TECDOC-574 entitled "Use of nuclear reactors for seawater desalination" and IAEA-TECDOC-666 entitled "Technical and economic evaluation of potable water production through desalination of seawater by using nuclear energy and other means" issued in September 1992, respectively.
2. TECDOC-574 provides a state-of-the-art review of sea-water desalination technologies, experience and studies on coupling of nuclear reactors with desalination processes and institutional issues related to desalination by using nuclear energy. The main conclusions of TECDOC-666 are that the use of nuclear energy as an alternative to fossil-fuelled plants to supply energy for sea-water desalination is technically feasible and is in general economically competitive for medium to large-size units integrated into the electricity grid system, and that large electricity-generating nuclear power plants which are integrated into the electricity supply grid system and which supply electricity to separately located desalination plants using the reverse osmosis process offer the most cost-advantageous option.
3. In September last year, in resolution GC(XXXVI)/RES/592, the General Conference requested the Director General to "convey to the relevant organizations of the United Nations family and to other relevant international organizations the main conclusions of the technical and economic evaluation of potable water production through desalination of seawater by using nuclear energy or other means"; called "upon Member States in a position to provide

expert services and extrabudgetary resources in support of the activities relating to seawater desalination using nuclear energy which are foreseen in the Agency programme for 1993-94 to make such services and resources available" (part of the activities in the 1993-94 programme were subject to the availability of extrabudgetary resources); decided "to include in the agenda for the thirty-seventh regular session an item entitled " Plan for producing potable water economically", and requested "the Director General to submit to the Conference at that session a document on which discussion can be based".

4. In compliance with the requests contained in the resolution, the Secretariat distributed the above mentioned IAEA-TECDOCs not only to relevant United Nations and international organizations, but also to potentially interested countries and a number of individuals. Owing to the high level of interest by Arab Member States, TECDOC-666 has been translated into Arabic and will be issued shortly.

5. The Secretariat contacted a number of Member States and drew their attention to the resolution GC(XXXVI)/RES/592 in which Member States were called upon to provide expert services and extra-budgetary resources. Out of the countries contacted, 10 replies have so far been received of which 5 are positive. The Socialist People's Libyan Arab Jamahiriya has made available AS 600 000 for 1993, and the services of two cost-free experts; the People's Republic of China has offered the services of one cost-free expert, Egypt and India have offered partly cost-free experts, and the Philippines might have means available in 1994. In addition, the OPEC Fund, the Arab Atomic Energy Authority and the African Development Bank have been approached. The OPEC Fund has indicated that the kind of assistance requested was not within the scope of its activities and the Arab Atomic Energy Authority has offered co-operation and is prepared to sponsor a portion of an Advisory Group Meeting to be held in Cairo. No reply has as yet been received from the African Development Bank.

6. The Secretariat has continued its work on other aspects of this question. As requested in resolution GC(XXXIV)/RES/540, the Secretariat established contacts with several United Nations agencies (FAO, WHO, UNESCO and WMO) and approached in addition the five United Nations Regional Commissions (ECA, ECE, ECLAC, ESCAP and ESCWA), and suggested co-operation in the area of information exchange concerning freshwater requirements and water resources in different countries and regions. It turned out that no consistent data on freshwater and water resources in different countries exists. A global study on water needs is desirable, however, it would be too time-consuming and would require a considerable amount of funding. It is also felt that it is beyond the scope of the

IAEA's activities to perform such a global study which would more properly be the responsibility of other United Nations organizations. Perhaps it could be undertaken in the context of Chapter 18 of the UNCED Agenda 21. Therefore, the Secretariat proposes at this stage to perform a limited study for selected subregions of the world where a greater urgency for drinking water exists. Subregions derived from Technical Co-operation projects supplementing the study (e.g. North Africa and Saudi Arabia) could be used as an example for demonstration purposes. Discussions with representatives of the United Nations regional commissions and experts from the North African countries and Saudi Arabia will be held in Vienna in autumn 1993, as mutually agreed, to review the available information on water resources and needs in these subregions, and to discuss ways in which more consistent and homogeneous data could be gathered in other subregions such as the whole Arabian Peninsula, North China, South-east Asia and Mexico.

7. Following the economic assessment reported in TECDOC-666, the Secretariat focusses its attention now on coupling aspects of nuclear reactors with desalination processes as indicated in its 1993 programme of work. In addition, it addresses two subactivities through extrabudgetary resources. The first consists in scrutinizing and complementing the data collected on the use of small and medium-sized reactors for seawater desalination which are presented in TECDOC-666. A status report on small and medium-sized reactors is under preparation. The second consists in gathering and reviewing information on possible local participation in seawater desalination by using nuclear energy.

8. With a view to establishing a programme for 1995/96, an Advisory Group Meeting (AGM) reviewed possible activities which had been proposed at several earlier meetings relating to the economic assessment, and established priorities. These include:

1. Coupling of nuclear power reactors with desalination processes
2. Coupling of nuclear heating reactors with distillation processes
3. Technical report on required steps for seawater desalination by using nuclear energy
4. Needs for seawater desalination
5. Conditions of (very) small reactors
6. Financing aspects
7. Floating plants
8. Framework for a demonstration and training plant

Given budgetary constraints, it is expected that the performance of these activities would largely depend on availability of extrabudgetary resources.

9. In the framework of the Technical Co-operation part of the plan for producing potable water economically, i.e. the regional feasibility study on seawater desalination by using nuclear energy for North African countries, further necessary data and information have been gathered in a regional meeting and a workplan has been produced for 1993. This workplan mainly comprises expert missions to North African countries in order to assist these countries with the performance of the study and the preparation of a report. It is envisaged that the feasibility study will be completed by the end of 1994.

10. Also, Saudi Arabia has requested technical assistance for the performance of a similar feasibility study. The progress made in the North African regional project can be used as a guideline for this project which should also be complete by the end of 1994.