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PROGRAMME FOR PROMOTING NUCLEAR NON-PROLIFERATION

Number 23 **NEWSBRIEF** **3rd Quarter 1993**

Editorial note

This issue of the **Newsbrief** reports on events relating to the non-proliferation of nuclear weapons that took place, or that came to the editor's attention, in the period 1 July-1 October 1993.

The **Newsbrief** is published four times a year as part of the effort of the Programme for Promoting Nuclear Non-Proliferation (PPNN) to foster awareness of the issues related to the spread of nuclear weapons and of developments that may help constrain that spread. Based on publicly available material derived from reputable and generally reliable sources, the **Newsbrief** seeks to present an accurate and balanced picture of pertinent developments, including events relating to the peaceful uses of nuclear energy.

The limited size of the **Newsbrief** makes it necessary to choose among items of information and to present them in condensed and simplified form. Subheadings are chosen for ease of presentation and do not necessarily imply a judgment on the nature of the events referred to. For the same reason, related items of information may be combined under a single subheading, even though some might fit also into other categories of subjects identified in the **Newsbrief**.

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Readers who wish to comment on the substance of the **Newsbrief** or on the manner of presentation of any item, or who wish to draw attention to information they think should be included, are invited to send their remarks to the editor for possible publication.

Unless otherwise stated, sources referred to, and publications listed, date from 1993.

I. Topical Developments

a. Background

- Developments in the **Democratic People's Republic of Korea** (DPRK) remain a source of concern. The recent report that the DPRK has converted into metal plutonium nitrate extracted from fuel irradiated in its 5-MW gas-cooled reactor is seen to lend substance to the claim that it has a weapons programme and might already have extracted a substantial amount of plutonium. Experts contend, however, that it has probably not yet developed the technology of actual weapon production. The latest developments in respect of the DPRK are discussed below in a summary of events at the IAEA's General Conference (27 September-1 October), where the subject received considerable attention (see **g. IAEA Developments: 1. General Conference**). Many reports in the international press about the DPRK's reactions to events at the General Conference are subsumed in that summary.

- During a visit to South Korea, shortly before the scheduled resumption of talks between the United States and North Korea, US President Clinton warned the North that if it persisted in its nuclear-weapon programme, the United States was ready to take 'appropriate countermeasures'. He also said, however, that as long as the DPRK abided by the UN Charter and international nonproliferation commitments it had nothing to fear from America. The DPRK has called Mr. Clinton's remarks provocative and slanderous and accused Japan of seeking an excuse to develop its own nuclear arsenal. Subsequently, in September, the news that the United States was considering the deployment in Japan of an enhanced missile-defence system meant primarily to counter the DPRK's missile potential, and the Japanese military exercises that began late that month, involving over 90,000 members of all armed services, triggered further negative reactions in Pyongyang. The officer commanding American troops in South Korea has threatened the North with annihilation if it should ever try to use nuclear weapons.

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The second round of DPRK/USA talks was held in Geneva in mid-July between US Assistant Secretary of State Robert L. Gallucci and Kang Sok Ju, the DPRK First Vice Minister for Foreign Affairs; both later said that the discussions had been 'useful'. In a joint statement of the two countries, the DPRK said it was prepared to begin consultations with the IAEA on outstanding safeguards and other issues as soon as possible and declared its readiness to resume talks with the Republic of Korea on reciprocal inspections in the context of the North-South Joint Declaration on the Denuclearisation of the Korean Peninsula. The possibility of the US helping the DPRK shift from graphite-moderated reactors to less proliferation-prone light-water reactors, seems also to have been discussed. According to a South Korean press report, the DPRK delegation said that Pyongyang would be willing to eliminate its reprocessing plant in exchange for light-water technology from the United States. United States officials stress, however, that there can be no peaceful nuclear cooperation with the DPRK until it complies unambiguously with its obligations under international agreements. South Korea has similarly indicated it would be ready to assist Pyongyang in a transition to less proliferation-prone light-water reactors, once there is agreement on international as well as mutual, North-South, verification. So far Washington does not seem to have agreed to cancel future 'Team Spirit' exercises. For its part, Pyongyang, which continues to accuse the IAEA of being biased against it and repeats its expressions of concern about supposedly aggressive intentions of the United States, appears to have neither agreed to the demand that it open the two suspected nuclear waste sites to IAEA inspection nor clearly committed itself to continued adherence to the NPT. The two delegations agreed to meet again in two months. However, according to South Korean press reports, the head of the American delegation, Assistant Secretary Gallucci, has told reporters in Seoul that his country would not agree to have a third round of negotiations until the DPRK opened talks with the South and cooperated with the IAEA's inspectors.

On 3-10 August IAEA inspectors visited North Korea. They were again only permitted to service IAEA monitoring equipment at the 5-MW reactor and the partly-completed reprocessing plant at Nyongbyon. The equipment is said to function unattended for three months, after which its batteries need recharging. The inspection team was reportedly refused any further inspection access. Upon the conclusion of the visit the IAEA issued a statement saying that the overall degree of access granted to date was still insufficient for it to discharge fully its responsibilities. Press reports that the DPRK might be softening its allegation that the IAEA lacks impartiality seem to be gainsaid by the reported lack of results from the consultations on the implementation of the safeguards agreement that were held in Pyongyang from 31 August to 3 September, between North Korean officials and an Agency team. No date has been set so far for further discussions (see references below to the IAEA General Conference). A report from Seoul seems to indicate that, in what is called an apparent re-interpretation of the agreement reached, North Korea now appears to condition its acceptance of full-fledged IAEA inspection on United States support for a transition of its nuclear programme from heavy-water reactors to light-water units.

Initial reactions in Seoul to the talks between the DPRK and the United States were hopeful. A Foreign Ministry spokesman saw them as 'major progress towards the resolution' of the issue. On the other hand, president Kim Young Sam has warned that Pyongyang is drawing out the talks in order to gain time for its nuclear programme, and has said that the time is near for the adoption of sanctions against it; similarly, South Korea's Foreign Minister has said that the time had come for his country to take adopt a tougher line in dealing with its Northern neighbour. Seoul reportedly also suggested suspending 'Team Spirit' if Pyongyang would permit full IAEA inspection. Supposedly in an attempt to get the bilateral inter-Korean talks going again, to show that the nuclear issue is essentially an inter-Korean matter which should be settled between Seoul and Pyongyang, South Korea invited the North for a resumption of talks in the Joint Nuclear Control Committee. The North turned this offer down as 'disappointing' and called for a summit meeting between the respective Presidents instead and for an (apparently unconditional) undertaking from the South that the 'Team Spirit' exercises be halted. In early September the North proposed an exchange of special envoys to discuss the creation of a nuclear-weapon-free zone in the Korean Peninsula and other nuclear issues; Seoul responded positively and proposed an early meeting, whereupon Pyongyang is reported to have suggested a later date; it also seems to have once again raised the cessation of the 'Team Spirit' exercises as a precondition for talks.

There is speculation that the apparent ambiguity in Pyongyang's nuclear attitude may reflect differences of opinion within the regime. Russian sources are quoted in Seoul as saying that President Kim Il-song disagreed with his son, party Secretary Kim Chong-il, over the decision to withdraw from the NPT. A defector from the North Korean army has alleged in Seoul that in October 1992 a nuclear accident caused many deaths at the nuclear complex in Yongbyon, when an attempt was made to move a reactor [*sic*] so as to hide it from IAEA inspectors. The officer also spoke of an attempted military coup in the North, last year, and reported that Pyongyang was building silos for long-range missiles targeted at American bases and at Japan. A DPRK spokesman has denied the allegations. There are other unconfirmed reports, however, of hurried attempts to hide nuclear activities from the IAEA, e.g., by storing liquid plutonium waste in hastily rigged, and inadequate, containers.

According to reports from Israel, that country was about to establish diplomatic relations with the DPRK. It is reported that the United States and South Korea have asked Israel to defer commercial talks with Pyongyang until the present problems over its nuclear programme have been settled. Reportedly, Israel had proposed investing in North Korean industry, especially mining, as a means of persuading it not to supply enhanced long-range ('Rodong-1' or 'Scud-D') missiles to Iran. Apparently, Washington does not want these talks held

as long as the DPRK refuses IAEA inspectors access to its nuclear installations. Israel's talks with the DPRK, which are said to have been held over the course of one year, do not seem to have had concrete results so far; they were apparently carried out by high-level officials of the Israeli Foreign Ministry and there are reports that they have also met with opposition within Israel, notably from the Prime Minister. (**The Jerusalem Post**, 24 June, 30 July; **Seoul KBS-1** [Korean Radio], 29 June, in **JPRS-TND-93-021**, 7 July; **Yonhap** [Seoul], 30 June, in **JPRS-TND-93-021**, 7 July; 15 July, in **JPRS-TND-93-023**, 19 July; 20 and 21 July, in **JPRS-TND-93-024**, 27 July; **The New York Times**, July 2, 11, 17, 18, 20, August 5 [two reports], September 18, 28; **The International Herald Tribune**, July 7, August 2, 4, 16, 25; September 2, 3, 7, 23, 24, 28, 29, 30; **Choson Ilbo**, 10 July, in **JPRS-TND-93-023**, 19 July; **Financial Times**, July 10/11, 12, 13, 15, August 11; **Nucleonics Week**, July 8, August 19; **Süddeutsche Zeitung**, 12, 15, 21 July, 10, 16, 25, 27 August, 6 September; **Der Standart** 12 July; **The Guardian** , 12 July, 25 August; **Frankfurter Allgemeine Zeitung**, 15 July; **Reuter's**, July 14, 20, 21, 24, August 10, September 1, 24; **Seoul Sinmun**, 16 July, in **JPRS-TND-93-023**, 19 July; **The Economist**, July 17th, 24th; **NuclearFuel**, July 19, August 30; **Chungang Ilbo** [Seoul], 20 July, in **JPRS-TND-93-024**, 27 July; **United Press International**, July 20; **Defense News**, July 26-August 1; **Die Presse**, 3 August; **Neue Zürcher Zeitung**, 5, 8 August; **IAEA Press Release** PR 93/15, 13 August and PR 93/16, 25 August; **Associated Press**, August 14; **Hadashot** [Tel Aviv], 15 August, in **FBIS-NES-93-156**, 16 August; **The Washington Post**, August 17, September 14; **Agence France Presse**, 24 August; **The Independent**, 26 August, 25 September; **The Boston Globe**, August 26; **IAEA Newsbriefs**, Vol. 8, No. 4, July/August; **Arms Control Today**, September; **Enerpresse** No. 5900, 2 September; **Sankei Shimbun**, 3 September; **Nihonkeizai Shimbun**, 4 September; **Newsweek**, September 6)

- After several months during which **Ukraine** did not seem to get closer to fulfilment of its undertaking of May 1992, to ratify START-I and accede to the NPT as a non-nuclear-weapon state, Ukraine's President Kravchuk and Russia's President Yeltsin, at a meeting on 3 September, at the Crimean town of Massandra, agreed that Ukraine would give up all its nuclear warheads and allow them to be transferred to Russia where they would be dismantled. Ukraine would also sell Russia its share of the Black Sea fleet and lease it the Crimean port of Sevastopol. In return, Russia would write off a large part of the Ukrainian debt (the amount depending on the value to be set on the vessels Ukraine would cede to it), supply Ukraine with uranium fuel, and resume its supplies of oil and gas at current prices. The agreement, prompted by Ukraine's disastrous economic situation — Ukraine is said to owe Russia over $2-billion for oil and gas alone — would imply far-reaching concessions by Kiev. It seems that, in the face of the many strongly negative reactions the agreement has met with in Ukraine — including calls for President Kravchuk's resignation — the latter may be having second thoughts about some of the commitments he has made. Press reports quote him as saying that those commitments went less far than the Russian press claims and were made under duress; he also seems to have said that it was an agreement 'in principle' only. In fact, Russian assertions of agreement on the sale of the Black Sea fleet seem to have been premature. As President Kravchuk has explained, before a decision can be made, a committee will work out the cost of the fleet. Still, acceptance of the agreement by the Ukrainian parliament is not certain. There is said to be strong resistance in particular to the idea of giving up a major portion of the fleet. The international press, particularly in Western Europe, follows the issue closely; many commentators predict that in its present economic predicament, and especially, with the approach of winter, its growing need for Russian oil and gas, Ukraine will eventually have to accept an agreement along the lines discussed at Massandra.

  On 2 July, Ukraine's parliament had approved a new defence doctrine in which it formally claimed Ukrainian ownership of all nuclear weapons on its territory: 130 SS-19 ballistic missiles with 6 warheads each, 46 SS-24s with 10 warheads each, air-launched single-warhead cruise missiles and gravity bombs numbering altogether 416 — for a reported total of 1,656 warheads. The document adopted by the parliament (in a vote of 226 in favour, 15 against and 2 abstentions) contains the statement that Ukraine has no intention to use the weapons and that it remains committed to becoming a non-nuclear state in due time. President Kravchuk, long believed to be in favour of a non-nuclear Ukraine, party to the NPT, supported the decision while affirming that the weapons would eventually be destroyed. In a statement of 4 August, circulated *inter alia* to the member states of the IAEA, the Russian government declared that Ukraine's action was a violation of agreements concluded within the framework of the Commonwealth of Independent States and of the Lisbon Protocol to the START-I Treaty.

