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'ISRAELI NUCLEAR ARMAMENT

Report of the Secretary-General

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I. INTRODUCTION

1. By resolution 41/93 of 4 December 1986, the General Assembly, *inter alia*, requested the Secretary-General to follow closely Israeli nuclear activities in the light of the latest available information, and to update the Study on Israeli Nuclear Armament 1/ **•** ukanit it to the General Assembly at its forty-second session.

2. The study entitled "Israeli nuclear armament" was prepared, in pursuance of resolution 34/89 of 11 December 1979, by the Secretary-General, with the assistance of qualified experts, and was submitted to the Assembly at its thirty-sixth session in 1981. It contained factual information, analyses and assessments covering the period up to June 1981 and arrived at conclusions, among which are the following:

"In carrying out its mandate to study the question of Israeli nuclear armament, the Group of Experts has sought to make its evaluation as factual and concise as possible on the basis of available information. However, because of gaps in the availability of reliable information, some of the specific assessments may be subject to an element of Uncertainty.

"...

"Thus, there is no doubt that Israel has the technical capability to manufacture nuclear weapons and possesses the means of delivery of such weapons to targets in the area. To recapitulate Israel has an unsafeguarded reactor capable of producing considerable amounts of plutonium and has some means of separating plutonium from irradiated uranium fuel. It has the technological skills and expertise as well as the technical infrastructure required to manufacture nuclear weapons. Since the greater part of Israel's nuclear programme is not under safeguard, and since few technical details about that programme have been made publicly available, it is difficult to assess the full extent of Israel's actual nuclear activity. However, since 1964, when Dimona went into operation, Israel could have produced sufficient weapons-grade plutonium for a significant number of explosive devices.

"Israel's official statements on its plans and intentions with regard to the possession of nuclear weapons have often been equivocal and have provided little definitive information. It has repeatedly utilized the formula that 'Israel will not be the first to introduce nuclear weapons into the Middle East'. At the same time, however, Israel has refused to sign and ratify the Treaty on the Non-Proliferation of Nuclear Weapons or otherwise to place all of its nuclear facilities under international safeguard. Israel has not only failed to submit all its own nuclear facilities to international inspection, but has also appeared to undermine the credibility of IAEA safeguards in the region, in particular by the bombing of an Iraqi nuclear reactor, which was under IAEA safeguards.

"Meanwhile, there have been official and unofficial statements and reports in a number of countries that Israel has already crossed the

nuclear-weapon threshold. Discussion of these issues must take account of the political, military and geographic circumstances of the region. Whereas Israel could be moved by a number of cogent arguments to refrain from the acquisition of nuclear weapons, various considerations may be thought to prompt it to acquire nuclear weapons. In fact, Israel appears to have a posture of deliberate ambiguity on this subject, which has contributed considerably to the alarm in the region and to the concern of the world community.

"The Group of Experts believes that this deliberate ambiguity is or may be a factor contributing to instability in the region and could be an obstacle to the creation of the confidence necessary to achieve a political settlement there.

"On the basis of the available authoritative information, the Group of Experts is unable to conclude definitively whether or not Israel is at present in the possession of nuclear weapons. There are, however, significant indications that Israel reached the threshold of becoming a nuclear-weapon State at least a decade ago. Taking into account its nuclear facilities, the availability of nuclear material required for their operation, the existence of scientific and technical knowledge and the presence of an adequate number of trained and experienced staff, the Group of Experts wishes to emphasize that they do not doubt that Israel, if it has not already crossed that threshold, has the capability to manufacture nuclear weapons within a very short time."

3. By resolution 39/147 of 17 December 1984, the General Assembly, inter alia, requested the United Nations Institute for Disarmament Research in co-operation with the Department for Disarmament Affairs of the Secretariat and in consultation with the League of Arab States (LAS) and the Organization of African Unity (OAU), to prepare a report providing data and other relevant information relating to Israeli nuclear armament and further nuclear developments. That report was submitted to the Assembly at its fortieth session in 1985 (A/40/520, annex). It provided data and other information relating to Israeli nuclear armament and further nuclear developments, taking into account reports of the Secretary-General on the matter as well as information on the subject provided by the International Atomic Energy Agency (IAEA). The main findings of the report were summarized as follows:

"The material contained in the present report confirms the assessment and conclusions of the Secretary-General's report on Israeli nuclear armament (A/36/431) . . .

