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PROGRAMME FOR PROMOTING NUCLEAR NON-PROLIFERATION

Number 24 **NEWSBRIEF** **4th 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, during the last three months of 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. Using 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 — somewhat altered here from those used in previous issues — are chosen for ease and logic of presentation; they do not necessarily imply a judgement on the nature of the events referred to. Similarly, 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**. Thus, while developments in the Democratic People's Republic of Korea and in Ukraine would fit under the heading **j. Developments of Concern for Horizontal Proliferation**, starting on page 17, in view of their topical nature they are presented early on in this issue under the general heading of **Background**. Conversely, current disclosures of radiation experiments on human beings made in the United States in the 1940s, 1950s and 1960s are covered together with other developments in that country, under the heading **h. Weapons-related Developments in Nuclear-Weapon States**, on page 13.

PPNN's Executive Chairman, Ben Sanders, is editor of the **Newsbrief**. He produces it and takes sole responsibility for its contents. The inclusion of an item in the **Newsbrief** does not necessarily imply concurrence by the members of PPNN's Core Group, collectively or individually, either with its substance or with its relevance to PPNN's work.

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 in this issue date from 1993.

I. Topical Developments

a. Background

- The announcement by the **Democratic People's Republic of Korea (DPRK)**, last March, that it was withdrawing from the NPT, set off vigorous diplomatic efforts to persuade it to reconsider that decision; they continue to this day. The DPRK's move was said to have been triggered by the IAEA's request for access to two non-declared sites thought to contain nuclear waste, to clarify indications that it might have produced fissile material of which it had not notified the Agency. During subsequent developments, outlined in the three preceding issues of the **Newsbrief**, the DPRK further curtailed inspection access by the IAEA, which was ultimately confined to servicing the monitoring equipment it had installed at two facilities.

  When, by late September, the best efforts of the IAEA, the United States and several of the DPRK's neighbours had not been able to resolve the dispute, the IAEA's General Conference adopted a resolution endorsing the Agency's 'impartial efforts' to implement the safeguards agreement and urging the DPRK to cooperate immediately in the full implementation of that agreement. The DPRK reacted by calling that resolution unjust and a violation of its sovereignty, and said it might refuse the IAEA even the limited inspection access it still had. Claiming that the message presented at the opening of the IAEA's General Conference by U.N. Under-Secretary-General Petrovsky on behalf of the Secretary-General had been faked by the IAEA — which the United Nations promptly denied — it announced that it could no longer negotiate with an organisation so biased against it.

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In late October, mainly, it is thought, in an effort to keep the dialogue going with the United States, Pyongyang informed the IAEA that it would after all permit it to carry out routine maintenance of its surveillance equipment. The Agency's Director General refused, however, on the grounds that it was not for the inspected country to pick and choose among the safeguards measures provided for in the agreement to which it was a party. On 1 November, Dr. Blix repeated before the U.N. General Assembly that the DPRK was seeking to restrict the Agency's verification activities and said the area of non-compliance with the safeguards agreement had been widening, that several verification actions in respect of the DPRK's declared nuclear activities were overdue and that the continuity of some safeguards-related data had been impaired. The longer the Agency was precluded from conducting inspections, he stated, the more safeguards-relevant data would deteriorate and the less assurance safeguards could provide that even declared facilities were used only for peaceful purposes.

Subsequently, by 140 votes in favour, 1 against (DPRK), and 9 abstentions (Angola, China, Cuba, Ghana, Guinea, Iraq, Mali, Senegal, Vietnam), the Assembly adopted a resolution along the lines of that passed earlier by the Agency's General Conference, and calling on the DPRK to cooperate immediately with the IAEA in the full implementation of the safeguards agreement.

Reportedly, the main reason why it has not so far been possible to resolve the issue of safeguards in direct talks between the IAEA and the DPRK is the latter's wish to deal with the Korean nuclear question as a whole in bilateral discussions with the USA, which should also settle the issue of relations, including diplomatic recognition by Washington. Reports about working-level discussions between diplomats of the two states surface recurrently. The U.S. Administration has all along made it clear, however, that it would consent to further formal talks only after Pyongyang allowed the full IAEA inspections and resumed its discussions with the Republic of Korea (RoK).