  Control of the nuclear weapons is said still to be in Russian hands, but there are reports that the Ukrainian military are working to gain 'positive operational control' — i.e., the ability to target and launch them. In that context, it is noted that the 'permissive action links' — the locking devices that must be released to activate the weapons — are made in Ukraine, by the 'Monolith' factory at Kharkiv, which reputedly also made the guidance systems. While denying that attempts at circumventing the controls are being made, Kiev's minister of defence, Gen. Morozov, has said that the country has the scientific expertise to take control of the weapons if it wanted to do so; the same claim is made by Ukrainian missile experts. Ukraine's controversy with Russia was aggravated by the declaration of the Russian parliament in early July, that the naval base at Sevastopol belongs to Russia — a claim condemned by Russia's President Yeltsin and denounced also by the United States — and by continuing disagreement on the division of units from the former Soviet navy between the two states. In an attempt to find a middle ground between parliamentary hard-liners who reject the NPT, and those who want Ukraine to comply with its undertaking to join the Treaty, defence minister Morozov, during a visit to Washington, proposed that

his country could join the NPT with the status of a 'transition country' in temporary possession of nuclear weapons. The question, what to do with the nuclear warheads once the weapons have been dismantled, has also long been contentious. So far, Moscow has insisted that they should be returned to Russian factories for dismantling, while Kiev has repeatedly called for prior arrangements to verify that they are dismantled and for compensation for the nuclear material in them; if the agreement of 3 September between the two presidents is ratified, these issues should be settled in line with Russia's demand. Earlier press reports from Moscow claimed that Russia had suggested dismantling and storing the warheads initially in Ukraine, and converting them to nuclear fuel in Russia, for eventual return to Ukraine. Reports in July and August that agreement had been reached on an arrangement to this effect were promptly denied in Kiev. It was disclosed during Gen. Morozov's Washington visit that Ukraine had made a start with the dismantling of ten SS-19 missiles ('one regiment') and that the stored cruise missiles would also be dismantled, but American authorities were apparently unable to obtain from Gen. Morozov a commitment with regard to the SS-24 missiles. Not long before his early-September meeting with his Russian counterpart, President Kravchuk stated publicly that the SS-24s were not covered by the Lisbon Protocol of May 1992, and claimed that the issue of the SS-24s would have to be settled in a separate agreement between Ukraine, Russia and the United States. A spokesman in Washington responded with the view that the Lisbon Protocol does cover all missiles on Ukraine's territory, without exception, but it has also been reported that Presidents Clinton and Yeltsin would be willing to conclude an additional agreement on the subject. Meanwhile, in an apparent shift from its earlier condition that Ukraine should first ratify the NPT, the United States Administration is said to have promised to start dispensing funds from the $175 million that is available for assistance to Ukraine, mainly for its dismantling effort. According to American sources, the money is to be disbursed as long as dismantling goes ahead 'at a reasonable rate'. (**The Daily Telegraph**, July 3, 17, 31, September 4, 24, 29; **Le Monde**, 3 July, 5 September; **International Herald Tribune**, July 3-4, 10-11, September 4-5, 6; **Financial Times**, July 3-4, 17-18, August 17, September 4-5; **The Times** [London], 8, 17, 31 July, 16 August, 4, 6 September; **The Washington Post**, July 8; **Foreign Report**, 8 July; **New York Times**, July 8, 25, 26, 28, September 4, 8; **The Observer**, 11 July, 5 September; **Financial Times**, July 10/11, September 4, 6, 24; **ITAR-TASS**, 14 July; **The Guardian**, 24, 31 July, 4, 7 September; **Frankfurter Allgemeine Zeitung**, 26 July, 4 September; **Süddeutsche Zeitung**, 17-18, 26, 30 July, 17 August; **Neue Zürcher Zeitung**, 31 July-2 August, 17 August, 5 September; **The Washington Post National Weekly Edition**, August 2-8; **The Economist**, August 14th, September 11th; **Nuclear News**, August; **Die Presse**, 19 August; **IAEA Document** INFCIRC/421, 1 September; **The Independent**, 4, 6 September; **Salzburger Nachrichten**, 4 September; **Wall Street Journal**, September 6, 7; **Defense News**, September 13-19;)

- Kazakhstan's policy seems to be similar to that of Ukraine. There are said to be 1410 warheads on its territory, of which 1040 belong to the 104 SS-18 intercontinental missiles deployed there; the rest are parts of gravity bombs. Kazakhstan has adopted a law claiming ownership of the weapons. President Nazarbaev has set five conditions which he said 'could accelerate' the process of nuclear disarmament: Kazakhstan should retain the missiles for its own commercial use; the nuclear material in the warheads should be available for Kazakh use, either domestically as nuclear fuel or for export; the silos should left to serve as sites for nuclear power stations; Kazakhstan should get a share of Western funds paid for the dismantling of Russian weapons; and it should receive security guarantees. (Mikhail Ustiugov, 'A "Temporarily Nuclear State" ', in **The Bulletin of the Atomic Scientists**, October)

b. NPT Events

- **Belarus** deposited its instrument of accession to the NPT in Washington, on 22 July. Belarus' President Stanislav Shushkevich handed the document to President Clinton at the White House. Other former Soviet Republics that have joined the NPT since September 1991 are **Azerbaijan**, **Estonia**, **Latvia**, **Lithuania**, and **Usbekistan.** (**State Department Statement**, 23 July; **IAEA Newsbriefs**, Vol. 8, No. 4, July/August)

- The final communique of the **Economic Summit** of the seven most highly industrialised countries ('G-7') held in Tokyo in early July contains a phrase reiterating 'the objectives of universal adherence to the NPT as well as the treaty's indefinite extension in 1995 and nuclear arms reduction'. It is understood that this formulation, in which indefinite extension appears in second place and is followed by a reference to Article VI of the NPT, reflected Japan's hesitation to commit itself at that point to the indefinite extension of the Treaty. At the G-7 summit meeting in Munich, in 1992, Japan had agreed to indefinite extension, but it appears to have moved somewhat from unreserved support of that position since then. Reportedly, a number of conservative Japanese politicians do not wish to exclude forever the possibility of Japan's acquiring nuclear weapons. This consideration is said to be fuelled by concern about developments in North Korea, which some say might compel Japan to develop nuclear means to defend itself and the region, the more so if, as some Japanese commentators seem to fear, the United States 'nuclear umbrella' becomes less effective as a result of a shift of emphasis on domestic preoccupations. Others reportedly reason that Japan, which is technologically capable of developing nuclear weapons, wishes to retain a means of persuading the major powers to divest themselves of their nuclear arsenals, a leverage it might lose if the Treaty were extended indefinitely. Lastly, there are believed to be worries among government and industry that in the case of an indefinite extension of the Treaty, Japan might be restricted in its freedom to choose its energy policy, including the use of plutonium. Explaining Japan's attitude to NPT extension, a Foreign Ministry spokesman said after the summit meeting that Japan had no intention to acquire nuclear weapons and supported the treaty's extension,

but that it could not ignore differences of opinion whether it should be renewed indefinitely; in a matter which could determine the future of the nation for many years to come, the spokesman is quoted as saying, there should at least be sufficient public debate. Japanese as well as some foreign newspapers, however, see a possibility of a change in Japan's policy, under which the way would be kept open for a Japanese nuclear self-defence policy in the event of a regional nuclear threat. In late July, then foreign minister Muto, who had previously called for indefinite extension of the Treaty and repeated that demand at the ASEAN meeting in Singapore on 28 July, was quoted as saying that by withdrawing from the NPT, Japan might keep North Korea from developing a nuclear weapon. Press reports speak of concern among neighbouring countries about the apparent change in Japan's attitude. Commentators recall that Japan's 'Three Non-Nuclear Principles' not to manufacture or possess nuclear weapons or allow them into Japan's territory, are merely an understanding adopted by the cabinet in the 1960's, and not legally binding. There are some suggestions that they should be formally adopted as law. The matter seems to have been settled for the present, however. Following reports of dissent in the new eight-part coalition government on the issue of NPT extension — with Foreign minister Hata, a member of the centrist Renewal Party, calling for a national consensus on unlimited extension, and Science and Technology minister Eta, a left-of-centre politician advocating a substantial but not unlimited extension, on condition that this does not stand in the way of peaceful uses of nuclear energy and that nuclear disarmament is promoted — Prime Minister Hosokawa, in his policy speech to the Diet on 23 August announced his government's support of indefinite extension. Minister Eda was quoted as saying that the indefinite extension should be accompanied by concrete and prompt reductions in nuclear armaments, and that the possibility of parties to enjoy the benefits of peaceful utilisation of nuclear energy should be guaranteed. These points are seen as conditions for concurrence with an indefinite extension; commentators are cited in this connection that Prime Minister Hosokawa had not spoken of an 'unconditional' extension. (**Atoms in Japan**, Vol. 37, No. 7, July, No. 8, August; **Defense News**, July 5-11; **Associated Press**, July 7, 13; **Reuter's**, July 8, 9; **Summit Political Declaration — USIA European Wireless File**, July 9; **The Independent**, 9 July; **The Guardian**, 10 July; **Nucleonics Week**, July 15, August 12, 26; **The Washington Post**, July 15; **Washington Post National Weekly Edition**, July 19-25; **Kyodo** [Tokyo], 28 July, in **JPRS-TND-93-025**, 2 August; **United Press International**, July 28; **The New York Times**, August 8; **Reuter's News Agency**, August 9)

c. Other Non-Proliferation Developments

- At a special session in August 1992, the General Conference of the **Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean** approved amendments to Articles 14, 15, 16, 19, and 20 of the **Tlatelolco Treaty**. The safeguards agreement between Argentina, Brazil, the Argentine-Brazilian Agency for Accounting and Control of Nuclear Material (ABACC) and the IAEA has been ratified by the Argentine Parliament and approved by the Brazilian House of Representatives, even though its inspection provisions had been criticised there as a possible opening for industrial espionage by 'outsiders'. The agreement is now before the Brazilian Senate, which is expected to approve it in the near future. Negotiations with the IAEA on subsidiary arrangements started in early September and are said to make good progress. ABACC has so far examined design information on 75% of the facilities of which it has been notified, has inspected 45% of them and hopes to verify all of them by the end of the current year. Reportedly, however, Brazilian scientists criticise ABACC's work as not vigorous enough; they have also expressed concern at the undue influence of the military on a large segment of Brazil's nuclear activities and have called for greater openness. **Chile** has announced that it is preparing to ratify the Tlatelolco Treaty. (**IAEA Document** INFCIRC/411, 12 July; **Gazeta Mercantil** [Sao Paulo], 25 June, and **O Globo** [Rio de Janeiro], 14 July, both in **JPRS-TND-025**, 2 August; **statements** by the heads of the delegation of **Argentina**, **Brazil** and **Chile**, and of the Secretary of **ABACC** at the 37th Regular Session of the IAEA's General Conference)

- In his first address to the United Nations General Conference, **United States** President Clinton unveiled a new comprehensive non-proliferation plan. As explained in a separate 'fact sheet', this includes a proposal for a multilateral agreement on a world-wide, phased-in stop of the production of high-enriched uranium (HEU) and plutonium for use in nuclear weapons, leading gradually to a global cut-off of all production. The President has offered to put American stocks of 'excess' weapons-grade plutonium and HEU under IAEA safeguards. The plan further expresses support for a comprehensive test-ban treaty and calls for the establishment of nuclear-weapon-free zones in southern and eastern Asia, Africa and the Middle East. The President's statement expressed 'limited approval' of the production and use of highly-enriched uranium or plutonium for peaceful purposes in a small number of industrialised countries, subject to IAEA safeguards and with any excess plutonium being used as soon as possible, so as to avoid stockpiling. Reportedly, the Administration chose not to call for an immediate global halt of plutonium production, for fear of alienating states such as France, Japan and the United Kingdom, which are engaged in reprocessing; press comments indicate that the latest version of the plan as issued shows the effects of German and Japanese interventions in Washington. However, presumed near-nuclear states like the DPRK, India, Israel and Pakistan, as well as South Africa and South Korea, are discouraged from producing HEU or plutonium for any purpose whatsoever. Critics see the fact that the plan would concur with the use of plutonium by certain countries as reflecting a double standard. Environmentalists also criticize it for ignoring the fact that reactor-grade plutonium is also usable in nuclear weapons; they press the Administration to ban all plutonium production, regardless of intended use. Some members of Congress try to shape a less permissive US plutonium policy by means of amendments to the Fiscal Year 1994 Defense Authorization Act currently before the House. One of these, adopted on 13 September in

the House of Representatives, states as 'the sense of the Congress' that the start-up and continued operation of any reprocessing plant represents serious environmental hazards and increases the risk of proliferation of weapons-usable plutonium, and should be suspended until these concerns have been resolved. Another bill, apparently aimed specifically at the UK's THORP plant, was introduced on 14 September. Yet another draft amendment to the FY94 Defense Authorization Act would withhold from Russia the $75-million grant earmarked for the construction of a storage facility for material from dismantled warheads, until the Administration certifies that Russia has stopped separating plutonium. The President's expression of support for the creation of various nuclear-weapon-free zones confirms recent reports that the US Administration was reviewing the long standing American policy of opposing regional denuclearisation arrangements whereby the freedom of navigation of ships armed with nuclear weapons might be impeded. Indications were also seen that the US might move towards accepting the protocols to the Rarotonga Treaty. The change in policy is also believed to affect Washington's attitude to the proposed South East Asian nuclear-weapon-free zone. Indonesia's Foreign Minister, Ali Alatas, announced on 28 July that plans for such a treaty were in an advanced stage.

In a departure from established policy, the US Department of Energy has announced that it will take back highly-enriched uranium fuel of American origin which has been irradiated in research reactors abroad. Reportedly, as pointed out by the IAEA, some operators were facing acute storage problems. Also, as reported, US authorities, the State Department in particular, were concerned about proliferation risks arising from the stockpiling of weapons-grade material. The take-back practice had been suspended following challenges by environmentalists. The new policy faces problems from the House of Representatives, however, where a bill is pending that would limit the take-back possibility, by prescribing that before any foreign spent fuel can be shipped to the United States, the Department of Energy first has to determine that an emergency situation exists, notify the Congress of the emergency, and wait 30 days of continuous Congressional session before accepting the fuel. Since the bill does not define 'emergency' there is some concern that this term will be interpreted narrowly, as only meaning an immediate risk of proliferation.

A proposal to set up a committee run by the Department of Defense to deal with nuclear proliferation is said to raise concern in the United States Senate about its apparent emphasis on the use of force to counter proliferation. (**Asahi Shimbun**, July 4; **The Washington Post**, July 13; **Associated Press**, July 14; **Süddeutsche Zeitung**, 15 July; **The New York Times**, July 28; Press release of the **Nuclear Control Institute** [Washington], July 28; **The International Herald Tribune**, July 29, September 24, 28; **NuclearFuel**, July 19, August 2, 16, 30, September 13, 27; **Nucleonics Week**, September 16)

- Reputedly under US pressure, **Russia** has agreed not to pursue its deal with **India** for the supply of ballistic missile equipment and technology. Over half the technical drawings are reported to have already been delivered, however, and India claims that it will be able on that basis to develop the technology itself, albeit slowly. Disagreement between Moscow and Washington over the matter — Moscow claims that the cryogenic engines of the rockets cannot be used for military purposes; Washington says their sale violates the Missile Technology Control Regime (MTCR) — is said to have prompted the Russian Prime Minister in June to postpone a visit to the United States to discuss bilateral cooperation in space research, but official Russian sources stress their continuing interest in cooperation with the United States in this area and talks on bilateral space cooperation resumed in July. **Indian** sources have reacted angrily to the American intervention, accusing Washington of misusing the MTCR to prevent the sale for commercial reasons. According to Indian press reports, **Kazakhstan** has offered India space engine technology and cooperation in space research. The Kazakh Deputy Prime Minister has denied these reports, calling them a misinterpretation of his proposals; he is quoted as saying that he merely referred to the potential use of the Baykonur Space Centre as a launching site for Indian space vehicles, once that base, which at present is in bad repair and manned by Russian troops, has been rehabilitated and adapted for civilian uses.