"Israel has not acceded to requests from the Security Council and the General Assembly of the United Nations to place all its nuclear activities under international safeguards. It is to be stressed that most of the information relating to Israel's nuclear activities is kept secret, and thus the quantity and quality of available reliable information on the subject is such that it is difficult to draw definitive conclusions."

4. The present report is submitted to the General Assembly in pursuance of resolution 41/93. In fulfilling his mandate, the Secretary-General, in a note verbale dated 27 April 1987, drew the attention of all Member States to paragraph 7 of the resolution and stated that, in the context of the request contained in that paragraph, he would be grateful for any specific information directly relevant to updating the 1981 report that they might be able to provide. Replies to the note verbale were received from the Governments of Bangladesh, Iraq and Israel. The Secretary-General also stated in letters sent to IAEA, LAS and OAU, dated 5 May 1987, that he would appreciate receiving any relevant information that those organizations might wish to provide on the matter. A reply was received from IAEA.

5. In the preparation of the present report, the Secretary-General has used, in addition to the replies received by him, publicly available information covering the period since the 1981 study.

II. UNITED NATIONS CONCERN WITH QUESTIONS OF ISRAELI NUCLEAR ARMAMENT AND RELATED MATTERS

A. General Assembly resolutions on the questions of Israeli nuclear armament and the establishment of a nuclear-weapon-free zone in the region of the Middle East

6. At its thirty-sixth session, after considering the report of the Secretary-General on Israeli nuclear armament (A/36/431), the General Assembly adopted resolution 36/98 of 9 December 1981, by which it, *inter alia*, expressed its deep alarm at the fact that the report had established that Israel had the technical capability to manufacture nuclear weapons and possessed the means of delivery of such weapons; requested the Security Council to prohibit all forms of co-operation with Israel in the nuclear field; called upon all States and other parties and institutions to terminate forthwith all nuclear collaboration with Israel; requested the Security Council to institute effective enforcement action against Israel so as to prevent it from endangering international peace and security by its nuclear-weapon capability; demanded that Israel should renounce, without delay, any possession of nuclear weapons and place all its nuclear activities under international safeguards; and requested the Secretary-General to follow closely Israeli military nuclear activity and to report thereon as appropriate.

7. Since 1981, the General Assembly has adopted a number of resolutions, in addition to resolution 36/98, reflecting its uneasiness about the possible danger of the proliferation of nuclear weapons in the Middle East. The resolutions adopted between 1981 and 1984 are summarized in the 1985 report (see A/40/520, annex, paras. 10, 13, 14, 16 and 18-20). 2/

8. At its fortieth session, the General Assembly adopted resolution 40/93 of 12 December 1985 entitled "Israeli nuclear armament", by which it, *inter alia*, took note of the above-mentioned 1985 report (A/40/520, annex, see para. 3); reiterated its condemnation of Israel's refusal to renounce any possession of nuclear weapons; requested once more the Security Council to take urgent and effective measures to

ensure that Israel complies with Security Council resolution 407 (1981) and places all its nuclear facilities under IAEA safeguards; reiterated its request to the Security Council to investigate Israel's nuclear activities and the collaboration of other States, parties and institutions in these activities; called upon all States and organizations that had not yet done so to discontinue co-operating with and giving assistance to Israel in the nuclear field; and requested the Secretary-General to follow closely Israeli nuclear activities and to report thereon as appropriate to the Assembly.

9. At the same session, the General Assembly also adopted resolution 40/82 of 12 December 1985 entitled "Establishment of a nuclear-weapon-free zone in the region of the Middle East", by which it, inter alia, urged all parties directly concerned to consider seriously taking the practical and urgent steps required for the implementation of the proposal to establish such a zone; invited those countries, pending the establishment of the zone, not to develop, produce, test or otherwise acquire nuclear weapons or permit the stationing on their territories, or territories under their control, of nuclear weapons or nuclear explosive devices; and took note of the report of the Secretary-General containing the views of parties concerned regarding the establishment of a nuclear-weapon-free zone in the region of the Middle East (A/40/442 and Add.1).