Tension appeared to rise in early November, when the American Secretary of Defense, Les Aspin, visited Seoul and warned of the possibility of armed conflict. At that time, an increased combat alert was noted of the DPRK's armed forces, 70% of which were said to be concentrated near the demilitarised zone between the two Korean states — a situation which Seoul was reported not to see as unusual or alarming. American and South Korean armed forces started their annual six-day army manoeuvres code-named *Foal Eagle*, raising new protests from Pyongyang.

Press reports of mid-November noted a possible shift in the DPRK's attitude, reflected in its statement that a solution might be found in the form of an agreement under which it would comply fully with nuclear safeguards in exchange for the USA 'renouncing the nuclear threat and hostile policy against DPRK', including the cancellation of US/RoK military exercises. Some senior officials in the U.S. State Department are seen as tending towards a conciliatory approach along these lines, while the Joint Chiefs of Staff and the Defense Department are said to consider that the question of IAEA access to two sites where indications might be found regarding possible undeclared nuclear activities in the DPRK should be settled first. This point was made also by Secretary of State Christopher, who, on the eve of the summit meeting of the Asia-Pacific Economic Cooperation Forum on 23 November, said that it was the first obligation of the DPRK to accept full inspections and denuclearise the Korean Peninsula.

Reportedly, the possibility of asking the Security Council to adopt sanctions against the DPRK is seen in Washington as an option of last resort. It is known, and was reiterated to U.N. Secretary-General Boutros-Ghali during his visit to Beijing on 26 December, that China is not in favour of sanctions and prefers continued dialogue with the DPRK; Japan, too, is said to fear that international pressure on the Pyongyang might be counterproductive. South Korea is seen as apprehensive of pushing DPRK 'too far', without, however, wishing to seem too compliant. Its attitude was thought to have hardened after the failure of the latest round of inter-Korean talks, which had been resumed in mid-October. At these talks the South's offer for an exchange of presidential special envoys stranded on a series of demands which the DPRK wished to have met first, including one for the cessation of joint military exercises. Pyongyang subsequently cancelled the meetings, saying that Seoul's defence minister had made 'dangerous remarks'; some South Korean sources, however, see the suspension of the talks as a possible ploy by Pyongyang to gain time for a revision of its policies, and Seoul generally seems to favour a low-key approach to the nuclear problems with the DPRK. In Washington, a classified report by military experts is quoted as warning that an armed conflict with the North would make extremely heavy demands on American military capabilities and everything possible should be done to avoid it. Given the inability to predict Pyongyang's reaction, U.S. officials reportedly not only rule out a preemptive strike at the DPRK's nuclear facilities, but also fear the possible consequences of stringent economic sanctions.

During a visit to Washington, on 23 November, South Korean President Kim Young Sam is said to have agreed with President Clinton on a 'package' of inducements for the DPRK, in return for its agreeing to 'some' inspections and a resumption of bilateral talks between the two Korean states. Reportedly, however, President Kim was reluctant to accept the American idea of offering Pyongyang a suspension of the annual *Team Spirit* exercises as he felt, it was said, that the offer should come from Seoul and could be made only once DPRK had accepted a resumption of 'basic' safeguards and of bilateral talks. Subsequently, rather than, as suggested earlier, holding out small specific rewards for steps that should lead to the opening of the country's nuclear installations to international inspection — an idea criticised as a bad precedent for other states seeking to violate the NPT — President Clinton told the DPRK that if it moved first, the United States and the Republic of Korea would respond with a 'thorough and broad' package of concessions. Presumably, this would include suspension of military exercises, a commitment not to use nuclear weapons against the DPRK, reduction in the US forces in the South and eventually economic and

diplomatic relations. But Mr. Clinton added that in case of continued DPRK intransigence the United States would have to resort to other means of persuasion. Pyongyang's first reaction was to warn that any pressure, such as recourse to Security Council sanctions, would 'produce very dangerous consequences'. Meanwhile, on 2 December, the Agency's Director General informed the Board of Governors that there was no longer any meaningful assurance of peaceful use of the declared material and installations in the DPRK. He also said that the DPRK had let it be known that it had frozen the movement of nuclear material. The Director General was seen to have stopped just short of a finding that the Agency could no longer apply safeguards, i.e., was unable to verify that there had not been a diversion of safeguarded material, which would have obliged the Board to take the matter to the Security Council. His statement was thought, however, to add urgency to Washington's quest for an early solution of the issue.