- **China** has denied the American claim that it had violated the MTCR by selling M-11 missile components and technology to **Pakistan**, in 1992. A press agency report cites China's foreign minister as calling the US claim that such a sale took place 'simply fabricated'. Pakistan has also denied the claim. China is not party to MTCR but has undertaken to observe its provisions. The US Administration insists that the sale did take place and ran counter to the MTCR and has decided to impose trade sanctions on both countries. These will reportedly consist of a two-year ban on US sales of high-technology equipment to China for an estimated value of $500 million, affecting especially the supply of satellite and rocket equipment. Beijing has reacted indignantly to the US action, calling it a 'naked hegemonistic act', and has threatened to reconsider its commitments to the MTCR. Its sharp reaction is seen as having been prompted in part by the fact that the US is also accusing it of shipping chemicals to **Iran** that could be used for the production of chemical weapons. A Saudi-American inspection team has checked the cargo of the Chinese freighter *Yinhe* in the Persian Gulf, without finding indications of the presence of the suspected chemicals. China has called for a formal apology and a compensation of $13 million for delaying the ship by what it terms 'American unilateralism' and 'hegemonism and power politics', but while expressing regret over the 'unfortunate' inconvenience, Washington has refused the Chinese claim, stating that it had acted in good faith on information that turned out to be false. A third factor to have disturbed Sino-American relations seems to be the report of the impending sale by the United States to Taiwan of 41 *Harpoon* anti-ship missiles, to be fitted on the three American *Knox*-class frigates which Taiwan has leased. There are reports that Washington may be reconsidering its hasty reaction in the matter of the missiles. The US Assistant Secretary of

State for Asia and the Pacific is said to have told Beijing that if it adhered to the MTCR, the US might lift the sanctions. There is also debate over whether, indeed, M-11 missiles are covered by the Regime. (**Itar-Tass** [Moscow], 23 June, in **JPRS-TND-93-020**, 28 June, 14 July, in **JPRS-TND-93-023**, 19 July, and 20 July, in **JPRS-TND-93-024**, 27 July; **Delhi TV**, 9 July, in **FBIS-NES-93-131**, 12 July; **Delhi Patriot** and **Indian Express**, 19 July, in **JPRS-TND-93-025**, 2 August; **The Hindustan Times**, Delhi, 22 July, in **FBIS-NEW-93-144**, 29 July; **Agence France Presse**, 24 July, in **JPRS-TND-93-025**, 2 August; **International Herald Tribune**, June 26, August 26, September 3, 6, 7; **Xinhua [Beijing]** and **Beijing China Radio International,** 29 June, both in **JPRS-TND-93-021**, 7 July; **All India Radio** [Delhi], 15 July, in **JPRS-TND-93-023**, 19 July; **The New York Times**, July 17, 26, August 25, September 3; **Moscow Radio Rossii Network**, 24 July, in **JPRS-TND-93-025**, 2 August; **Nature**, Vol. 364, 29 July; **India Today**, August 15; **The Boston Globe**, August 26; **Daily Telegraph**, August 26, 28; **Wall Street Journal Europe**, August 27-28; **The Times** [London], 26, 27, 28 August; **The Guardian**, 28 August, 6 September; **Newsweek** and **Time**, August 30; **The Times** [London] 3, 6 September; **Jane's Defence Weekly**, 4 September; **Arms Control Today**, September)

d. Nuclear Disarmament and Arms Limitation

- The new **United States** Administration has laid out its position on the Treaty on the Limitation of Anti-Ballistic Missile Systems ('ABM Treaty') of 1972, as prohibiting the development, testing and deployment of sea-based, air-based, space-based and mobile land-based anti-ballistic missile systems. This is a departure from the 'broad interpretation' of the Treaty by the Reagan Administration, which had read the Treaty as permitting the development and testing of a space-based ABM system. (**The New York Times**, July 15; **Arms Control Today**, September). See also **i. Events in Nuclear-Weapon States**.

- The question of the safe and economic disposition [*sic*] of excess weapons-grade plutonium is receiving much attention in the **United States**. A report commissioned by the Department of Energy, on options for disposing of plutonium pits from dismantled warheads, concludes that the best solution is burning the material in the form of mixed-oxide fuel in advanced light-water reactors. The report, which came out just when the Department of Energy published its plans for reconfiguring its nuclear weapon complex, including a proposal for a large facility for the long-term storage of plutonium, discusses several reactor designs that could serve the purpose. The second phase of the study, which would reportedly deal with areas of uncertainty and risk identified in the report, has been delayed pending the assessment by a departmental committee of a range of alternatives. A group of companies recently proposed to the US Department of Energy (DOE) that it should acquire units 1 and 3 of the Washington Public Power Supply System — on which work stopped in 1983 — and have them completed as plutonium burners in which excess plutonium could be disposed of; the cost would be covered largely through the sale of electricity produced by the heat generated in the process. A consortium of companies that have worked for DOE under contract would first make a one-year feasibility study. If this was successful, authorisation were given right away and the reactors bought from the power company, the proposal reportedly suggests that both units could be operational by the year 2000 and could burn two tons of Pu a year, in MOX fuel, to be fabricated at a currently unused fabrication plant at Hanford, from plutonium now stored at the Pantex facility in Texas. A report prepared by the Office of Technological Assessment (OTA) of the US Congress says that the Government lacks a clear policy for dismantling weapons and storing or use of the material derived from them and is unprepared for the task. It faults the Administration for the secrecy with which the matter is handled, as well as for the absence of cost estimates for various options. Reportedly, Energy Secretary O'Leary shares the view that shortcomings such as described in the report did exist under the previous Administration, but is holding out hopes for speedy improvement. (**NuclearFuel**, August 2, September 27; **Nucleonics Week**, August 19, September 16; **Nuclear Engineering International**, September; **The New York Times** and **The Washington Post**, September 24)

e. Nuclear Testing

- In a radio address on 3 July, **United States** President Clinton announced that he had ordered the moratorium on nuclear testing to be extended for 15 months and called on other nuclear powers to do the same. The President affirmed that after a through review his administration had determined that the nuclear weapons in the United States arsenal were safe and reliable. He added that '[a]dditional nuclear tests could help the US prepare for a test ban and provide for some additional improvements in safety and reliability. However, the price [the US] would pay in conducting those tests now by undercutting [its] own nonproliferation goals and ensuring that other nations would resume testing outweighs these benefits.' He had therefore decided to extend the current moratorium on US nuclear testing 'at least through September of next year, as long as no other nation tests'. In the wake of reports, meanwhile borne out by events, that a test by **China** was imminent, the American Administration is said to have decided that it need not respond by resuming its own tests immediately and that it should first consult Congress. In *The Bulletin of the Atomic Scientists* of October, a prominent American nuclear-weapons expert, Dr. Richard Garwin, says that 'a reliable stockpile of nuclear weapons identical to those [the US] plan to keep in the inventory after 1996 can be maintained for many decades by the same kind of sampling and non-nuclear testing and remanufacturing that [the US] practice now'; there was, therefore, 'no necessity to test'. (**White House Press Release**, July 2; **The New York Times**, July 3; **US Information Service — European Wireless File**, July 7; **The Bulletin of the Atomic Scientists**, October, pp. 11-12; **The Washington Post**, September 25; **International Herald Tribune**, September 27)

- In the face of persistent reports that **China** was about to detonate a nuclear device — as it did on 5 October — US President Clinton on 17 September publicly urged

that country to 'step away' from resuming its nuclear testing and, obviously mindful of the current strain in relations between China and the United States, called on other countries that 'have relationships' with China to encourage Beijing to refrain from testing. At the United Nations' General Assembly in New York, Japan's Foreign Minister put the same request to his Chinese colleague Qian Qichen, who reportedly answered that China had made the lowest number of tests and treated the issue 'in a disciplined way'. In his main address to the Assembly Minister Qian Qichen said that China would work with other countries for a comprehensive test ban treaty at an early date; he also called for a no-first-use undertaking and negative security guarantees for all non-nuclear-weapon states and nuclear-weapon-free zones. Earlier, at a meeting in Singapore with US Secretary of State Warren Christopher, the Chinese Foreign Minister was said to have expressed his country's willingness to adhere to the present moratorium on nuclear-weapons testing and to have negotiations about a comprehensive test ban as of 30 September 1996. US Under Secretary of State Lynn Davis had further discussions on the issue in Beijing in late July and is said to have had a 'cool reception' there. Already then, American officials were cited as holding out little hope that China could be persuaded not to test. The international media have long seen China's military as pressing for a speedy resumption of testing. In June, the *Beijing Institute of Applied Physics and Computational Mathematics* published a series of articles on issues relating to nuclear testing. In one of these, the United States legislation calling for a comprehensive test ban by 1996 was welcomed, while the moratorium was rejected as devoid of meaning; the article seemed to imply that China would not accede to a comprehensive test ban unless it had first carried out a number of further tests, and there had been further large-scale disarmament between the two major powers. A second article stressed the importance of verification of a CTBT; and the third explained China's position, recalled its no-first-use undertaking and the reasons why it needed to develop its nuclear armament, and called for worldwide nuclear disarmament as a condition for a 'worldwide disarmament meeting'. (**Beijing Institute of Applied Physics and Computational Mathematics**, 3 June, in **JPRS-TND-93-024**, 27 July; **Süddeutsche Zeitung**, 6 July; **The New York Times**, July 26, September 18; **Neue Zürcher Zeitung**, 27 July; **State Department Report**, September 17; **The Independent**, 23 September; **Asahi Shimbun**, 29 September; **International Herald Tribune**, September 30)

- President Mitterand also announced in early July that **France** would maintain its moratorium on nuclear testing and was in favour of a comprehensive test-ban treaty, on condition that this was global and verifiable. The President added that France must preserve the integrity of its nuclear deterrence. The Gaullist Prime Minister, Balladur, confirmed that he fully agreed with the President; he announced the establishment of a high-level group of military and scientific experts to ensure that the suspension of testing would not jeopardise France's nuclear deterrent. French newspapers have pointed out that the announcement did not give a duration for the extended moratorium, and reported on criticism of the President's decision in military and scientific circles, where the move was feared to put the modernisation and further development of France's nuclear arsenal at risk. France's Defence Minister Léotard, reflecting the views of a vocal group of right-wing politicians and the military, stated that 'the harm' that may be done by the decision to suspend testing would be clearly considered, that tests would be resumed if necessary, that France might even resume its tests at Mururoa in the course of the present year, and that it must retain total autonomy in the matter, with its national interest as the sole criterion. This view has been supported to some extent by a number of centrist politicians. (**Agence France Presse**, 4, 9, 12, 14 July; **Le Monde**, 6 and 14 July; **Le Figaro**, 5 and 15 July; **La Libération**, 5 and 15 July; **The Times** [London] and the **Financial Times**, 5 July; **International Herald Tribune**, July 5; **Süddeutsche Zeitung**, 13 July; **Die Presse**, 30 July)

- The **United Kingdom**, which does its weapons-testing in Nevada and is prevented from carrying out any tests as long as the US adheres to its moratorium, reportedly expressed its opposition at the highest level, both in Washington, and in Tokyo, during the July summit conference. The expressed view of the British government is that 'some limited further testing need not prejudice progress towards a satisfactory comprehensive test ban'. British experts are quoted as expressing concern that without some further testing the safety and reliability of the UK's Trident warheads cannot be assured, and Britain may be unable to develop the new tactical weapon which it had said it needed. The Ministry of Defence has said that it hoped to have consultations on the matter with the United States and other nuclear powers. (**Press Association**, 3 July, in **JPRS-TND-93-022**, 12 July; **The Times** [London], **The Daily Telegraph** and **The Guardian**, all 5 July)

- On 10 August, the **Conference on Disarmament** decided to give its Ad Hoc Committee on a Nuclear Test Ban a mandate to negotiate a comprehensive test ban treaty (CTBT), and requested the Committee's Chairman to make the necessary arrangements to conduct consultations between 3 September 1993 and 17 January 1994 on the specific mandate for, and the organisation of, the negotiations. The decision reportedly followed consultations between the five acknowledged nuclear-weapon states, who are said to plan negotiations among themselves on a CTBT. (**CD Document** CD/1212, 10 August; **direct information**.)

- On 10 and 11 August a **special meeting of the States Party to the Partial Test Ban Treaty** (PTBT) was held at United Nations Headquarters, chaired by Indonesia's Foreign Minister Ali Alatas, President of the PTBT Amendment Conference. Observers noted the presence of a United States delegation, participating in multilateral deliberations on a comprehensive test ban for the first time since the Clinton Administration took office. Reportedly, the Administration had hesitated doing so, because it did not wish to anger China and France, which are not parties to the PTBT and with which five-party consultations on a comprehensive test ban are under way. These hesitations were apparently overcome by the wish not to offend non-aligned nations, the thought that non-participation might give

the appearance of a lack of interest in a multilateral comprehensive test ban, and the consideration that the PTBT amendment process might eventually provide a useful avenue to give a multilateral dimension to an agreement worked out in a more restricted forum. (**The International Herald Tribune**, August 7; **Associated Press**, August 6, as attached to **Press Release** of **Parliamentarians for Global Action**, 10 August; **Kurier**, 8 August; **The Bulletin of the Atomic Scientists**, October)

- The **United States** Senate Armed Services Committee has voted to eliminate 'Safeguard C', the programme that ensures the country's readiness to resume atmospheric testing. 'Safeguard C' was set up in 1963 to help gain the concurrence of the Joint Chiefs of Staff with the limited test ban treaty of that year. At a cost of $20 million a year it is said to have cost more than $1 billion so far. The full Senate and the House of Representatives will need to agree with its eventual elimination. (**The New York Times**, July 24)