10. At its forty-first session, the General Assembly adopted, under the agenda item "Israeli nuclear armament", resolution 41/93 of 4 December 1986, by which it, inter alia, reiterated some of the views contained in resolution 40/93, including its condemnation of Israel's refusal to renounce any possession of nuclear weapons; in addition, it reiterated its request to IAEA to suspend any scientific co-operation with Israel that could contribute to its nuclear capabilities⁷ and requested the Secretary-General to submit an updated report on Israeli nuclear activities (see para. 1) to the Assembly at its forty-second session.

11. At the same session, the General Assembly also adopted resolution 41/48 of 3 December 1986 entitled "Establishment of a nuclear-weapon-free zone in the Middle East", by which it, inter alia, again urged all parties directly concerned to consider seriously taking the practical and urgent steps required for the implementation of the proposal to establish a nuclear-weapon-free zone in the region of the Middle East in accordance with the relevant resolutions of the General Assembly and, as a means of promoting this objective, invited the countries concerned to adhere to the Treaty on the Non-Proliferation of Nuclear Weapons; and called upon all countries of the region that had not done so, pending the establishment of the zone, to agree to place all their nuclear activities under IAEA safeguards.

12. In this connection, it is to be noted that the General Assembly has repeatedly expressed its concern at the increasing collaboration between South Africa and Israel, especially in the military and nuclear fields, and has condemned this collaboration. 3/

13. For its part, Israel has frequently reaffirmed its proposal submitted originally at the thirty-fifth session of the General Assembly, in 1980 (A/C.1/35/L.8), calling upon all States of the Middle East and non-nuclear-weapon

States adjacent to the region to convene at the earliest possible date a conference with a view to negotiating a multilateral treaty establishing a nuclear-weapon-free zone in the Middle East. Since the same session, Israel has each year joined the consensus on resolutions concerning the establishment of a nuclear-weapon-free zone in the Middle East.

B. Osirak

14. On 7 June 1981, Israel attacked the Iraqi Osirak research reactor at the nuclear research centre near Baghdad. The attack was immediately considered by the Board of Governors of IAEA and by the Security Council, which adopted resolution 487 (1981) on 19 June 1981. By it, the Security Council, inter alia, strongly condemned the military attack by Israel as being in clear violation of the Charter of the United Nations and the norms of international conduct) called upon Israel to refrain in the future from any such acts or threats thereof) and called upon Israel urgently to place its nuclear facilities under the safeguards of IAEA.

15. Since 1981, the General Assembly has each year adopted a resolution under the agenda item "Armed Israeli aggression against the Iraqi nuclear installations and its grave consequences for the established international system concerning the peaceful uses of nuclear energy, the non-proliferation of nuclear weapons and international peace and security". 4/ In 1983, at its thirty-eighth session, the General Assembly considered a report by the Secretary-General entitled "Study on the consequences of the Israeli armed attack against the Iraqi nuclear installations devoted to peaceful purposes" (A/38/337) (see also A/40/520, annex, para. 15) .

C. IAEA consideration

16. In 1981, the General Conference of IAEA adopted resolution GC(XXV)/RES/381, by which it demanded the suspension of Israel from the exercise of privileges and rights of membership during the 1982 General Conference, if Israel by that time had not complied with Security Council resolution 487 (1981). It also decided to suspend immediately the provision of any technical assistance to Israel.

17. In 1983, the General Conference of IAEA adopted resolution GC(XXVI I) /RES/409, by which it, among other things, decided to withhold research contracts from Israel if, by the time of the 1984 General Conference, Israel had not withdrawn its threat to attack nuclear facilities.

18. In 1984, the General Conference of IAEA adopted resolution GC(XXVII I)/RES/425, in which it considered that Israel did not fulfil the provisions of resolution GC(XXVI I)/RES/409 and requested the Director General of the Agency to seek Israel's assurance personally not to carry out such attacks.