On 3 December it was reported that DPRK diplomats in New York had advised American officials that IAEA inspectors could have access to five of the nuclear sites officially disclosed to the Agency by Pyongyang, but that with regard to the 5-MW reactor and the reprocessing facility, IAEA inspection access would be restricted to the servicing and recharging of the Agency's monitoring devices installed there. The DPRK added that it was willing to negotiate about greater access, but did not specify. The possibility of special inspections of the two sites that might yield evidence of non-reported plutonium extraction appears not to have been mentioned. The offer was made contingent on the United States and South Korea jointly announcing the cancellation of the *Team Spirit* exercises and on the selection of a date for a new round of high-level discussions on economic and diplomatic relations. Pyongyang also said it would only discuss the exchange of envoys if Seoul cancelled all other military exercises other than *Team Spirit* as well, and stopped 'international pressure efforts'. It later added that this was its 'last concession' and that, if that was turned down, it would conclude that Washington no longer had the intention to continue the dialogue. At the same time, it said that once it could agree with the United States on a package solution, it would allow the IAEA full inspection.

For its part, the IAEA called Pyongyang's offer unacceptable: it needed unimpeded access to the reactor and the reprocessing plant to ensure that fuel had not been transferred between them. The Agency's spokesman repeated as a matter of principle that a party to a safeguards agreement could not be allowed unilaterally to determine the scope of inspections at facilities of which it had officially notified the Agency. Reportedly, in order to restore continuity of knowledge about the DPRK's nuclear material inventory it would need to inspect the seals it has placed on material containers and reprocessing equipment; it would also wish to carry out a physical inventory verification, check operating records, service and reload monitoring equipment, and count spent fuel rods.

In Seoul and Washington the DPRK's response was seen as leaving room for further discussion. President Clinton said he would go on trying to persuade Pyongyang to consent to inspection of its facilities, and was not yet ready to seek sanctions against it. In a meeting on 10 December, the United States again offered to cancel *Team Spirit* and begin talks about economic aid and diplomatic recognition, if the DPRK allowed full inspection of all its nuclear facilities and resumed the dialogue with the South. As reported, the offer was accompanied by the warning that the next step would be to seek Security Council sanctions. A week later, Pyongyang denounced the offer as 'nothing new', but it did not shut the door to further talks, while refusing an offer of mediation, made by U.N. Secretary-General Boutros Boutros-Ghali during a visit to Pyongyang in late December, as 'not needed' at this time. The Secretary-General later expressed his conviction that the political will existed in Pyongyang for a negotiated settlement. At year's end, reports from Pyongyang, Washington and Seoul spoke of significant progress in the bilateral talks. In a New Year's address on 1 January, the DPRK's 'paramount leader', Kim Il Sung, announced that his country had agreed to make a 'joint statement' with the U.S., as a step to settlement of the dispute. This was later clarified in Pyongyang as confirming what DPRK diplomats had told the United States a day earlier, that the IAEA would be given access to the seven declared nuclear sites for one-time inspections; according to this information the IAEA would not be permitted to make regular inspections, nor was there any question, apparently, of granting access for special inspections of the two suspected nuclear waste sites. There was no immediate official American comment, but sources in Washington said that nothing short of full compliance with the Treaty and the safeguards agreement with the IAEA would make it possible for the United States to consider establishing full diplomatic relations and economic ties. Administration officials reportedly said that the bilateral discussions were still deadlocked.

Reports from Washington reflect differences of opinion within the intelligence community about the nature of Pyongyang's nuclear activities and the threat they pose. The view of the CIA is said to be that the DPRK is 'aggressively' trying to build nuclear weapons and that in its negotiations with the United States it is just 'playing for time'. The Washington media report that most of the American intelligence community hold the opinion that there is a better-than-even chance that the DPRK has produced enough plutonium for one or two nuclear weapons, and there is speculation that it may already have fabricated the actual devices. Sources within the Bureau of Intelligence and Research and the State Department, however, are seen as playing down the amount of progress made, and Pentagon officials are also quoted as saying that the alarming intelligence analyses reflect a worst-case scenario, supposedly inspired by earlier misjudgements of the DPRK's nuclear capabilities. Defense Secretary Aspin said in a recent television interview that 'the [existing] range of uncertainty [included] the possibility that they might at this moment possess a single nuclear device'; his estimate is said to have been based on the knowledge that the refuelling machine at the 5-MW reactor can only operate very slowly. Apparently, if the machine worked properly, on-line refuelling should be possible. In fact, it