- There is said to be renewed interest among nuclear scientists in **Russia** in the peaceful use of nuclear explosions — see below, under **j. Events in the Commonwealth of Independent States**

f. Nuclear Trade and International Cooperation

- The Commission of the European Community is finalising a 'Master Plan' to administer nuclear safety assistance to nuclear facilities in Eastern Europe and former Soviet republics. The French and German companies, Bayernwerk AG and Electricité de France, which are working together to upgrade the reactors at Mochovce, in the Slovak Republic, are said not to be willing to help with the backfitting of the VVER-440-213 units there unless the government agrees to an early shut-down of the two older VVER-440-230s at Bohunice. The Slovak Prime Minister has announced plans to continue operation of the older reactors until 2010, but the companies wish decommissioning to start by 1995. An experts' meeting set up by the IAEA at Slovakia's request is quoted as saying that major upgrading of the Bohunice plant is technically feasible, but the two companies are said to hold the view that major upgrading cannot be justified on economic or safety grounds. **Bulgaria** has asked Electricité de France to help it analyse potential improvements in the instrumentation and control systems of its VVER-1000 Kozloduy-5 and -6 units, which have been operating since the late 1980s, with Soviet-supplied instrumentation and control (I&C) equipment. Bulgaria is the first recipient of a grant from the nuclear safety account set up by the 'G-7': the group of the seven most industrialised nations. The deputy head of Russia's atomic energy ministry, Minatom, has assailed Germany for unfair competition in nuclear affairs, accusing it of having shut the VVER reactors at Greifswald down to replace their instrumentation with German equipment (an assertion flatly denied by German authorities), and of insisting on the closure of the RBMK reactors in order to sell Russia German plants instead. (**Atom**, July/August; **Nucleonics Week**, August 5, 19, September 16; **Financial Times**, 25 August)

- **China** and **India** are said to seek foreign markets for heavy water. Both have reportedly offered to sell heavy water to **South Korea** (see below, **h. Peaceful Nuclear Developments**) which operates Candu-type reactors. India is also reported to be interested in selling to **Argentina**, for Atucha-2. That plant should be completed in 1998, but it is believed to need a foreign source of heavy water for its initial inventory, since Argentina's commercial-scale plant at Arroyito is not expected to start operation until 1994. Since Argentina is not yet subject to full-scale safeguards, Canada is not in a position to sell it heavy water. (**NuclearFuel**, August 16)

- It has been reported from Prague that in 1989 **Czechoslovakia** and the **Democratic People's Republic of Korea** signed a protocol on scientific and technical cooperation in the peaceful uses of nuclear energy. According to the report, already in 1988 Czechoslovak nuclear experts went briefly to North Korea. Czechoslovakia had also supplied the DPRK with nuclear technology. Apparently, there had been several brief visits by Czechoslovak personnel, pertaining mainly to energy and medical aspects, as well as safeguards. Some North Koreans were said to have come to Czechoslovakia on short training assignments, mainly in connection with nuclear medicine. According to an official North Korean source there was no supply of nuclear technology; the Czech foreign ministry called the contacts between the two countries 'very sporadic'. (**Rude Pravo** [Prague], 19 July, in **JPRS-TND-93-024**, 27 July)

- An agreement has been signed between **Iran** and **China** for the construction of a 300-MW nuclear power plant near Teheran. At the signing ceremony, it was underlined that the cooperation between the two countries will be carried out under IAEA safeguards. Reportedly, Iran will pay for China's assistance in raw materials, including oil and steel, and in various unspecified Iranian products. It is understood that the reactor will be similar to the PWR China has constructed at Qinshan. Although that plant is of Chinese design, China had to rely on foreign suppliers for a number of important components. Some Western experts take the view that if China is to complete the Iranian power station within a reasonable time, it will again have to obtain some equipment abroad. Since, however, Western supplier states are not expected to be willing to supply Iran with nuclear technology, there appears to be some doubt about the viability of the project. **Russia**, which has a cooperation agreement with Iran for the supply of two 400-MW power reactors, is reported to have said that it is willing to help finish the Bushehr power plant which the German firm Siemens started building in 1975, and on which work was stopped in 1979. In an interview with a Moscow periodical, Russia's Deputy Minister for Atomic Energy bluntly criticised the US Administration's objections to his country's planned supply of power reactors to Iran. (**The New York Times**, July 7; **Enerpresse**, 8 July and no. 5884, 11 August; **Nucleonics Week**, September 16)

- Negotiations between **Russia**'s Ministry of Atomic Energy and the **United States**' Department of Energy,

on conditions of the latter's purchase of high-enriched uranium from dismantled nuclear weapons of the former USSR, appear to be slowed down by Russian insistence on a link between the HEU agreement and access for Russian producers to the United States natural uranium market. Russia claims that market is practically closed to it, now that the US Department of Commerce has set a quota price for Russian natural uranium well above current market rates, in consequence of its finding that Russian suppliers had sold natural uranium in the United States at dumping prices. Russia reportedly seeks both a guaranteed annual share of the US natural uranium market of 5,000 MT and and of the market for uranium enrichment, at 'fair market prices', i.e., several dollars/lbs below the price set in the antidumping agreement. (**NuclearFuel**, July 19, August 30, September 13)

- Westinghouse Electric of the **United States** has received authorisation to supply the **Russian Federation** with PWR technology and fuel, and intends to bid to supply new power plants to Russia if it decided to shut down its RBMK reactors and opts for a new generation of nuclear power plants. However, if Russia chooses to extend the life of its RBMK reactors, Westinghouse says it would work on technology upgrades. (**Nucleonics Week**, July 29)

- It has been disclosed in the **United States** that an American firm recently imported over 700,000 pounds of U308 of **Mongolian** origin. (**NuclearFuel**, July 5)

g. IAEA Developments

1. General Conference

- The 37th Regular Session of the General Conference of the IAEA was held in Vienna, from 27 September to 1 October. It was attended by representatives of 96 member states. President was Dr. Saleh Abdulrahman Al-Athel of Saudi Arabia.

  The Conference approved a zero-growth budget for 1994 of US $201,103,000 (including $68,602,000 for safeguards) and a target of US $58,500,000 for voluntary contributions to the Agency's Technical Assistance and Co-operation Fund. (**IAEA Document GC(XXXVII)/1062**, Annex IV, A, B).

  The General Conference approved by acclamation the nomination of Dr. Hans Blix for a fourth term as Director General. (**IAEA Document GC(XXXVII)/1058**, 25 June; **Press Release** PR 93/19, 28 September).

  Applications for membership of the IAEA from the **Republic of Armenia**, the **Czech Republic**, the **Republic of Kazakhstan**, the former Yugoslav Republic of **Macedonia**, the **Republic of the Marshall Islands** and the **Slovak Republic** where approved. Armenia has meanwhile deposited its instrument of ratification, which brings the Agency's membership to 117. (**IAEA Documents GC(XXXVII)/056, 1054, 1057, 1083, 1055** and **1053**.)

  The Conference elected Colombia, Cuba, Ethiopia, Indonesia, Ireland, Lebanon, Philippines, Poland, Switzerland, Tunisia and Ukraine as new members of the Board of Governors. Besides these 11 new members the 35-member Board comprises Argentina, Australia, Brazil, Canada, Chile, China, Egypt, Finland, France, Germany, Hungary, India, Italy, Japan, Libyan Arab Jamahirya, Malaysia, Nigeria, Paraguay, Russian Federation, Saudi Arabia, Sweden, Syrian Arab Republic, the United Kingdom and the United States of America (**IAEA Press Release** PR 93/20, 30 September).

  The General Conference discussed major Agency activities related to nuclear power, nuclear safety, waste disposal, and technical co-operation in these areas (**IAEA Press Release** PR 93/18, 27 September). It adopted resolutions on, among other subjects, the strengthening of nuclear safety through the early conclusion of a nuclear safety convention (**GC(XXXVII)/1093**, 30 September); ways of obtaining predictable and assured resources to finance technical assistance (**GC(XXXVII)/1097**, 30 September); and the issue of food irradiation in developing countries ((**XXXVII)/1094**, 30 September). A number of speakers underlined the need for a fair distribution of funds among promotional and regulatory activities, especially safeguards, and a resolution was adopted that called for an adequate balance among the Agency's main activities (**GC(XXXVII)/1095**, 30 September). The Board will also remain seized of the question of financing of safeguards. (**GC(XXXVII)/1063**, 25 June; **GC(XXXVII)/1097**, 30 September)

- At the session of the Board of Governors preceding the General Conference the Director General reported on the state of play with regard to **safeguards in the DPRK**. His report indicated, among other things, that the DPRK held the view that the implementation of the safeguards agreement should be discussed in the context of the special situation created by the temporary suspension of the effectuation of its announced withdrawal from the NPT, thus putting restrictions on the Agency's access not only with regard to special inspections but to routine inspections with regard to the DPRK's declared nuclear material and installations — in fact, as he said in his speech to the General Conference, the DPRK had suggested merely 'token safeguards measures'. In agreeing to a further round of consultations, the DPRK had also once again raised the issue of the Agency's 'partiality and injustice'. In response, the Director General had pointed out that the Agency had requested to carry out routine and ad hoc inspection activities in the DPRK in late September and October, and that if that inspection did not begin by the time specified, the DPRK would be 'widening the area of non-compliance and the continuity of important safeguards data would be broken'. On 23 September, the Board resolved to bring the matter to the attention of the General Conference. Calling this decision a violation of its sovereign rights, the DPRK responded by calling off the consultations with the IAEA that had been planned for early October, expressing the view that the matter could be usefully discussed only in bilateral talks with the United States, and raising the possibility that it would be compelled to reconsider even the limited inspection access it had granted the IAEA.

The inclusion of the issue of the implementation of the safeguards agreement between the DPRK and the IAEA in the agenda of the General Conference followed a procedural discussions during which the question of the propriety of inclusion was confirmed by 69 votes to 1 (DPRK) and 10 abstentions (including China); the decision to waive the requisite time limit was taken by the same distribution of votes. Finally, with 72 votes in favour, two against (DPRK and Libya) and 11 abstentions (including China, Bangladesh, India and Pakistan) the General Conference adopted a resolution in which it,

> 1. Strongly endorse(d) the actions taken so far in this regard by the Board of Governors and commend(ed) the Director General and the Secretariat for their impartial efforts to implement the safeguards agreement (INFCIRC/403) still in force between the Agency and the Democratic People's Republic of Korea (DPRK);
>
> 2. Expresse(d) its grave concern that the DPRK had failed to discharge its safeguards obligations and ha(d) recently widened the area of non-compliance by not accepting Agency ad hoc and routine inspections as required by its safeguards agreement with the Agency;
>
> 3. Urge(d) the DPRK to co-operate immediately in the full implementation of the safeguards agreement; and
>
> 4. Decide(d) to include in the agenda for its thirty-eighth regular session an item entitled 'Implementation of the agreement between the Agency and the Democratic People's Republic of Korea for the application of safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons'.

During the lengthy debate in the Plenary a large number of delegations stressed the gravity of the DPRK's non-compliance and the negative precedent that would be set if the Conference failed to express its condemnation thereof. Some other states, notably China, expressed the view that a solution should be sought in three sets of patient consultations and negotiations among the four parties directly concerned: DPRK/USA, DPRK/RoK, and DPRK/IAEA; a condemnation, on the other hand, would jeopardise the progress that had been made already. The DPRK rejected the 'unjust decision' and warned that the IAEA would have to bear responsibility for its consequences. (**GC(XXXVII)/1052/Add.1**, 24 September; **(GC(XXXVII)/1084** and **1084/Add. 1**, 26 September; **IAEA Press Release** PR 93/18, 27 September; **GC(XXXVII)/1090**, 30 September; **direct information**)

- Under the agenda item 'The Implementation of Security Council Resolutions 687, 707 and 715' the General Conference took note of reports by the Director General on the **Agency's activities in Iraq** since the thirty-sixth regular session of the General Conference, and the technical talks that had taken place at UN Headquarters in New York between delegations of the IAEA, the United Nations and Iraq. As far as the IAEA was concerned, according to the latter report, there were still areas where clarification was needed, notably on the foreign suppliers of specific items used in the programme prohibited by resolution 687 (1991) and the identification of the source(s) which provided Iraq with technical advice. Iraq, which could not vote but participated in the debate, questioned the Conference's competence to discuss this matter. When the Conference, in a roll-call vote of 68 in favour, one against (Jordan) and three abstentions (Algeria, Cuba and DPRK), decided that it did have that competence, Iraq tried in vain to have the draft resolution amended. Finally, by 74 votes in favour and four abstentions (Algeria, Cuba, DPRK and Jordan) the Conference adopted a resolution in which it,

> 1. Demand(ed) that Iraq immediately and fully comply with all of its obligations under relevant Security Council resolutions, including the requirement under Security Council resolution 707 that it submit a full, final and complete declaration of Iraq's nuclear programme which includes all information called for by Security Council resolution 687, particularly on outstanding questions about the foreign suppliers of specific items used in Iraq's nuclear programme and the sources which provided Iraq with technical advice, and including acceptance of the Plan for Future Ongoing Monitoring;
>
> 2. Commend(ed) the Director General and his staff for their strenuous efforts in the implementation of Security Council resolutions 687, 707 and 715, in particular the detection and destruction or otherwise rendering harmless of equipment and material which could be used for nuclear weapons and ask(ed) them to continue their efforts;
>
> 3. Request(ed) the Director General to continue his efforts to put in place the necessary measures of the Plan for Future Ongoing Monitoring, in accordance with Security Council resolution 715; and
>
> 4. Request(ed) the Director General to report the views of the General Conference to the Secretary-General of the United Nations and to report to the Board of Governors and to the thirty-eighth regular session of the General Conference on his efforts to implement Security Council resolutions 687, 707 and 715 and decide(d) to remain seized of this issue.

(**IAEA Document GOV/2677-GC(XXXVII)/1069**, 26 August; **Gov/2677/Add.1-GC(XXXVII)/1069/Add.1**, 16 September; **GC(XXXVII)/INF/326**, 24 September [request by Iraq for the restoration of its right to vote in the General Conference, which was not granted — Ed.]; **GC(XXXVII)/1091** and **Add.1**; **direct information**)

- On the issue of '**Application of IAEA Safeguards in the Middle East**' the General Conference had before it the report of the Director General on the studies undertaken in this area by the IAEA and on states'

comments on the obligations, verification requirements and modalities described in the Director General's 1992 report. Discussions resulted in a resolution which, after consultations between the sponsors, who sought the inclusion of a reference to the need for all states of the region to accept the NPT, and those who preferred to diffuse the issue in order to arrive at a consensus,

.....

2. Affirm(ed) the urgent need for all States in the Middle East to forthwith accept the application of full-scope Agency safeguards to all their nuclear activities as an important confidence-building measure among all States in the region and as a step in enhancing pace and security in the context of the establishment of a nuclear-weapon-free zone (NWFZ);

3. Call(ed) on all parties directly concerned to consider seriously taking the practical and appropriate steps required for the implementation of the proposal to establish a mutually and effectively verifiable NWFZ in the region, and invite(d) the countries concerned to adhere to international non-proliferation regimes, particularly the nuclear non-proliferation regime, as a means of complementing participation in a zone free of all weapons of mass destruction in the Middle East and of strengthening peace and security in the region.

.....