19. In 1984, at the General Conference of IAEA, Israel stated its policy that peaceful nuclear facilities should be inviolable from military attacks. This policy statement was reaffirmed at the General Conference in 1985 and in a letter sent to the Director General on 23 September 1985.

20. In 1985, the General Conference of IAEA adopted resolution GC(XXIX)/RES/443, which considered that Israel's letter of 23 September 1985 satisfied the requirements of resolution GC(XXVIII)/RES/125.

21. On 25 September 1987, the General Conference of IAEA adopted resolution GC(XXXI)/RES/470 on Israel's nuclear capabilities and threat, by which it demanded that Israel place all its nuclear facilities under IAEA safeguards in compliance with Security Council resolution 487 (1981); requested the Director General of IAEA to consider implementation by the Agency of provisions in General Assembly resolutions 41/12 of 29 October 1986 and 41/93 relating to IAEA; and requested him to report to the Board of Governors of IAEA and the next session of the General Conference on Israeli nuclear Capabilities and threat.

III. VIEWS OF MEMBER STATES

22. In response to the Secretary-General's note verbale of 27 April 1987, Bangladesh stated that it was concerned at what it saw as continuing Israeli efforts to build a nuclear bomb, giving the arms race in the region a new dimension. It also held that the international community needed to intensify its pressure on Israel to open its nuclear facilities for inspection by IAEA.

23. Iraq noted that the United Nations and international organizations concerned with atomic energy had issued resolutions and studies concerning Israeli nuclear armament and the danger thereof. It stated that the two United Nations studies (A/36/431 and A/40/520) had shown that Israel possessed the technical and scientific capability to manufacture and produce nuclear weapons at least by the end of the decade. Iraq declared that, among the many proofs and evidence to that effect, it had been revealed that Israel had continued systematically to build up its nuclear arsenal. In support of its view, Iraq referred to assessments given by specialized institutions and well-known international figures, such as James Akins, a former United States Ambassador to Saudi Arabia; Paul Warnke, a former Deputy Secretary of State of the United States; and Richard Sale and Anthony Cordesman, weapons experts of the United States. Iraq also referred to the assessment given by Theodore Taylor, a former head of the nuclear test programme of the United States Department of Defense, of the information published by the London Sunday Times on 5 October 1986 (see para. 25), that "there should no longer be any doubt that Israel is, and for at least a decade has been, a fully-fledged nuclear weapons State".

24. Israel noted that it had voted against resolution 41/93, the operative paragraphs of which bore witness to a tendency of singling out Israel. It reaffirmed (a) its often-expressed support for the principle of non-proliferation of nuclear weapons; and (b) its support for the establishment of a nuclear-weapon-free zone in the Middle East as communicated to the Secretary-General and reproduced in its letter dated 13 June 1985 (A/40/383) and in document A/41/465. It further declared that it stood by its declaration that Israel would not be the first country to introduce nuclear weapons into the Middle East. In addition, Israel noted that it had never made reference to its scientific and technical competence in the nuclear field, other than to offer technical assistance or co-operation in the peaceful uses of nuclear energy.

25. Separately, the Syrian Arab Republic, on behalf of the Group of Arab States, addressed a letter dated 29 July 1987 to the Secretary-General of the United Nations, with an annex entitled "Information on the subject of Israeli nuclear armament" (A/42/434). It expressed the view that, since the issuance of the 1981 study, Israel had continued its nuclear activities in a way that had increased the concern of the international community. It noted that Israel still refused to adhere to the Treaty on the Non-Proliferation of Nuclear Weapons and still refused to place its nuclear facilities under IAEA safeguards. It further dealt with some specific aspects of the question in the light of information that had recently become available (see A/42/434, annex) and concluded that Israel possessed nuclear weapons and that it was still seeking to develop such weapons quantitatively and qualitatively. The view was expressed that the matter required the United Nations, and specifically the major Powers, to take the necessary steps to remove the Israeli nuclear danger and guarantee the peace and security of the States of the region.