seems that the reactor may be closed down for short periods to remove rods, without being detected by infra-red monitoring equipment carried in U.S. satellites. Reportedly, American officials do not believe that the amount of fuel that could be removed during such short outages would yield significant amounts of separable plutonium. It appears that the reactor has not been shut down for a longer period since 1989. Contrary to DPRK contentions, U.S. experts are said to believe that there is no technical need to change the whole reactor core soon.

Some observers suggest that Pyongyang may be less advanced than it would have its neighbours and the United States believe. In this view, the DPRK's refusal to open its nuclear facilities to international scrutiny arises from its unwillingness to reveal its scant progress. A Seoul newspaper, for instance, claims that according to the Foreign Ministry in Seoul, Russian experts who were involved in Pyongyang's nuclear programme have told the South Korean government that the DPRK will not be able to develop nuclear warheads for several years. The paper quotes the chairman of the Committee for International Relations of the Russian Ministry of Atomic Energy, Michael Ryzhov, as saying that 'North Korea, having no capability of producing nuclear weapons, pretends to the outside world that [its] development of nuclear weapons is impending' and that Russian specialists were of the general opinion that the DPRK was 'trying to use this as a bargaining chip for negotiations ...' Chinese diplomats reportedly also disbelieve American reports about the DPRK's nuclear capability. Sources in Beijing say that President Kim Il Sung told them that his country lacked the capability, the technology and the funds to make nuclear weapons, and that it would in any case be 'useless' to make 'a couple of nuclear bombs'. Recent American intelligence data are said to indicate little current nuclear activity, which might confirm the DPRK's assertion that it would not refuel the 5-MW reactor soon. On the other hand, some observers see these reports as intended to make the resumption of IAEA inspections seem less urgent, and gain time for talks. A report from Seoul cites an American official conversant with nuclear issues in the DPRK as saying that the 200-MW natural-uranium reactor at Yongbyon, on which work was thought to be suspended, will be completed in 1995, and that the 50-MW reactor would be operational very soon.

A report from Moscow says that a senior military attaché at the DPRK embassy there was expelled recently for trying to recruit Russian nuclear scientists for work in his country. Earlier, some Russian nuclear specialists were detained as they boarded an airplane for Pyongyang.

According to reports from Japan, hard currency, earned by the Korean community there and largely collected in gambling parlours run by Japanese-Korean conglomerates, is routinely ferried over from Osaka to Pyongyang to finance nuclear activities. The figure of $600-million a year is mentioned.

(**Xinhua** [Beijing], 16 September, in **JPRS-TND-93-030**, 27 September; **Süddeutsche Zeitung**, 2, 4, October; **Frankfurter Allgemeine Zeitung**, 3, 14, 16 October; **Le Monde**, 4 October, 3 November; **Wall Street Journal**, October 4; **International Herald Tribune**, October 4, 5, 16, 27, 28, November 5, 6/7, 10, 12, 13, 16; **Financial Times**, October 6, November 5, 24; **Nucleonics Week**, October 7, December 23; **Time**, October 11; **Chungang Ilbo** [Seoul], 22 September, in **JPRS-TND-93-032**, 12 October; **The New York Times**, October 13, 15, 27, 30, November 1, 2, 4, 7, 8, 16, 18, 22, December 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 15, 18, 21, 25, 26, 27, 28, 31, January 2, 1994; **DPRK Statement in UN General Assembly**, 22 October; **Associated Press**, October 24, 27, 28, 29, 30, November 2, 16; **The Standard**, 24 October; **KCNA** [Pyongyang], 15 October, in **JPRS-TND-93-034**, 27 October; **Yonhap** [Seoul], 5 October, in **JPRS-TND-93-032**, 13 October; 15 October, in **JPRS-TND-93-034**, 27 October; and 1 and 3 November, in **JPRS-TND-93-036**, 17 November; Editorial Report in **JPRS-TND-93-036**, 17 November; **IAEA Documents** INFCIRC/422, 19 October, and INFCIRC/423, 27 October, **Press Release** PR 93/25, 2 December; **The Times** [London], October 28; **Washington Post**, October 28, 31, November 1, 2, 5, 15, 17, December 12; **IAEA Press Release**, PR 93/24, 1 November; **Daily News** [Colombo], November 3; **Newsweek**, November 8, 15; **NuclearFuel**, November 8, December 20; **The Economist**, November 13th; **The Independent**, 16, 17 November; **Daily Telegraph**, 16 November; **The Guardian**, November 24)