The resolution was adopted by consensus and it may be noted in this context that the Report of the General Committee on the Examination of Delegates' Credentials, which, *inter alia* recorded reservations by Arab states in respect of credentials submitted by the delegation of Israel, was also duly accepted. (**GOV/2682-(GC(XXXVII)/1072**, 6 September; **GC(XXXVII)/1086**, as revised, 30 September; **GC(XXXVII)/1098**, 30 September)

- Under the agenda item **'The Denuclearization of Africa'** the Director General had reported on the Agency's verification activities in South Africa. The report referred extensively to South Africa's nuclear-weapons programme and noted, among other things, that all the highly enriched uranium provided by South Africa's Atomic Energy Commission (AEC) to that programme had been returned to the AEC and was subject to Agency safeguards. It also stated that the Agency's inspection team, assisted by nuclear weapons experts, had carried out an assessment of the status of South Africa's former nuclear weapons programme and had found no indication to suggest that there remain any sensitive components of the programme which have not been either rendered useless or converted to commercial non-nuclear applications or peaceful nuclear usage. The General Conference adopted by consensus a resolution in which it, *inter alia*, requested South Africa 'to continue its stated policy of full transparency' and 'commended the African States in their efforts [*sic*] towards the establishment of an African Nuclear-Weapon-Free Zone' and requested the Director General to continue to assist them. In his comment, the South African delegate expressed his 'considerable disappointment' at the inadequate reflection of the situation, suggesting that the resolution should have invited his country to resume its full participation in the work of the IAEA. (**GC(XXXVII)/1075**, 9 September; **GC(XXXVII)/1088**, 29 September)

2. Safeguards

- The General Conference took note of a report by the Director General, made at the thirty-sixth regular session, on the actions taken to strengthen the effectiveness and improve the efficiency of the safeguards system. One of the steps taken was a decision of the Board to call on all parties to comprehensive safeguards agreements to provide to the Agency as early as possible, information on decisions to construct, to authorize construction or to modify a nuclear facility. Secondly, the Board had endorsed a reporting scheme under which member-states would provide, on a voluntary basis, information about exports, imports and inventories of nuclear material and imports of specified equipment and non-nuclear material in addition to the information required under existing safeguards agreements. The Board had also invited States to provide information on their production of nuclear material. The Standing Advisory Group on Safeguards Implementation (SAGSI) had identified a number of measures, including environmental monitoring and a freer access to sites that would enhance the Agency's ability to detect undeclared facilities and activities, and recommended that these measures be further developed and implemented as a matter of priority. It also recommended the introduction of other new techniques, procedures and technologies to increase the cost-effectiveness of current safeguards approaches and identified alternative safeguards approaches that might improve cost-effectiveness. As one way of reducing costs and improving cost efficiency, a new partnership approach had been established with Euratom, which it is hoped will save 1,000 person-days of inspection (PDI) by the end of 1993, and which, when fully implemented, should result in total savings of about 2,000 PDI. Many speakers in the debate expressed support for the various steps taken and proposed, which some saw in the context of proposals for new Agency tasks in the safeguarding of nuclear material from dismantled weapons, as well as with regard to a possible cut-off of the production of weapon-grade fissile material and the adoption of international measures for the management of stockpiles of highly enriched uranium and plutonium. There were some reservations, however. China said that in improving the safeguards system the views of the majority of states should be taken into account; any 'biased use of the system', to 'exert pressure' on states was inappropriate. It warned that safeguards should be objective, should not be 'manipulated by a few countries' and any 'wilfully intensified supervision to some countries or deliberately simplified monitoring on others' would be detrimental. Some states, including Mexico, said that new approaches would require a new legal framework and called for the establishment of an open-ended committee for that purpose. (**GC(XXXVII)/1073**, 6

September; **GC(XXXXVII)/1096, Rev.1**. 1 October; **statements** at the General Conference)

h. Peaceful Nuclear Developments

- In light of its disastrous energy shortage, **Armenia** is said to consider restarting at least one of its two VVER-440/230 power reactors, which were shut down after the earthquake of 1988, even without holding the referendum which its parliament decided in 1991 should precede any such move. The alternative, of using water from Lake Sevan for hydroelectric energy production would have very serious environmental consequences and would deprive a large part of the population of a reliable source of drinking water. Western experts have criticised the instrumentation and control and the reactor protection systems of the Armenian power plant, but since replacing those would reportedly cost several hundred million dollars, this is not expected to be done. In August, a group of IAEA officials visited Armenia at the request of its government. The head of the delegation, Assistant Director General Morris Rosen, has reportedly said that the IAEA would assist Armenia if it decides to reactivate the plant. (**Nucleonics Week**, July 15; **The New York Times**, August 17; **Yerevan News Agency**, 25 August)

- Brazil plans to complete the Angra-2 nuclear plant, of which construction was stopped five years ago; reportedly, the government has decided that finishing the facility is the most economical solution. The reactor is scheduled to start commercial operation in 1998 (**O Globo** [Rio de Janeiro], 23 June, in **JPRS-TND-93-020**, 28 June; **Süddeutsche Zeitung**, 28 September)

- **China** plans to construct a nuclear power plant in the island province of Hainan. Initial plans call for the construction of one 350-MW unit to start with, and a second later. At Qinshan in Zhejiang province a 300-MW PWR of indigenous design was completed in 1991 and started operation in May, 1993; two 600-MW units are planned for completion in 2000. The second Chinese power reactor to be completed, a 950-MW PWR plant of French design at Daya Bay, in Guangdong province, went critical on 28 July and first supplied current to China's electric grid on 31 August. The manufacturer expects full commercial operation at the end of the present year. Another unit is about six months behind. Two Russian VVER-1000 (1000-MW PWRs) are to be built in Liaoning province. (**Ens NucNet News** No223/93, 10th June and No286/93, 29th July; **Nucleonics Week**, August 5, September 9)

- Plans of the **Czech Republic** to complete the two VVER-1000 units at Temelin are resisted by environmentalists. *Greenpeace* is lobbying the U.S. Export-Import Bank to require an environmental assessment before releasing funds for the project, for which the American firm of Westinghouse is the contractor. The Prime Minister of Austria, interviewed by a major Prague daily, stated that his country would 'never' accept the Czech decision. (**Die Presse** [Vienna], 25 August; **Nucleonics Week**, September 2)

- In **Finland**, the debate between those who support the use of nuclear energy and the supporters of the use of natural gas has ended in the decision not to build a fifth nuclear reactor. The decision is seen as a serious blow for the future of nuclear energy as a power source in Northern Europe. The possibility that Finland will now have to take recourse to the large-scale use of coal-fired power stations is said to be increasing, but the country's utility companies are said to keep their options open. (**Nucleonics Week**, August 12, September 30; **Ens NucNet** No. 342, 24th September; **Financial Times**, 25 September; **Die Presse**, 27 September)

- France's 250-MW prototype breeder reactor Phenix may be restarted once a series of additional safety measures have been taken, most of which are said to be relatively easy to achieve. Phenix, which first went critical twenty years ago, now is the only operating fast reactor in Western Europe. The relicensing of the 1,240-MW Superphenix is held up by a delay in the submission of the report on the public inquiry that was held in the Spring of this year. The delay is seen as playing into the hands of opponents to the plant, who are protesting the restart (**Nucleonics Week**, September 9)

- In **Germany**, the Social Democratic Party has announced that it will not go along with the construction of any new power plants before the year 2000 and will insist on all present reactors being gradually phased out. The Administrative Court in Hesse has invalidated the construction licenses for the almost completed mixed-oxide (MOX) fuel production plant at Hanau, on the ground that they were granted in violation of safety-related legislation. The decision is said to raise serious doubt about the prospects for Germany's plutonium-recycling programme. The plant would have used plutonium produced in German reactors and extracted in British and French reprocessing plants. The decision may be appealed but there is a question whether industry would be able and willing to bear the high cost of keeping the plant idle pending the outcome of the appeal, especially since the MOX project is politically controversial, and German electricity producers have let it be known that they will not support the use of plutonium in power production unless there is a political consensus in its favour.

  A bomb threat against the 1,316-MW Kruemmel power station has resulted in tightened security there.

  The German Government is reported to plan sending plutonium fuel fabricated for the fast breeder reactor that was to have been built at Kalkar by air to Scotland, for temporary storage. Opposition politicians assail the plan as potentially dangerous. It is noted that at its summer session in Strasbourg, the European Parliament called for a prohibition on air shipments of plutonium in the area of the European Community. (**Reuter's Information Services, Inc.**, July 22; **Nucleonics Week**, July 22, 29, August 12; **NuclearFuel**, July 5, August 2)

- **India**'s Atomic Energy Regulatory Board has concluded that the fire of last March at Narora-1 was caused by the shearing of a turbine blade, and has

ordered the nine pressurised heavy water reactors that have turbine generators of the same manufacture to be shut down one by one for inspection of the turbines and generators.

India's nuclear programme is said to suffer under an inability to obtain many spare parts and equipment items as a result of India's refusal to submit its nuclear activities to comprehensive IAEA safeguards. This led **France** to refuse to make further deliveries of low-enriched uranium for the US-supplied Tarapur power station. The agreement with the **United States**, under which France has been supplying uranium, expires on 23 October and France recently delivered the last fuel load it can sell to India. There is a report that **Kazakhstan** had said it would be ready to supply the fuel, but this would require Russian cooperation, which is not expected. India is reportedly planning to run Tarapur for another fifteen years on mixed-oxide (MOX: fuel containing plutonium and uranium) fuel, which would be manufactured at the Bhabha Atomic Research Centre (BARC) at Bombay. Its nuclear authorities claim that they will have the right, after the agreement has run out, to reprocess irradiated Tarapur fuel without America's consent. Washington maintains, however, that the rule of 'prior consent', which was part of the agreement, remains valid also after the expiration date, and has warned New Delhi that it would react 'very sharply' if it recycled spent fuel from Tarapur without America's consent. According to an American diplomat quoted in the press, such consent is not likely to be given under the existing U.S. domestic law, but it now seems that a three-day meeting in September between Indian and United States officials may have led to an interim solution. The Indian move to request the IAEA to continue its safeguards on the plant also after the expiration of the agreement with the United States is seen in this context. The Agency's Board of Governors was expected to consider this request at its session of early October.

Funding cuts by the Indian government are said to have slowed down the nuclear energy programme to the point where India - which until recently had to buy heavy water abroad, for lack of indigenous production capability - now has a surplus of that material and is considering exporting it. It is apparently talking with Seoul about supplying heavy water for Canadian Candu-type reactors in South Korea, and is also said to hope to sell heavy water to Argentina for Atucha-2. The cuts in the Indian nuclear energy budget are seen to have a particularly negative impact on the fast-breeder programme. The Atomic Energy Commission had wanted to build three 500-MW fast breeder reactors by 2000, but the budget plan for 1992–97 makes no provision for this.

The first unit of the Kakrapur power station, which recently started operation, uses thorium fuel bundles; the second is in an advanced state of commissioning. An engineering-scale facility to extract U-233 from thorium is being set up, to be followed by larger plants. India is ready to export various research reactors, including a 5-10MW natural-uranium reactor and an experimental 30KW reactor operating on U-233; any such export would have to be subject to IAEA safeguards. (**Agence France Presse**, 9 June, in **JPRS-TND-93-018**, 14 June, 8 July, in **FBIS-NES-93-130**, 9 July; **The Hindustan Times**, 11 June, and **Indian Express**, 17 June, both in **JPRS-TND-93-020**, 28 June; **United Press International**, **Reuter's** and **Christian Science Monitor**, July 7; **Financial Times** and **Süddeutsche Zeitung**, July 10/11; **The New York Times**, July 13; **Nucleonics Week**, July 15, 29; **ITAR-TASS** [Moscow], 20 July, in **JPRS-TND-93-024**, 27 July and 24 July, in **JPRS-TND-93-025**, 2 August; **Sunday** [Calcutta], 18-24 July; **Moscow Radio Rossii Network**, 24 July, in **JPRS-TND-93-025**, 2 August; **NuclearFuel**, August 2; **Nuclear Engineering**, September; **The Hindu**, September 14 and 30; **The Statesman**, 14 September; **Statement to IAEA General Conference** 29 September; **The Hindustan Times**, 30 September)

- Indonesia has announced that it plans in 1995 to call for tenders for the construction of the first of two 600-MW power reactors in Northern Java; the unit should be ready by 2000. Reportedly, western industrialists have expressed doubt that the project would be economical, politically acceptable and capable of attracting necessary funds. One comment is also that the preference for small 600-MW units excludes many manufacturers, notably the French. Indonesian environmentalists are also said to be opposed. (**Nucleonics Week**, September 9; **Enerpresse** No. 5900, 2 September)

- An earthquake in the Northern part of **Japan** which registered 7.8 on the Richter scale did not cause damage to the 27 power reactors, the nuclear fuel cycle complex or any of the nuclear research facilities in the area.

  Approval has been given for the development of a new power station at Suzu, consisting of one 1350-MW Advanced Boiling Water Reactor and one Advanced Pressurised Water Reactor, to be on line by 2006, and for the construction of five additional units at three existing power stations: three 1100-MW BWRs at Higashidori, to be ready in 2004 and 2005, an 825-MW BWR at Onagawa, to start operation in 2002, and a 1350-MW BWR at Shika, targeted for 2005.

  The criticality date of the Monju prototype fast-breeder reactor, last set for October, has had to be delayed until April 1994, as the result of a malfunction in the mixed-oxide fuel pellet sintering furnace, which needs extensive repairs. Japan's nuclear authorities are opening the facility as an international centre for research and development on fast breeder reactors.

  In the Lower House elections on 18 July, the antinuclear Social Democratic Party lost almost half its seats in Parliament. The parties that make up the new government coalition are expected to continue supporting the extension of Japan's nuclear effort. (**Atoms in Japan**, Vol. 37, No. 6, June, No. 7, July, No. 8, August; **ENS NucNet**, *News* No256/93, 2nd July, *Insider* No40, 8th July; **Nucleonics Week**, July 15, 22, August 5; **NuclearFuel**, July 19; **Yomuri Shimbum**, 31 August)

- Lithuania continues operating its two 1,500-MW RBMKs at Ignalina at about half their rated capacity, to supply just under 50% of the country's electricity. Shortly after independence, it was decided to shut the station down, but although energy demand has decreased since and is expected to drop further, the station is now seen to be needed. As is apparently the case in other former Communist countries in Eastern Europe, with plant construction paid, or written off, continuing to operate nuclear plants for as long as possible is seen as economically preferable to replacing them by conventional power stations, which would demand new capital outlay and bring high hard-currency cost for fossil fuels. A comprehensive safety plan for the station has been adopted and Lithuania is asking the European Bank for Reconstruction and Development for financial assistance to complement the approximate $5-million it will pay for improvements, and the $7-million worth of assistance Sweden has promised to provide. At the request of the Lithuanian government, experts from Finland, Germany, Russia, Sweden, Ukraine and the European Community are forming a nuclear safety committee for the two Ignalina reactors. As the country has not yet signed the international instruments nor adopted legislation that would limit contractors' liability in the case of off-site accidents, companies are currently unwilling to work on backfitting the reactors. This is said to be the reason why, while a number of critical welding faults in pressure tubes have been repaired at Ignalina-2 with Swedish help, the Swedish supply of replacement parts of the pressure system of Ignalina-1 has been put off for now. On the other hand, Canadian and German bidders for the job of constructing an interim storage facility for spent fuel would reportedly be satisfied with government indemnities for that work, because they consider that handling spent fuel does not involve high safety risks. (**Nucleonics Week**, July 22, August 26, September 2; **The Economist**, July 24th).