IV. NATURE OF INFORMATION ON ISRAELI NUCLEAR ARMAMENT

26. Since the submission of the 1981 study to the General Assembly, reports on Israel's nuclear capabilities have appeared in various media and publications. Most attention has recently been attracted by an account that appeared in the London Sunday Times on 5 October 1986, based on information by an Israeli technician, Mordechai Vanunu, who was reported to have worked at the Dimona reactor (see paras. 39-32) for nine years, beginning in 1977. According to the article, during that time he took more than 60 colour photographs of the reactor complex, including the building in which he worked, allegedly an underground plutonium separation facility. Among those who interviewed Mr. Vanunu or commented independently on the contents of the interviews in September 1986 were several nuclear experts from the United Kingdom and the United States. Mr. Vanunu was later reported to be "under lawful detention" in Israel. 5/

27. In the view of the above-mentioned experts 6/ and some others who have commented on them, the recent accounts have lent added credence to the view that Israel has acquired a nuclear-weapon capacity, and have even led to higher estimates of Israeli nuclear capabilities than had previously been believed possible. At the same time, it has also been pointed out that a considerable number of questions are still unresolved. 7/

28. The situation remains that "most of the information relating to Israel's nuclear activities is kept secret, and thus the quantity and quality of available reliable information on the subject is such that it is difficult to draw definitive conclusions" (A/40/520, annex, para. 55). That the United Nations is not in possession of conclusive evidence that Israel has the atomic weapon was publicly stated by the Secretary-General in June 1987. 8/

V. ISRAEL'S NUCLEAR DEVELOPMENT

A. Nuclear facilities, activities and resources

1. Nuclear research activities

29. Israel's basic nuclear infrastructure consists of the Israel Atomic Energy Commission (IAEC) and the National Council for Research and Development, which operate and supervise a number of nuclear research institutes and centres. Israel has four major university institutions that train atomic physicists and engineers: the Weizmann Institute of Science at Rehovoth; the Racah Institute of Physics at the Hebrew University of Jerusalem; Technion, the Israel Institute of Technology at Haifa; and the Ben-Gurion University of the Negev at Beer-Sheva. The Israeli Government, through PAEC, controls the Nahal-Soreq Nuclear Research Centre and the Negev Nuclear Research Centre and their reactors. The latter, located at Dimona, is the most advanced atomic research institute. 9/

2. Reactors

30. As noted in the earlier United Nations reports on the subject, Israel has two nuclear reactors: IRR-I and IRR-II, located at Nahal-Soreq and at Dimona, respectively. The Nahal-Soreq reactor, IRR-I, using 90 per cent enriched uranium, is a 5 Mwt pool-type research reactor supplied by the United States and has been in operation since June 1960. It is safeguarded by IAEA.

31. The Dimona reactor, IRR-2, is a natural uranium heavy-water moderated research reactor supplied by France, which went into operation in December 1963. It has never been submitted to international control or inspection. 10/ Visits were paid by delegations from the United States from 1963 to 1969; members of those delegations were reported in 1969 as describing their visits as inadequate to guarantee that the reactor was being used solely for peaceful purposes (see A/36/431, annex, para. 27).

32. The Dimona reactor had an initial thermal capacity of about 25 Mwt. According to press reports in 1980, 11/ the power level of the Dimona reactor was later increased to 70 Mwt. This information has not been confirmed officially. A revision of the plant design of this magnitude would have required a close-down of the Plant for a prolonged period [from one to two years) (see A/40/520, annex, para. 24). It has been estimated that if this information is correct, the annual production of plutonium, believed to have been initially 8 to 10 kilograms or close to what is required for the production of one plutonium atomic bomb, could have increased to 25 kilograms, which would be enough to produce three bombs (see A/36/431, annex, paras. 35 and 36).