- Concern about **Ukraine**'s nuclear policy continues. The conditions set by Kiev for the fulfilment of its undertaking to ratify and implement the START-1 Treaty and join the NPT as a non-nuclear-weapon state, which it assumed in May 1992 by subscribing to the Lisbon Protocol, and which it has since repeatedly confirmed, have stiffened. There is evidence that a large section of the country's population feel that nuclear weapons could assure its survival as a nation; this feeling has lately been reported to have been reinforced by the fear that recent political gains in Russia by ultra-nationalists and neo-fascists may generate new expansionist tendencies in Moscow. Reports about discussions in the Ukrainian Parliament reflect a feeling that the country can derive strategic security and economic viability from its position as the third largest nuclear-weapon state, with a strategic arsenal said to be bigger than those of China, France and the United Kingdom combined, without, however, foregoing the advantage of eventual denuclearisation. The tendency therefore seems to be to retain a major part of the strategic ballistic missiles now on Ukrainian territory, with the intention of removing them as and when the country's security is deemed to allow doing so. Meanwhile, a start would be made with the dismantling of the outdated fleet of SS-19 ballistic missiles, if the necessary financial support is obtained from the West, and on the understanding that, since the weapons now in the country 'are the property of the Ukrainian people', compensation is received for the nuclear material in the warheads, as well as that which was contained in the approximately 2,000 tactical weapons already moved to Russia.

  The United States has made its offers of assistance dependent on the Ukraine's denuclearisation. During a

visit to Kiev, in October, U.S. Secretary of State Christopher was assured by Ukrainian officials that the country adhered to the pledge to divest itself of nuclear weapons, but that it would need large-scale financial help to do so, and it was essential that the United States, as well as other nuclear-weapon powers would formally undertake not to use nuclear or conventional force against Ukraine, and to come to its assistance if any other state did use or threaten such force against it. Reportedly, Kiev does not consider the negative security guarantees given it by Washington adequate. The Russian Federation has promised to give security guarantees, but these are understood to apply only as long as Ukraine remains part of the Commonwealth of Independent States — a condition apparently not acceptable to Kiev. According to a report of *BASIC*, the British American Security Information Council, in September Ukraine gave the five nuclear-weapon states a draft treaty on security guarantees which foresees four categories: negative and positive nuclear guarantees, guarantees with respect to the use of conventional force, reinforced by the promise to respect Ukraine's territorial integrity, and guarantees precluding the use of economic pressure on Ukraine for political ends. As to the stage at which security guarantees would be required, views seem to diverge. The Chairman of the foreign relations committee of the Ukrainian Parliament is quoted in the press as demanding a Western promise to defend Ukraine against attack as a condition even for the return of the 130 SS-19s.

With regard to the financial incentives offered by the United States, the $175 million earmarked for dismantling Ukraine's nuclear weapons, and the $155 million promised for economic development are seen as falling far short of needs. For the dismantling operation alone, Ukraine reportedly says it needs $2.8 billion; the speaker of Ukraine's parliament has mentioned figures ranging from $3.6 billion to $5 billion.