- Pakistan is reported to plan expanding its enrichment plant at Kahuta to produce low-enriched (5%) uranium to be used as fuel in the 300-MW power reactor under construction at Chasma, with the help of China. The first concrete for the reactor was ceremoniously poured on 1 August, in the presence of senior government officials and representatives of industry from both countries. Pakistan hopes to design and build a second unit at the site, on which work would start in 1994/5. (**Financial Times**, 10/11 July; **Nucleonics Week**, August 5)

- **Russia**'s nuclear power plant managers are said to spend much of their time trying to raise loans with which to pay staff and conduct routine maintenance. The lack of financial means is reportedly due to delays in payments for supplied power, as the result of a deliberate policy of the utilities, which profit from Russia's high inflation rate to reduce the value of money owed. A similar problem is noted in Lithuania — see above — where the manager of the Ignalina power station is said to calculate that since the beginning of the current year the state electricity board has paid 40% of its bill. (**Nucleonics Week**, July 15; **The Economist**, July 24th)

- **Russia** plans to continue developing RBMK channel-type reactors. Eleven RBMKs are at present operating in Russia; three are under construction. The Ministry of Atomic Energy claims that the performance of its old RBMK-1000 and VVER-440 model reactors is better than that of the newer VVER-1000s. The performance of the latter category of reactor is reportedly affected by problems with the steam generators, which are subject to corrosion and are being replaced. (**Nucleonics Week**, July 8)

- The operator of **Sweden**'s oldest nuclear power plant, the 462-MW Oskarshamn-1 BWR, which was commissioned in 1972 and was among five units ordered to improve their emergency cooling systems, is planning a major overhaul and modernisation of the plant. Antinuclear activists, however, who have called for the shut-down of one or more of Sweden's old reactors, were expected to disagree, and it is now reported that the Swedish Radiation Protection Institute and the Nuclear Power Inspectorate have expressed reservations about the plans, given the potential radiation risks involved. The Ringhals-2 unit is likely to remain closed until late autumn as a result of cracks found in a penetration weld in the vessel head. Barsebaeck-1, has been given permission to continue operating, after extensive modification of the emergency core cooling system. Barsebaeck-2 was due for refuelling in September, at which time a decision regarding a license for restart will presumably be made. Opposition parliamentarians from Sweden's Social Democratic party are demanding that the Government stick to the original decision to shut down all 12 nuclear power reactors by 2010. This view is reportedly shared by Sweden's minister for the environment and natural resources, who has demanded that at least one power reactor be decommissioned after the general election of next September, and that the date for the final phase-out be observed. A senior Swedish nuclear executive has expressed the view that a phase-out would be highly unlikely: it would require legislation providing for compensation to utility companies, and would have to meet the conditions that alternative power sources should be cost competitive and environmentally benign, and that it would not harm the national economy or employment in industry. The issue is expected to play a prominent role at the general election that will be held in 1994. (**Nucleonics Week**, August 12, 19, 26, September 16, 23)

- Turkey is said to be thinking of building a PWR power station on the Black Sea coast. In 1992, the Turkish government approved a nuclear power programme which calls for the first plant to be in service within eight years; it has reportedly since invited proposals from a number of companies and is now talking with Siemens AG. (**Nucleonics Week**, September 23)

- **Ukraine**'s parliament is expected to vote on an end to the moratorium on new construction of nuclear power plants. If the moratorium is lifted, three VVER-1000 power reactors now in an advanced stage of construction would be completed. Earlier, there was a report that Ukraine had decided to have the fuel irradiated in its VVER-1000s reprocessed; to this end it would help finance completion of the Russian RT-2

reprocessing facility at Krasnoyarsk-26. There now appears to be some question whether it will be able to do so. Meanwhile, it appears that Ukraine is running out of storage space for irradiated fuel, as a result of Russia's refusal to honour old commitments to take back spent fuel, reprocess it and provide fresh fuel for Ukrainian reactors. The situation may well force Ukraine to shut down several reactors until it is resolved. (**Nucleonics Week**, July 15; **NuclearFuel**, July 19, September 27; **direct information**)

- In the **United Kingdom** the decision to open British Nuclear Fuel's thermal oxide reprocessing plant ('THORP') at Windscale is said to be near. After another series of consultations on the justification for operating the plant the two ministries involved say they are inclined to give BNFL the eventual go-ahead to operate. The final decision does not seem to be expected until December, however. While authorities consider the wider questions raised over the economic and political justification for the plant not legally relevant to the proceedings, a nine-week public consultation period has been initiated as part of the stated policy of 'good governance'. Many environmentalists in Britain remain adamantly opposed to the plant and call the latest consultation a 'sham' and insist the need for THORP should be established in terms of 'overall benefit'; *Greenpeace* is threatening to challenge the procedure in court. The Pollution Inspectorate, reputedly against the advice of local inspectors, has given permission to start low-active unirradiated uranium commissioning; an attempt by *Greenpeace* to halt this testing activity has been rejected by a High Court judge. Allegedly prompted by a report of the US General Accounting Office about Japan's growing stockpile of plutonium, Liberal Democratic members of Parliament have asked for a public inquiry into the economic justification for THORP and Britain's role in providing Japan with plutonium that could be used for nuclear weapons. Minister Gummer has put off giving planning approval for a mixed-oxide (MOX) manufacturing facility at Sellafield, pending further consultations. On 7 September, a leak of non-radioactive nitrogen dioxide gas, supposedly unconnected to the low-active commissioning run, necessitated 300 workers to be briefly evacuated. (**EnsNucNet**, 8th July, 29th September; **The Times** [London], 8 July, 26 August, 4 September; **New Scientist**, 10 July; **The Observer**, 18 July; **The Independent**, 22 July, 5 and 26 August, 2 September; **Nucleonics Week**, July 22, August 12, September 9; **NuclearFuel**, July 5, August 2, 16; **Daily Telegraph**, 5 and 26 August, 2, 3, 4 and 28 September; **Financial Times**, 5 August, 2, 3 and 4 September)

- Speculation is continuing in the **United States** about the identity of the company which reportedly intends to build a 900-MW nuclear power plant in Arizona, supposedly to supply power for sale to utilities, not directly to consumers. The projected power range adds to the mystery, since it does not seem to point to a known US design, and no foreign reactor vendor has come forward as a potential supplier.

  On 14 August, the clean-up at the Three Mile Island No. 2 power reactor, where in March 1979 the reactor core was damaged as a result of a malfunction of the cooling system, was completed. The cost of the job, which took almost nine years and is said to have involved 20,000 people in all, is estimated at around $1-billion.

  As the likelihood of the establishment of an underground repository for radioactive wastes from power plants, at Yucca Mountain, Nevada by 2010 appears to diminish, the American nuclear power industry seems to have come to the reluctant conclusion that in the short term a temporary storage site will be needed. Press reports mention the interest of Native American tribes in New Mexico and in Utah in leasing their land for that purpose. (**Nucleonics Week**, July 22; **The New York Times**, August 15, 27; **Der Spiegel**, 23 August)

i. Events in Nuclear-Weapon States

- A forthcoming book on the Persian Gulf War, to be published in the United States in October, claims that a US airforce general suggested using tactical nuclear weapons against 18 Iraqi biological-weapon sites, but that this was ruled out by Chief-of-Staff Gen. Powell. (Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, Houghton Miflin, New York, 504 pp., reviewed in **The Washington Post National Weekly Edition**, August 2-8)

- **United States**: Workers at the Hanford Nuclear Reservation in Washington State have managed to install a pump in the biggest underground holding tank for radioactive waste from nuclear-weapon production, which, by helping to release hydrogen produced in the waste, should reduce the risk of explosion, which in this tank (one of 177 at the site) is considered particularly high. All but essential safety and maintenance work at the plant has been halted, however, after two potentially serious incidents arising from unauthorised actions by employees in disregard of safety rules. In one instance, a worker who tried to check whether a near-by drain was blocked suffered radioactive contamination. The personnel involved were sent home without pay, pending retraining; some have been dismissed. So far, $4 billion is estimated to have been spent on clean-up work at Hanford. The work appears to be slowed by such factors as uncertainty how to handle the great amounts of waste in the tanks, an apparent lack of clear ideas about the size and objectives of a planned waste-vitrification plant, and the as yet unanswered question how the radioactive waste is to be moved from the tanks. (**The New York Times**, July 11, August 15; **The Economist**, August 21st)

- In the **United States** an agreement has been worked out between the State of Idaho and the US Navy under which the latter is allowed to store 19 containers of spent fuel from propulsion reactors at a site near Idaho Falls. More may be stored if the Secretary of Defense formally states that national security demands it — which is said to be likely before 1995. (**The New York Times**, August 10)

- Personnel of **United States** national laboratories involved in the development and testing of nuclear weapons, and their counterparts from the research institutes of the **Russian Federation**, at Arzamas-16 and Chelyabinsk-70, have been discussing cooperation

on conversion. Officials at the US Departments of Energy and Defense are reportedly concerned, however, that scientists from the two countries might make common cause to continue weapons testing and restrict the flow of information from the weapons laboratories. The funds made available for nuclear conversion in the former Soviet Union, by the United States, the European Community and Japan, through the International Science and Technology Centre, near Moscow, cannot be used until the Centre is approved by the Russian Parliament, where political hardliners and academicians are said to block its creation. (**NuclearFuel**, August 2)

- An investigation has begun in the **United States** about allegations made by former Reagan officials, that in 1984 a fake missile interception was staged to convince the USSR that the American space-defence programme was progressing and to persuade it to spend its resources on countermeasures. The exercise, which also seems to have persuaded the US Congress to allocate more funds for the strategic defence initiative, is said to have been approved at a high level. Former defence secretary Weinberger has denied any deception and said that the event was a successful test of a space interception vehicle. A retired Army General overseeing the test also said that it was not 'rigged', but acknowledged that the target was artificially heated to make it more 'visible' to the intercepting missile; he conceded that something more might have been done to the target of which he was not aware. Experts involved in the missile-defence programme insist that the target was equipped with electronic devices that made it easier to find and destroy and also had explosives on board to enhance the effect of the impact. (**The New York Times**, August 18, 19, 27; **Newsweek** and **Time**, August 30)

j. Events in the Commonwealth of Independent States

- According to recent authoritative reports from **Russia** that country's nuclear arsenal is much greater than generally assumed. It now appears that the number of Soviet warheads seven years ago stood at 45,000, which is 12,000 more than generally believed, and twice the number held by the United States. The stock of highly enriched uranium is now thought to be 1,200 tons, i.e. about twice the amount Russia was thought to have; one question raised in the United States is whether it should raise its offer to buy Russian HEU accordingly, from the 500 tons which it earlier proposed to purchase. (**The New York Times**, September 26; **The Guardian**, **Daily Telegraph**, **Südeutsche Zeitung** and **Frankfurter Allgemeine Zeitung**, 27 September; **Nucleonics Week**, September 30)

- It has been announced in Moscow, in connection with the current political troubles, that President Yeltsin has remained throughout in control of Russia's nuclear arsenal. (**The International Herald Tribune**, September 23)

- Nuclear scientists and technicians in **Russia** are seen to be in the forefront of protests against deteriorating living conditions for scientific personnel in that country. Russian nuclear specialists, including those engaged in weapon dismantling, are said to feel badly treated by the authorities. The end of the privileges which staff employed in nuclear complexes such as Chelyabinsk-70 (now known as Sneschinsk) and Arzamas-16 used to enjoy reportedly causes resentment. Sometimes, salaries have been paid late or not at all. Labour unions at both nuclear centres are threatening to strike if conditions do not improve. The situation is said to jeopardise weapon-dismantling operations and raise a risk of accidents as a result of inadequate supervision. Press reports see a growing likelihood of nuclear materials being sold abroad, and of nuclear scientists and technicians trying to find employ elsewhere. Funds made available by the US as an incentive to keep scientists from offering their services to third countries appear to be held up in the Russian parliament. (**Die Welt** and **Süddeutsche Zeitung**, 7 July; **The New York Times**, July 11; **Reuter's**, July 22; **Die Presse**, 23 July)

- Relations between nuclear authorities in **Kazakhstan** and **Russia** are said to be troubled by a variety of disagreements relating to the operation of the nuclear establishment at Semipalatinsk-21. Russian scientists employed at the institute are said to complain about low pay, and bad treatment by their Kazakh colleagues; the Kazakh authorities apparently want Russia to take charge of the huge quantities of radioactive waste generated by its military nuclear programme. Although the Semipalatinsk testing site was closed at independence, there now seems to be some idea of holding a demonstration there of the use of a 'peaceful nuclear explosion' to destroy toxic waste, by the Russian 'Chetek' company which appears to be still active, although it had been understood to have promised to terminate its PNE efforts. (**Nucleonics Week**, August 5; **direct information**)