3. Uranium extraction and production

33. To solve the problem of fuelling an atomic reactor, Israel's Defence Ministry began to explore the Negev Desert for uranium deposits in 1948. No uranium ore

deposits exist in the area, but it was found to be rich in phosphate deposits containing small amounts of uranium. New processes for its extraction and refinement were developed. Nevertheless, at the time of the first activation of the Dimona reactor, Israel's domestic production of uranium is believed to have amounted to some 10 tons per year, which was 14 tons per year less than was needed for the operation of the reactor. Israel has reportedly been importing natural uranium from a number of sources, mainly Western and African. In one case it has been alleged that Israel obtained natural uranium by irregular methods. Israel has denied this. 12/

34. There are conflicting views on whether or not Israel has subsequently achieved self-sufficiency in natural uranium fuel. According to *one* view this may have happened by 1972, but it has also been claimed that Israel still relied on uranium imports at least as at 1974. 13/

4. Heavy water availability and production

35. In the previous United Nations reports on the subject, it has *been* noted that a small-scale facility for production of heavy water, or deuterium oxide, has been in operation in Israel and that Israel has also received some heavy water from the United States⁶ for research purposes and under safeguards (see A/36/431, annex, paras. 38-40, and A/40/520, annex, para. 38).

36. According to a report published in the United States in November 1986, in the early 1960s Israel imported 20 tonnes of heavy water from Norway and 4 from the United States, pledging to restrict it to peaceful use and to allow inspection, so that suppliers could ensure that the pledge was being kept. The report alleged that Israel had violated its pledge to Norway and may have violated that to the United States. 14/ According to United States officials, the report states, Israel pledged to place the heavy water received from the United States under international inspection. The same sources indicate that the heavy water is still in Israel and is still being safeguarded (inspected) by IAEA. 15/

37. Norway has confirmed the shipments of 20 tonnes of heavy water in the 1960s and one tonne in 1970. The same year, having received a request for an additional 4 tonnes, Norway declined further deliveries. It exercised its right of inspection in 1961, two years before the reactor at Dimona began operation. In April 1987, it was reported that Norway had asked Israel to allow an independent inspection by IAEA of the heavy water it had supplied and stated that if Israel refused inspection, it would consider this a breach of the supply contract and might attempt to recall the material. In May, Norwegian sources indicated that Israel had not responded favourably to the request. For its part, Israel has maintained that it is observing the terms of its agreement with Norway. In July, it was announced that Norway would send a senior official and a nuclear physicist to Israel to renew the request for an independent inspection. 16/

38. There have also been unsubstantiated allegations that heavy water originating from Norway and/or the United States may have been sent from France to Israel in the 1960s. 17/

5. Uranium enrichment

39. Some experts think that Israel may have a capability for either a laser isotope separation (annex, para. 41, and A/40/520, annex, para. 44) or gas centrifuge separation to enrich uranium for weapons use. 18/ According to one of those experts, plants needed for the use of both methods are small enough to be concealed. That expert also notes that, while the laser isotope separation technique could lead to considerable savings, its development may be too costly to be within the reach of Israel. From that point of view, centrifuge separation may be a more practical possibility. However, it has also been suggested that plutonium rather than enriched uranium may be used for Israel's nuclear weapons, if they exist. 18/

6. Plutonium separation

40. A central element of the Sunday Times account was the allegation that a plutonium extraction plant exists in the reactor complex at Dimona, considered by some "perhaps the most critical, piece of information". 19/ The plant is said to have two stories above ground and six underground levels; the production halls for reprocessing are said to extend from underground level four through level two.

41. The Sunday Times account assumes that the reprocessing facility has an annual output of 40 kilograms (88 pounds) of plutonium.

B. Extent of the application of international safeguards to nuclear facilities and material in Israel

42. The safeguards applied in Israel by IAEA are limited to the research reactor supplied by the United States (Nahal-Soreq). The safeguards are applied pursuant to a trilateral agreement between the Governments of Israel and the United States and IAEA. The present agreement was concluded in 1975 (INFCIRC/249) and extended by a protocol of 1977 (INFCIRC/249/Add.1) (see A/36/431, annex, para. 46).

43. None of the other nuclear facilities that Israel is reported to possess is covered by international safeguards. Since Israel is not a party to any agreement by which it would undertake to notify IAEA of such further nuclear facilities, there is no official information about the larger part of Israel's present nuclear programme. Thus, it continues to be impossible to ascertain authoritatively to what extent, if any, Israel's unsecured nuclear facilities, including in particular the Dimona reactor and its associated installations, are used for the purpose of producing weapon-grade material (see A/36/431, annex, para. 47).