During a closed session on 18 November, the Ukrainian Parliament ratified START-1, with 254 to 9 votes and 30 abstentions, while adopting a 13-point list of conditions and with the statement that it does not feel bound by Article V of the Lisbon Protocol which requires it to give up all nuclear weapons. Generally, the conditions seem to follow the lines sketched above. The media report that Parliament approved the START-1 on the condition, among others, that initially only sixty-three, i.e., 36%, of the 176 ballistic missiles would be dismantled, involving 520 warheads, i.e., 42% out of the total of 1,240. The rest would remain for now on Ukrainian territory. It reportedly also expressed its understanding that Ukraine owned all weapons on its territory, and demanded compensation for the costs of dismantling, transfer of weapons to Russia, and the value of the nuclear material in the warheads. It was also said to have incorporated demands for the four groups of undertakings sketched above. The Parliament's attitude appears to be that the transition to non-nuclear weapon status is a long-term process, for which no deadline can be set. The upshot of its decision, as qualified by political commentators and politicians in a variety of media reports from Kiev, is that in time all nuclear weapons will be returned to Russia or dismantled in Ukraine once all thirteen conditions are met, including that of up to US$5 billion (some reports speak of $2.8 billion) in international assistance, over a period of four years.

While calling the decision 'an important first step' towards disarmament, Ukraine's President Kravchuk is seen as disagreeing with the imposition of conditions by Parliament and is cited as saying that Ukraine should get rid of weapons it 'could not use or fully control'. He has reportedly told Washington that he would resubmit the matter to a new Parliament after elections in March 1994. Reiterating that he strongly favours unequivocal ratification of START-1 and accession to NPT, President Kravchuk has also criticised the West for not doing enough for Ukraine security and not supporting it with adequate finances. In November, President Kravchuk reportedly assured President Clinton that while the 46 SS-24 ballistic missiles would be retained, they should be removed from alert and their targeting codes altered so that they were no longer aimed at the United States. On 20 December, Ukraine's Deputy Prime Minister Shmarov said that the warheads of 17 SS-24s had been removed from the missiles, and that three more would be deactivated before the end of 1993. He further said that Ukraine was prepared to remove all SS-24s from military alert only if a satisfactory agreement on economic compensation and security assurances could be worked out.

Russia has reacted sharply to the decision of Ukraine's Parliament. In his December meeting with U.S. Vice-President Gore, President Yeltsin accused Ukraine of deception; observers in Moscow expect that the electoral gains by ultra-nationalist elements will lead to a hardening of Russia's attitude towards Ukraine. The thought that the decision might seriously delay implementation of START-1 and concerns about the negative influence it may have in the domain of nuclear non-proliferation is said to spur Washington to renewed efforts at persuading Kiev to review its policies. One step urged by Washington was for Ukraine to deactivate its nuclear weapons, and Kiev's action in that regard is seen as a partial, but so far unsatisfactory response. The U.S. Administration is said to consider the possibility of offering its mediation to help solve the disputes between Russian and Ukraine that lie at the source of the latter's concerns. There is also talk about the possibility of trilateral talks, in particular about security assurances. On the other hand, what is reputedly seen by some Western diplomats as Ukraine's 'nuclear blackmail' is said not to help it obtain the economic assistance it seeks. A recent report from Kiev has it that talks with Russian and American senior officials have led to preliminary agreement on the principle that Ukraine will receive compensation for giving up nuclear weapons. There has been no confirmation from Washington, and no figures have been mentioned.

Meanwhile, Russian sources express concern about the lack of service and the condition of storage as well as the alleged deterioration of nuclear warheads in Ukraine, particularly those of the 130 SS-19 missiles, which are said to be nearing the end of their operational life (twenty have already been taken off military alert for this reason). Ukrainian sources say there is no ground for

alarm. However, in October, several SS-19 warheads were found to be in a 'pre-accident' mode and were sent back to Russia. The transport was reportedly delayed by more than two weeks because of disagreements between Russian and Ukrainian officials about the legal formalities involved. Russia maintains that the warheads can only be considered safe for the next 24 months.

Discussions have begun between Ukraine and the IAEA on a draft safeguards agreement applying to all nuclear material used for peaceful purposes in Ukraine. Reportedly, it is assumed in the negotiations that Ukraine will in the future be a non-nuclear-weapon state. The negotiations are expected to take 12 to 18 months; if by the end of that period it has not acceded to the Treaty, there would have to be a decision whether Ukraine will negotiate a full-scope safeguards agreement with the IAEA, or a so-called INFCIRC/66 agreement, which would pertain to specific facilities.