- There is some disagreement about recent findings that would indicate that plutonium leaks from the two nuclear torpedoes of the Soviet submarine *Komsomolets*, which sank in 1989, 300 nautical miles from the Norwegian coast in waters one mile deep, may pose less direct risk to nearby fishing grounds than had been feared. A report issued in Russia in April, about the disposal at sea of various radioactive objects, including naval reactors, indicated that the composition of the metals in the torpedoes makes them susceptible to corrosion in seawater, so that sooner or later leakage of plutonium might be expected. Previous studies had shown that it was unlikely that *Komsomolets* could be raised in one piece, since it appears to have a large hole in one side from an explosion in the torpedo compartment; if it could be done, cost estimates range around $500 million. The alternative of bringing only the torpedoes to the surface would reputedly cost around $150 million. Consideration was also given to the possibility of sealing the wreck or its radioactive components in foam or concrete. A month-long investigation carried out in the summer of 1993, by scientists from the Netherlands, Norway, Russia and the United States, using remotely controlled submarines operating from the Russian research ship *Akademik Keldysh*, equipped with sensors and robots for deep-sea investigations, has reportedly determined that the currents around the wreck of the *Komsomolets* are weaker than previously believed, so that any released

radioactivity would lie on the sea floor rather than being swept towards the fisheries. Russian authorities, however, continue to express concern about the possible spread of radiation from the wreck. They have now reportedly decided to seal the nuclear torpedoes within the next two years, starting in the summer of 1994, with or without Western assistance; no details have been given of the procedure to be used. This has become a contentious issue. Western scientists claim that Russia is stirring up concern in order to get help for a cleanup of the areas where they have dumped nuclear substances; their Russian colleagues contend that the Americans play down the situation to divert attention from the nuclear reactors and bombs lost at sea. Recently, a Norwegian-Russian expedition also visited the site of the wreck, and some of those involved have voiced concern that within several years plutonium might start leaking out of the warheads of the torpedoes. This enterprise is apparently also concerned more generally with the consequences of the disposal of nuclear material from Russian naval vessels and the former Soviet practice of dumping discarded propulsion reactors at sea. Norwegian experts have reportedly been allowed to visit the Russian military base at Novaya Zemlya, *inter alia* to discuss the question of storage of spent fuel from submarine reactors. Some American scientists who had expected to embark on the Russian research vessel *Dimitri Mendeleyev*, to measure radioactive contamination in the Arctic as part of an international survey of the Kara and Barents seas, were left at dockside when they refused to accept restrictions on the area they could study that would presumably have prevented them from doing the research they had agreed to undertake. A recent Russian study is said to show that there are no radiation health grounds for salvaging the marine propulsion reactors that have been dumped at sea. A report sponsored by the government of Japan similarly states that the dumping of Russian radioactive waste into the Japan Sea has not so far had an effect on the health of the Japanese people. The Political Declaration of the Group of Seven, adopted in Tokyo in July, emphasizes the 'concern' of the seven major industrial nations over the ocean dumping of radioactive waste by Russia. (**Atoms in Japan**, Vol. 37, No. 7, July; **Reuter's**, July 24; **The New York Times**, August 1, September 5, 19; **Nucleonics Week**, August 5; **Nature**, 2 September; **New Scientist**, 4 September; **International Environment Daily**, September 17)

k. Developments of Concern for Horizontal Proliferation

- A former navy minister in the government of **Brazil** has said in a magazine interview that during the dictatorship of Gen. Figueiredo (1979-1985) his country had complete plans for the construction of a nuclear weapon; he ascribed the fact that these plans were not realised to a lack of funds and political will. (**O Globo**, [Rio de Janeiro], 29 July, in **JPRS-TND-025**, 2 August; **Süddeutsche Zeitung**, 2 August)

- Allegations in the Israeli press that several major **Swiss** companies have supplied **Iran** with a range of dual-use products suitable, among other purposes, for the production of nuclear weapons, have been denied in Switzerland and by Israel's Prime Minister Rabin. The **United States** has urged European Community members to restrict sales of high-technology products to Iran, on the grounds that it aims to develop weapons of mass-destruction, including nuclear weapons, and their means of delivery. (**Wall Street Journal** and **Financial Times**, 10 June; **Tribune de Genève**, 26\27 June; **The Jerusalem Post**, 27, 30 June)

- **Iraq** is seeking to persuade the United Nations that it is complying with the armistice terms agreed at the end of the Persian Gulf War, so as to obtain a relaxation of the UN-imposed sanctions against it, notably the ban on oil sales. Until recently, however, the UN Special Commission was not yet satisfied with Iraq's activities in this regard, nor was it fully convinced of Baghdad's willingness to comply with plans for the long-term monitoring of its weapon-related activities. In particular, although Iraq has repeatedly promised to do so, it still has not made full disclosure of the foreign firms that have supplied it with material, equipment and technology for its programme to make weapons of mass destruction and their means of delivery. (Twenty or more countries are believed to have supplied Iraq with technology and equipment for its nuclear and missile programmes. Among these, Germany is said to be responsible for about half of the supplies, Switzerland for 8%, Italy and France for 5% each, Brazil for 4%, the UK and the US for about 3.5% each, Austria for 3%, Argentina and Egypt each for 2.5%, Belgium and the USSR for 2% and a number of other states for smaller percentages.) There are reports that Brazil was involved in Iraq's centrifuge-enrichment activities, specifically by supplying maraging steel for the production of centrifuges, and carbon fibre centrifuge rotors, supposedly with assistance from the Banco Nazionale del Lavoro. IAEA officials are said to be puzzled by reports of a shipment of 1.4 tons of thorium supposedly destined for Iraq having been stopped by Brazilian authorities, since there had been no indications of Iraq ever being interested in developing a thorium fuel cycle. On the long-term programme to monitor Iraq's military industry under Security Council resolution 715 there is also as yet no agreement between the United Nations and Iraq: the latter has said it is ready to comply with future monitoring but not unconditionally. The Security Council sees the conclusion of a long-term agreement on this issue as another condition to be fulfilled before consideration can be given to easing the sanctions, and has stepped up its nation-wide investigations in an apparent attempt to make sure once and for all that Iraq's capacity to produce weapons of mass destruction and the means of delivering them has been disposed of. At the conclusion of an IAEA inspection in late June, which served among other things to arrange for the removal to Russia of about 40 kg of irradiated highly-enriched uranium fuel, the team's senior inspector, Robert Kelley, expressed the view that Iraq's nuclear programme was 'dead'; he rejected the possibility that it still had a secret plutonium-producing reactor. Mr. Kelley said, however, that Iraq's continuing hesitation in revealing the full list of its nuclear suppliers might mean that it wants to use these suppliers again, and that continued monitoring was essential because, given its experience, Iraq might be able to build a nuclear programme faster than other countries could. A subsequent IAEA inspection in July, reportedly intended mainly to catalogue dual-use machinery, once

again raised the prospect of an early disclosure of the suppliers' list. Meanwhile, Iraq is said to be engaged in a massive effort to reconstruct its armed forces. According to a report prepared for the Foreign Affairs subcommittee on international security of the US House of Representatives, it has rebuilt 80% of its military manufacturing capability and most if its damaged war material. While recognising that Iraq's nuclear programme has been virtually eliminated, American sources express the conviction that Iraq is determined to resume it at the first opportunity, using its own resources and foreign supplies. In the first week of July new problems arose over the implementation of the cease-fire agreement, when a team of United Nations inspectors were refused permission to install a monitoring camera at a missile test site, and had to be withdrawn from the country without having achieved their purpose. An Iraqi request to submit to the Security Council evidence of its compliance with the relevant resolutions, **before** the camera was installed was rejected. A few days later a new team of inspectors was dispatched to seal missile-testing sites, so that they would not be able to test missiles with a range over 100 miles; the Special Commission undertook to invite an Iraqi team to review compliance once that mission would be accomplished. Iraq persisted, however, in its demand to be given the opportunity first to show its progress in complying with the cease-fire conditions and to have UN sanctions lifted, and refused the new team access to the site. In response, the Security Council sent Amb. Rolf Ekéus, Executive Director of the Special Commission, to Baghdad, reputedly to advise the Iraqi authorities that the UN would not allow it to sell its oil until it had fully complied with the UN resolutions, and to demand that it permit the installation of cameras at the missile test sites, or allow them to be sealed, or dismantle them. Five days of talks, and repeated warnings of the possibility of further air strikes by the United States — reputedly not supported by Secretary-General Boutros-Ghali — ended with an interim solution under which Iraq concurred with the installation of cameras at two sites; these were only activated in late September, however. A press report that Iraq had begun to dismantle one test site has not been confirmed. In early October Amb. Ekéus is expected to resume his talks in Baghdad. Meanwhile, on 17 September a report to the Security Council stated that Iraq was still not in full compliance with the cease-fire terms. At about the same time, United Nations helicopters equipped with radiation-detection devices began sweeping the country in a search for undetected nuclear sites. (**Associated Press**, June 28, 30; **The Observer**, 27 June; **Wall Street Journal**, June 30; **Reuter's**, June 30, July 28; **Neue Zürcher Zeitung**, 1 July; **The Independent**, 5, 12 July; **The New York Times**, July 6, 7, 9, 11, 12, 13, 18 [article by Douglas Jehl, based on data from the **Wisconsin Project on Nuclear Arms Control**], July 20, September 6, 19, 27, 28; **Der Standard** [Vienna], 1, 8 July; **The Daily Telegraph**, 9, 14 July; **The Guardian**, 12 July; **The International Herald Tribune**, July 9, 14; **The Times** [London], July 12, 13; **The Financial Times**, June 28, July 5, 12, 13; **Süddeutsche Zeitung**, 26 June, 1, 15 July; **Frankfurter Allgemeine Zeitung**, 23 July; **The Washington Post**, August 6; **Wall Street Journal**, August 20/21; **Agence France Presse**, 23 August; **Nucleonics Week**, September 2; **United Nations Report**, September 24)

- The Chief of Staff of **Pakistan**'s army in 1988-1991 has been quoted in an Urdu-language newspaper published in London as saying that in 1987 his country had successfully carried out a nuclear test 'in cold laboratory conditions'. The report was denied in the Pakistani press, where Dr. Abdul Qadeer Khan, the person widely thought to have led Pakistan's programme for the production of weapon-grade material, is quoted as saying he had no knowledge of any nuclear test explosion. In another newspaper interview, former President Ghulam Ishaque Khan stated that his country's nuclear capacity three times kept India from attacking it. He is quoted as calling for continuation of the nuclear programme until the conflict with India over Kashmir has been resolved. Khan claims that the programme was continued against considerable US pressure, including an offer of $250-million, which Pakistan refused. However, in September caretaker Prime Minister Moeen Qureshi said that Pakistan had stopped its nuclear military programme at the point reached so far; he is quoted as saying that Pakistan was 'not working on making any nuclear weapons of any kind'. The statement, issued two weeks before the country is to have general elections, expressed the hope that the United States would now see its way clear to resume its economic and military assistance to Pakistan. Subsequently, a government spokesman added the clarification that Pakistan would not renounce the nuclear option unless India did so, and that it would not reverse its nuclear programme. Earlier, the news that Pakistan was planning to expand the capacity of its uranium-enrichment plant at Kahuta, in order to produce low-enriched fuel for the power reactor it expects to build with assistance from China, had been expected to put a further strain on its relations with the US — see above, **h. Peaceful Nuclear Developments**. In August, **Japan** released the $350-million technical assistance package to Pakistan, which it had held back for eight months in light of that country's nuclear activities. The decision is taken as reflecting Japan's recognition of Pakistan's position as more pragmatic than that of India. (**Financial Times**, 10/11 July; **The New York Times**, July 25, 26; **Le Monde**, 25-26 July, and **The News** [Islamabad], both in **JPRS-TND-025**, 2 August; **Nucleonics Week**, July 29, August 19; **Süddeutsche Zeitung**, **Frankfurter Allgemeine Zeitung**, **The Times** [London], **The Independent**, **International Herald Tribune**, all 25 September; **ENERpresse**, 27 September; **La Libération**, 29 September)

- **Smuggling of nuclear material** from former Soviet republics seems to be on the rise again. Reportedly, in Germany alone the police expect several hundred cases of nuclear-material smuggling during the current year. The cases reported in the press entail a wide range of nuclear materials; they include low-enriched uranium in fuel-ready form, but it seems that none involved plutonium or high-enriched uranium in significant quantities. Police in Western and Eastern Europe are said to cooperate routinely in attempts to prevent, trace and clear up cases of nuclear smuggling, but Russia's security forces are apparently less keen on sharing

information. In a number of cases supposed vendors offered goods which they could not produce or which were not as described; counting on the ignorance of prospective buyers, they often hugely inflate prices. The lack of ready markets for the materials offered seems to prompt some suspects to offer them in several places, which facilitates discovery. One factor in reducing the attractiveness of this trade is said to be the recent great reduction in the price of some strategic materials of which the United States and Russia are trying to divest themselves. Some of the reports pertain to trivial cases; others look spurious. In June, a court in Berlin sentenced two Austrians and a Pole to suspended prison sentences for the attempted sale of a small quantity of natural uranium and gram quantities of plutonium and cesium, presumably from Russia. In Ansbach, Germany, a Rumanian was given a prison sentence for trying to sell two consignments of natural uranium. A British Television reporter said he was offered 55 pounds of weapons-grade plutonium by a Russian dealer, and a Finnish newspaper was offered 33-35 pounds of the same material, reputedly coming from warheads of two SS-20 missiles in the possession of the dealer. Earlier, there was a report of several tons of a radioactive metal, supposedly beryllium, being found in a safe deposit vault in Vilnius. According to Austrian press comments the courts in that country treat nuclear smuggling mildly: three Slovak citizens found trying to sell 1.5 kg of supposed plutonium (which was in fact natural uranium) were released shortly after their arrest. Another group from Slovakia, caught with several fuel elements from a Soviet VVER-1000 reactor, were given a very brief prison sentence. In August, cooperating police services in Finland and Germany arrested seven persons, including two Russians, who were carrying micro-quantities of the isotope californium-252, obtained from the Tomsk-7 nuclear complex. They are said to have been aware of the high market value of the material, which they had hoped to sell in Germany. (**Latvian Radio Riga**, May 26; **Die Welt** and **Salzburger Nachrichten**, 16 June; **Süddeutsche Zeitung** and **Kurier**, 2 July; **Nucleonics Week**, September 2, 9; **Nuclear Fuel**, September 13)

- According to *Nucleonics Week*, the term 'red mercury', which is frequently used by European media in connection with the smuggling and sale of various nuclear-related materials of **Russian** origin, was utilised in the Soviet nuclear weapons programme for lithium-6. This material is understood to be used for the production of tritium, by irradiating it in a reactor, and, in the form of lithium-6 deuteride, as a thermonuclear weapons material. In the lengthy account in *Nucleonics Week*, one way of producing lithium-6 from natural lithium is by applying large amounts of mercury as a chemical agent. In the early days of the Soviet weapons programme, this was done, *inter alia* for export to China. Mercuric impurities reportedly contaminated the lithium-6, causing it to turn red. This supposedly led to the code name 'red mercury'. One recent German television programme claimed wide-spread international trade in the material. (**ZDF-TV** [Mainz], 13 July, in **JPRS-TND-93-023**, 19 July; **Nucleonics Week**, July 22)

- In June, **South Africa**'s underground nuclear test shafts in the Kalahari desert, 50 miles North of Upington, in the northern Cape, were filled in, in the presence of IAEA inspectors. The operation took several weeks. The Chief Executive Officer of the Atomic Energy Agency of South Africa, Dr. Waldo Stumpf, has announced that his country plans to maintain a stockpile of high-enriched uranium (HEU) for the Safari-1 reactor, which has been uprated to 20 MW. It has offered the excess to the UK and the USA. Material not suited for Safari-1 has been converted to low-enriched fuel for the Koeberg power station. The IAEA has been asked to consider additional safeguards for the stockpiled HEU. The United States is believed, however, to prefer seeing South Africa without any HEU, and while it is said not to be interested in buying it, it may consider helping South Africa to convert Safari-1 to use lower-enriched uranium fuel. Dr. Stumpf said he was not opposed in principle, but that conversion could not be allowed to interfere with current commercial work. Meanwhile, concerned about the increasingly unstable security situation in South Africa, several western countries are said to have urged Pretoria to move the HEU abroad for safekeeping. The government has denied that it has any plans to do so, but there is a report that it might be inclined to ask France to store the material, and draw from it as needed. (**Radio South Africa** [Johannesburg], 6 June, **SABC TV 1**, 7 June, in **JPRS-TND-93-018**, 14 June; **Transcript of Presentation by Dr. Waldo Stumpf**, Embassy of South Africa, Washington, August 4; **The Sunday Times**, 15 August; **NuclearFuel**, August 16)

II. PPNN Activities

- The PPNN Core Group held its thirteenth semi-annual meeting at the Chilworth Manor Conference Centre, Chilworth, University of Southampton, UK from Thursday 8 July to Monday 12 July 1993. All members of the PPNN Core group were present, with the exception of Olu Adeniji and Davidson Hepburn, who were prevented from attending due to professional commitments.