VI. ISRAEL'S NUCLEAR WEAPON POTENTIAL

A" Nuclear weapon capability

44. The earlier United Nations reports on the subject have reported widespread agreement among technical experts that, given Israel's nuclear activities and level of expertise, it is capable of manufacturing nuclear explosive devices. They also referred to an expert opinion that Israel was capable of assembling a number of nuclear devices within weeks or perhaps even days. In the 1981 study, it was assessed that Israel in 1980 possessed enough separated plutonium to manufacture 10 to 15 nuclear warheads. On the same basis, it was estimated in the 1985 report that the number in 1985 could be 15 to 20 nuclear warheads (see A/36/431, annex, paras. 50 and 55, and A/40/520, annex, paras. 45, 48 and 49).

45. If the information contained in the Sunday Times account is accurate, it leads to considerably higher quantitative estimates, and earlier qualitative assessments of Israel's nuclear capability, would also have to be revised. According to the nuclear scientists consulted by the Sunday Times, Israel may have assembled between 100 and 200 nuclear weapons of varying destructive power, a speculative estimate that exceeds by several times previous assumptions. They also estimated that this might imply a production rate of perhaps 5 to 10 weapons annually. The experts further expressed the view that Israel's nuclear weapons, if they exist, may be considerably more sophisticated than previously believed.

46. Israel is not known to have tested a nuclear weapon. The view is expressed in the earlier United Nations reports - but not adhered to by all experts - that methods, including the use of computer simulations, may have been developed over the years to be assured that a given type of bomb would work without a prior test-detonation (A/36/431, annex, para. 56; A/40/520, annex, para. 41).

B. Means of delivery

47. The earlier United Nations reports on the subject mention that the Israeli Air Force had a nuclear weapon delivery capability and that by the late 1960s Israel had also developed a missile of its own design, the Jericho (see A/36/432, annex, paras. 57 and 58, and A/40/520, annex, paras. 53 and 54).

48. In July 1987, the International Defense Review reported that Israel had successfully test-fired in May 1967 an intermediate-range ballistic missile capable of carrying a nuclear warhead. The missile, named Jericho II, had travelled 500 miles, doubling its previously known range. According to the report, the missile was expected to be tested soon at a substantially longer range, perhaps up to 670 miles. 20/

49. Concern at the report was subsequently expressed in Soviet broadcasts. 21/ In response, an Israeli official noted that "the Jericho missile, if ~~it~~ exists, is designed to protect Israel ~~against~~ Arab aggression and if ~~its~~ range extends to Soviet borders that is coincidental". 22/

VII. SUMMARY

50. While there is wide speculation, Israel **itself has neither confirmed nor denied** its nuclear capability. As noted in the 1981 study, Israel's nuclear activities, the ambiguity of its statements about its nuclear policy, its refusal either to deny or **to** confirm reports about its nuclear potential and its unwillingness to adhere to the Treaty on the Non-Proliferation of Nuclear Weapons or otherwise accept safeguards on all its nuclear activities have together conveyed the strong impression that it does in fact have the potential to produce nuclear weapons. Although the United Nations does not have conclusive proof that Israel possesses nuclear weapons, circumstantial evidence, together with the factors just cited, would seem to indicate that Israel has developed the **necessary** technology and has the means to manufacture nuclear weapons, if it so chooses.

Notes

1/ **A/36/431.** The study was subsequently issued with the title Study on Israeli Nuclear Armament (United Nations publication, Sales No. E.82.1X.2).

2/ In addition **to resolution 36/98**, the General Assembly has adopted, **between** 1981 and 1984, resolutions **36/87 B** of 9 December 1981; **37/75** of 9 December 1982; **38/64** of 15 December 1983 **and 39/54** of 12 December 1984 on the establishment of a nuclear-weapon-free zone in the region of the Middle East. During the same period, the General Assembly has adopted resolutions **37/82** of 9 December 1982; **38/69** of 15 December 1983 and **39/147** of 17 December 1984 under the agenda item "Israeli nuclear armament".