(**Nucleonics Week**, October 7; **Frankfurter Allgemeine Zeitung**, 13, 25, 26, 27 October; **The New York Times**, October 20, 26, November 6, 19, 22, 30, December 2, 4, 19, 21; **Financial Times**, 22, 25, 26 October, 19 November, 15, 16, 20, December; **Die Presse**, 23 October; **Süddeutsche Zeitung**, 23 October, 22 November, 11 December; **Kurier**, 24 October; **Le Monde**, 25, 27 October; **Daily Telegraph**, 26 October; **The Independent**, 26 October, 20 November; **The International Herald Tribune**, October 26, November 6/7, 19, 20/21; **Holos Ukrayiny** [Kiev], and **Komsomolskaya Pravda**, both 7 October, in **JPRS-TND-93-034**, 27 October; **Neue Zürcher Zeitung**, 27 October; **Enerpresse**, 27 October; **Salzburger Nachrichten**, 27 October; **The Washington Post**, October 31; **Komsomolskaya Pravda**, 26 October, in **JPRS-TND-93-035**, 10 November; **Izvestiya**, 26 October, in **JPRS-TND-93-035**, 10 November; **Der Standart**, 19 November; **The Economist**, November 27th; **Jane's Defence Weekly**, 27 November; **BASIC Reports**, No. 35, 29 November; **IAEA Press Release** PR 93/25, 2 December; Secretary of Defense L. Aspin, in an interview on **The McNeil-Lehrer Newshour**, on **PBS/WNET** [New York], 7 December)

- The **dumping of radioactive waste** into the sea has received much attention lately. On 17 October, shortly after Russian President Yeltsin and Japan's Prime Minister Hosokawa, during their meeting in Tokyo, had discussed a range of subjects for co-operation and *inter alia* expressed concern about the ocean-dumping of radioactive waste, it was announced that a Russian tanker had pumped 900 cubic metres (other reports speak of 990 tons) of liquid low-level radioactive waste, supposedly from a plant near Khabarovsk, where nuclear submarines are serviced, repaired and decommissioned, into the Sea of Japan. Soon after came the news that there would shortly be a second release, of about 800 cubic metres. In response to Japanese protests Russian sources said that the release had been authorized by the Ministry of the Environment in Moscow and that the IAEA and the International Maritime Organization (IMO), which administers the 1972 International Convention on the Prevention of Marine Pollution by Dumping Waste and Other Matters (the London Convention), as well as the governments concerned, had been duly informed in advance. In fact, environmental groups accuse the IAEA of having failed to give timely warning to the Russians that their action would violate the London Convention. The Agency has claimed that it was up to the IMO to do so and that its own role was that of giving technical advice.

  Subsequently, the Russian Environment Ministry confirmed it had issued a license for the discharge, in light of the fact that the port where the waste was stored risked being seriously contaminated; a uniform discharge of liquid wastes at sea had been expected to have little or no effect on marine life.

  Apparently unheedful of calls by Japan for the dumping to stop right away, Russian officials initially said they would have to continue the practice. However, after further formal demarches by Japan and by other countries, including New Zealand and the Republic of Korea, supported by the United States, Russia announced it would suspend the dumping, but added that unless it got help to build a waste processing factory soon it would have no choice but to resume. Russia's Minister for Atomic Energy on 26 October followed up with a statement in Tokyo that there would be no more dumping of low-level liquid radioactive waste into the Japan Sea. He said that the practice was deemed scientifically safe, however, and that the two countries would jointly take samples at the dump sites to ascertain this. More recently, again, the Commander of the Russian Pacific Fleet said that dumping would have to go on until some better way of disposal was found. This has since been denied by the Commander-in-Chief of the Russian Navy.

  The situation reportedly results from the fact that the tankers used to hold liquid radioactive waste at Pacific Fleet bases are 'full to overflowing'. Japan and Russia are now consulting on possible joint action. Apparently, the possibility is considered of using part of the funds Japan has reserved for the dismantling of Russian nuclear weapons to help Moscow construct a waste processing installation. Japan and Norway have agreed to set-up a monitoring system for radioactive sea-dumping; they hope to associate other countries in this effort. In January 1994, a marine survey is planned of dumping sites in the Sea of Japan, by scientific personnel from Japan, South Korea, Russia and possibly the IAEA, which has offered its assistance in the area.