  From Friday 9 July to Monday 12 July, the Core Group convened an international seminar on *Issues at the 1995 NPT Conference*, which was attended by 38 nominees from 36 states. Participants in this seminar included representatives from four of the five nuclear-weapon States (France, Russian Federation, United Kingdom and United States) and from eight non-nuclear-weapon States that had recently acceded to the Treaty, as well as others representing a broad geographical spread of States Parties to the NPT.

  Members of the Core Group addressed three substantive issues in the course of their meeting. John Simpson and Darryl Howlett presented a paper on *Nuclear Security Guarantees and Assurances as a method of reinforcing the NPT*: this paper is intended to form the basis of PPNN Study 5. George Quester made a presentation on *The Future of Nuclear Deterrence.* Finally, David Fischer introduced a paper on *The Future of the IAEA*

- The international seminar on *Issues at the 1995 NPT Conference*, which was presided over by Ben Sanders,

was opened by Jayantha Dhanapala, Director General of the Ministry of Foreign Affairs, Sri Lanka, with an address on *Nuclear Non-Proliferation — The Current Context* after the initial dinner on Friday, 9 July. After the opening plenary session on *A Preliminary Review of the Issues* by David Fischer the participants split into 3 groups of 12–13 participants. The smaller working groups were more conducive to fostering constructive discussion than larger plenary sessions. During these working group sessions, short presentations were made on aspects of four sets of issues, each followed by animated discussions in which a broad range of views was expressed. The issues were clustered as follows:

Issue Cluster A: *The Extension of the Treaty* was chaired by Adolfo Taylhardat, with presentations from Ben Sanders (*Pre-Conference Activities — Substantive and Organisational Work by States and Secretariat*) and George Bunn *(Procedural Issues — The Nature of the Review/Extension Conference: Implications for the Extension Decision)*. The rapporteur was Simon Crowe.

Issue Cluster B: *The Review of the Treaty — Security Questions* was chaired by Jayantha Dhanapala and Oleg Grinevsky. Presentations were made by Lewis Dunn *(The Obligations of Parties (Articles I and II)*, Tariq Rauf *(Nuclear Disarmament — (Article VI)*, and Jozef Goldblat *(Nuclear-Weapon-Free Zones)*. Jozef Goldblat also presented a paper by Olu Adeniji *(Security Assurances)*. The rapporteur was Helen Leigh-Phippard.

Issue Cluster C: *The Review of the Treaty — Peaceful Uses and Verification* was chaired by Jiri Beranek. Presentations were made by Djali Ahimsa *(Peaceful Uses (Articles IV and V)*, Lawrence Scheinman *(Verification (National and International Monitoring, including IAEA Safeguards, and Action in the Event of Non-Compliance) (Article III)* and Harald Müller *(Export Controls* (Article III.2). The rapporteur was Darryl Howlett.

Issue Cluster D: *The Review of the Treaty — Regional Issues* was chaired by Thérèse Delpech. Presentations were made by Mohamed Shaker *(The Middle East, Israel and Iraq)*, Yoshio Okawa *(North Korea's Bid to Withdraw from the NPT)*, and Roland Timerbaev *(The CIS States)*. The rapporteur was John Redick.

The seminar concluded with a plenary discussion centred on a presentation by the Rapporteur, John Simpson, based on the working group discussions.

Copies of the papers from this seminar will be published commercially by Macmillan in 1994, and will also be used in bound form as briefing documents for future PPNN Briefing Conferences.

- Jan Murray of Australia has accepted an invitation to rejoin the Core Group.

- The next meeting of the PPNN Core Group will be combined with a regional workshop, and is scheduled to take place in Kandy, Sri Lanka from Thursday 4 to Monday 8 November 1993. The workshop will examine the global non-proliferation system, its implications for South Asia and how it is viewed from that region. The meeting will be organised in conjunction with the Banderanaike Centre in Colombo.

- PPNN plans to hold two meetings of its Core Group in 1994, in association with other activities. The first will probably be in early May, and held at a location in Central America. This meeting will be linked to a workshop for senior diplomats from all American states on the 1995 NPT conference ,and a symposium for non-proliferation specialists reviewing the current state of the nuclear non-proliferation regime. The second will be in the United States in early November, and will be combined with a PPNN Briefing Conference on 1995 aimed at State representatives attending the First Committee of the UN General Assembly.

- PPNN Study 4, *Nuclear Export Controls and Supply Side Initiatives: Options for Reform* by Harald Müller and Lewis Dunn will be published and distributed in early October. It is hoped to distribute PPNN Study 5, *Security Assurances and Guarantees as a Method of Reinforcing the NPT* in early 1994.

- Work is proceeding on the production of bound volumes of papers from the PPNN conferences in Germany in May 1992 and Zimbabwe in April 1993.

III. Recent Publications

- Books:

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Richard Dean Burns (ed.), **Encyclopedia of Arms Control and Disarmament**, (New York, Charles Scribener's Sons, 1993) 3 Vols., 1,692 pp.

Brahma Chellaney, **Nuclear Proliferation: The US-Indian Conflict**, (New Delhi, Longman, 1993).

Brahma Chellaney, **Technology and Security: Implications of the Expanding Web of Technology Controls**, (New Delhi, Centre for Policy Research, 1993).

Martin Van Creveld, **Nuclear Proliferation and the Future of Conflict**, (New York, The Free Press, 1993), 173 pp.

Mohamed M. ElBaradei, Edwin I. Nwogugu and John M. Rames, Editors, **The International Law of Nuclear Energy: Basic Documents**. Martinus Nijhoff, Publishers, Dordrecht/Boston/London, 1993, two volumes - 2117 pp.

Martin Navias, **Going Ballistic: The Build up of Missiles in the Middle East**, (IISS, London, 1993), 270 pp.

Major General Vladimir Nosov, **The Strategic Missile Forces**, (Moscow, 1993), 400 pp. (Copies available at Moscow 107078, 3 Sadovaya spasskaya Ul., Dom Voennoi Knigi, account No. 340804 in the Kievsky Branch of MInB, MFO 201801).

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Alyson J. K. Bailes, 'A Nuclear Capable Europe: The Case For the British Deterrent', *Security Dialogue*, Vol. 24, No.3, September, pp. 323-332.

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Rod Barton, 'Eliminating Strategic Weapons, the Case of Iraq', *Pacific Research*, Vol. 6, No. 3, August, pp. 11-13.

Wolfgang Biermann, 'Overcoming Nuclear Orthodoxy: A Rejoinder', *Security Dialogue*, Vol. 24, No. 3, September, pp. 333-336.

James A. Boutilier (ed.), 'Arms Control in the North Pacific: The Role For Confidence Building and Verification', Non Proliferation, Arms Control and Disarmament Division, External Affairs and International Trade Canada, *Cooperative Research Workshop 19-21 February*, Final report, April, 164 pp.

Paul Bracken, 'Nuclear Weapons and State Survival in North Korea', *Survival*, Vol. 35, No. 3, Autumn, pp. 137-153.

Michael Brown, 'Nuclear Arms Control', in Trevor Findlay (ed.), *Arms Control In The Post -Cold War World, With Implications For Asia/Pacific*, (Peace Research Centre, Research School of Pacific Studies, Australian National University, Peace Research Monograph No. 13, Canberra, 1993), pp. 11-40.1-10.

Oleg Bukharin, 'Soft Landing For Bomb Uranium' [Russian HEU], *The Bulletin of the Atomic Scientists*, Vol. 49, No. 7, September 1993, pp. 44-49

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IV. Documentation

White House Fact Sheet on President Clinton's Nonproliferation and Export Control Policy [Extract]

Fissile Material

The U.S. will undertake a comprehensive approach to the growing accumulation of fissile material from dismantled nuclear weapons and within civil nuclear programs. Under this approach, the U.S. will:

- Seek to eliminate where possible the accumulation of stockpiles of highly-enriched uranium or plutonium, and to ensure that where these materials already exist they are subject to the highest standards of safety, security and international accountability.
- Propose a multilateral convention prohibiting the production of highly-enriched uranium or plutonium for nuclear explosives purposes or outside of international safeguards.
- Encourage more restrictive regional arrangements to constrain fissile material production in regions of instability and high proliferation risk.
- Submit U.S. fissile material no longer needed for our deterrent to inspection by the International Atomic Energy Agency.
- Pursue the purchase of highly-enriched uranium from the former Soviet Union and other countries and its conversion to peaceful use as rector fuel.
- Explore means to limit the stockpiling of plutonium from civil nuclear programs, and seek to minimize the civil use of highly-enriched uranium.
- Initiate a comprehensive review of long-term options for plutonium disposition, taking into account technical, nonproliferation, environmental, budgetary and economic considerations. Russia and other nations with relevant interests and experience will be invited to participate in this study.

The United States does not encourage the civil use of plutonium and, accordingly, does not itself engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes. The United States, however, will maintain its existing commitments regarding the use of plutonium in civil nuclear programs in Western Europe and Japan.

Export Controls

To be truly effective, export controls should be applied uniformly by all suppliers. The United States will harmonize domestic and multilateral controls to the greatest extent possible. At the same time, the need to lead the international community or overriding national security or foreign policy interests may justify unilateral export controls in specific cases. We will review our unilateral dual-use export controls and policies, and eliminate them unless such controls are essential to national security and foreign policy interests.

We will streamline the implementation of U.S. nonproliferation export controls. Our system must be more responsive and efficient, and not inhibit legitimate exports that play a key role in American economic strength while preventing exports that

would make a material contribution to the proliferation of weapons of mass destruction and the missiles that deliver them.

Nuclear Proliferation

The U.S. will make every effort to secure the indefinite extension of the Non-Proliferation Treaty in 1995. We will seek to ensure that the International Atomic Energy Agency has the resources needed to implement its vital safeguards responsibilities, and will work to strengthen the IAEA's ability to detect clandestine nuclear activities.

Missile Proliferation

We will maintain our strong support for the missile technology control regime. We will promote the principles of the MTCR Guidelines as a global missile nonproliferation norm and seek to use the MTCR as a mechanism for taking joint action to combat missile proliferation. We will support prudent expansion of the MTCR's membership to include additional countries that subscribe to international nonproliferation standards, enforce effective export controls and abandon offensive ballistic missile programs. The United States will also promote regional efforts to reduce the demand for missile capabilities.

The United States will continue to oppose missile programs of proliferation concern, and will exercise particular restraint in missile-related cooperation. We will continue to retain a strong presumption of denial against exports to any country of complete space launch vehicles or major components.

The United States will not support the development or acquisition of space-launch vehicles in countries outside the MTCR.

For MTCR member countries, we will not encourage new space launch vehicle programs, which raise questions on both nonproliferation and economic viability grounds. The United States will, however, consider exports of MTCR-controlled items to MTCR member countries for peaceful space launch programs on a case-by-case basis. We will review whether additional constraints or safeguards could reduce the risk of misuse of space launch technology. We will seek adoption by all MTCR partners of policies as vigilant as our own.

Chemical and Biological Weapons

To help deter violations of the Biological Weapons Convention, we will promote new measures to provide increased transparency of activities and facilities that could have biological weapons applications. We call on all nations — including our own — to ratify the Chemical Weapons Convention quickly so that it may enter into force by January 13, 1995. We will work with others to support the international Organisation for the Prohibition of Chemical Weapons created by the Convention.

Regional Nonproliferation Initiatives.

Nonproliferation will receive greater priority in our diplomacy, and will be taken into account in our relations with countries around the world. We will make special efforts to address the proliferation threat in regions of tension such as the Korean peninsula, the Middle East and South Asia, including efforts to address the underlying motivations for weapons acquisition, and to promote regional confidence-building steps.

In Korea, our goal remains a non-nuclear peninsula. We will make every effort to secure North Korea's full compliance with its nonproliferation commitments and effective implementation of the North-South denuclearisation agreement.

In parallel with our efforts to maintain a secure, just and lasting peace in the Middle East, we will promote dialogue and confidence-building steps to create the basis for a Middle East free of weapons of mass destruction. In the Persian Gulf, we will work with other suppliers to contain Iran's nuclear, missile, and CBW ambitions, while preventing reconstruction of Iraq's activities in these areas. In South Asia, we will encourage India and Pakistan to proceed with multilateral discussions of nonproliferation and security issues, with the goal of capping and eventually rolling back their nuclear and missile capabilities.

In developing our overall approach to Latin America and South Africa, we will take account of the significant nonproliferation progress made in these regions in recent years. We will intensify efforts to ensure that the former Soviet Union, Eastern Europe and China do not contribute to the spread of weapons of mass destruction and missiles.

The Programme for Promoting Nuclear Non-Proliferation and the Newsbrief

The **Newsbrief** is part of the outreach effort which constitutes a major element of the Programme for Promoting Nuclear Non-Proliferation (PPNN). It is addressed to an audience interested in the subject of nuclear (non-)proliferation, to inform and help them alert their respective environments to the issue of nuclear non-proliferation.

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