3/ Since 1981, the General Assembly has adopted the following **resolutions** Specifically on the relations between Israel and **South** Africa: **36/172 M** of 17 December 1981; **37/69 F** of 9 December 1982; **38/39 F** of 5 December 1983; **39/72 C** of 13 December 1984; **40/64 E** of 10 December 1985; and **41/35 C** of 10 November 1986.

4/ Resolutions **36/27** of 13 November 1981; **37/18** of 16 November 1982; **38/9** of 10 November 1983; **39/14** of 16 November 1984; **40/6** of 1 November 1985; and **41/12** of 29 October 1986.

Notes (continued)

5/ Israeli Cabinet statement, quoted in The New York Times, 10 November 1986. Israeli **sources referred** to by the Sunday Times had confirmed that Ms. Vanunu **worked for the Israel Atomic Energy Commission at Dimona**, but had refused to comment on his statements. Prime Minister **Shimon Peres** described the conclusions reached from **it as "sensationalist"** and reaffirmed **that** Israel would **not** be the first to introduce nuclear weapons into the Middle East. (The New York Times, 7 October 1986.)

6/ The comment by **an** American nuclear scientist, Theodore Taylor, has been quoted in paragraph 22 above. Frank Rarnaby, a nuclear physicist from the United Kingdom, who interviewed Mr. Vanunu, is also quoted in the Sunday Times to have concluded: **"His testimony is totally convincing"**.

7/ Some other experts in the United Kingdom consulted by the Sunday Times are reported to have found Mr. **Vanunu's technical** information **incontestable**, but to have expressed scepticism on **several** aspects of his **account**. For examples **of** **unanswered** questions arising from the possible implications of Mr. **Vanunu's information**, should it be accurate, see Leonard S. Spector, Going Nuclear, The Spread of Nuclear Weapons 1986-1987, Cambridge: Ballinger Publishing **Company**, 1987, p. 138; and Gary Milhollin, Israel's Nuclear Shadow, Wisconsin Project on Nuclear Arms Control, 10 November 1987, pp. 16 and 17. See also Foreign Report (London), 13 November 1986, p. 6.

8/ Transcript of **press** conference by Secretary-General **Javier Pérez de Cuéllar**, held in **MOSCOW** on 30 June 1987 (**SG/SM/4016**), p. 8.

9/ **A/36/431**, annex, **paras.** 32 and 33; **A/40/520**; annex, **para.** 22; and Peter Pry, Israel's Nuclear Arsenal, Westview, Boulder, **Col.**, 1984, p. 14.

10/ Since 30 June 1982, when **Egypt** concluded with IAEA a safeguard agreement pursuant to the Treaty on the Non-Proliferation of **Nuclear Weapons**, and therefore all its nuclear facilities are **now** subject to **international** safeguards, all the known **nuclear** facilities in the territories of the Middle East States have been **subject** to international safeguards except **the** reactor at **Dimona** and its related facilities.

11/ Foreign Report [London], 13 August 1980.

12/ **A/36/431**, annex, **para.** 37; **A/40/520**, **paras.** 35-37; Pry, op. cit., pp. 24 and 25.

13/ see Pry, op. cit., p. 25,

14/ Milhollin, op. cit., pp. 5-6 and passim. A brief mention of the Norwegian heavy water supplied to Israel was made in the SIPRI Yearbook 1979, pp. 313, 315 and 316.

15/ Milhollin, op. cit., p. 7.

Notes (continued)

16/ Af tenposten, Oslo, 11 November 1986; The New York Times, 10 November 1986 and 26 May 1987; Financial Times, 16 February 1987. See also Warren H. Donnelly, Israel and Nuclear Weapons (updated 10 July 1987), **Congressional** Research Service, p. 6.

17/ Milhollin, op. cit., p.p. 9-11.

18/ Pry, op. cit., pp. 26-28.

19/ Spector, op. cit., p. 133.

20/ Reuter dispatch, Geneva, 21 July 1987; The New York Times, 22 and 29 July 1987.

21/ The expressions of concern were transmitted by Radio Moscow in its Hebrew-language broadcasts in July 1987.

22/ Washington Post, 1 August 1987; The New York Times, 29 July 1987; Reuter and AFP dispatches, Jerusalem, 24 July 1987, and Tel Aviv, 28 July 1987.