  At the 16th Consultative Meeting of the Contracting Parties to the London Convention, held at IMO headquarters in London on 8-12 November, attended by 42 of the 71 parties, a decision was taken to turn the non-binding moratorium on ocean dumping of low-level radioactive waste that was adopted in 1983, into a formal ban, as proposed by Denmark. The proposal was backed by the United States, although the U.S. Navy — as reportedly also the navies of France and the UK, had opposed it. Japan, which on previous occasions had not been for a ban, now supported it. Belgium, China, France, Russia and the United Kingdom abstained in the vote and now have 100 days to register an objection, failing which the new rule will take effect also for them. Russia has reportedly said that if it received the necessary financial and technical help it would be able to

comply; as matters stand, it is said to be the view of the Russian Navy that, given the lack of storage space for further liquid waste and the fact that land-based processing installations now being built will not be ready until 1997, it will have to resume ocean-dumping in about 18 months. There is international concern that if it does, material will fetch up in a disposal zone in the Arctic Ocean, which apparently has an especially sensitive ecosystem. Parties to the London Convention have agreed to set up a team of experts who will help Russia assess its waste-storage requirements.

Officials in Tokyo have acknowledged that Japan has been dumping radioactive waste from nuclear installations in its own territorial waters. Although this does not contravene the London Convention and the radiation levels so far are said to have been in conformity with international standards, the Japanese Atomic Energy Commission has decided to halt the practice. (**Atoms in Japan**, Vol. 37, No. 10, October, No. 11, November; **Sankei Shimbun**; 8 October, 11/12 November; **Associated Press**, October 17; **The Guardian, Kurier, United Press International**, 18 October; **International Herald Tribune**, October 18, 22; **Financial Times**, October 18, 19, 20, 22; **Asahi Shimbun** 18, 20, 29 October, 5 November; **Die Welt**, 18, 19, 20, 22 October; **Die Presse, Standart, Le Monde**, all 19 October; **Frankfurter Allgemeine Zeitung**, 19, 20, 22, 27 October; **Sankei Shimbun**, 20 October; **Washington Post, Nihonkeizai Shimbun**, 21 October; **Nucleonics Week**, October 21, 28, November 4, 11, 18; **ENS-NucNet**, 21, 27 October; **The New York Times**, October 22, November 2, 13, December 5; **The Times [London]**, 22 October; **Neue Zürcher Zeitung**, 22, 23 October, 4 November; **Süddeutsche Zeitung**, 23 October, 4, 5 November; **Mainichi Shimbun**, 29 October; **Time**, November 1; **Associated Press**, November 3; **Christian Science Monitor**, November 4)

b. NPT Events

- **Guyana** deposited its instrument of accession to the NPT on 19 October; **Mauritania** did so on 26 October. A list of the states party to the NPT as of 31 December 1993 is given under **V. Documentation**, starting on page 22.

- The President of **Argentina** has stated that his country will ratify the NPT in 1995. (**Nucleonics Week**, December 9)

- On 13 December **Khazakstan**'s parliament, which earlier ratified START-1, approved the country's accession to the NPT by a vote of 238 to 1. During the visit of U.S. Vice President Gore to Alma-Ata on the same date, a so-called 'safe, secure dismantlement agreement' (SSD) was signed with respect to the 108 SS-18 intercontinental ballistic missiles in Kazakhstan, enabling the release of $85-million from the United States for this purpose. President Nazarbayev had already made it known that he did not intend to use his nuclear weapons to gain leverage for Western assistance, but he is also reported to have said that in giving them up he will expect the West to help guarantee the security of his country. Nationalist groups in Kazakhstan are said still to advocate keeping the weapons to protect the nation's independence, but the President's political position is seen as strong enough to deter such moves. (**International Herald Tribune**, October 25, 26; **The Independent, Süddeutsche Zeitung, Die Welt**, 25 October; **Nucleonics Week**, November 4; **Associated Press**, December 13; **The New York Times** and **Washington Post**, December 14)

c. Other Non-Proliferation Developments

- **Argentina**'s Chamber of Deputies has ratified the Treaty of Tlatelolco; the Senate had done so earlier. (**Financial Times**, November 12)

- **Brazil**'s lower house of Parliament, the House of Deputies, has approved the quadripartite agreement with **Argentina, ABACC** (the Argentine-Brazilian Agency for Accountancy and Control of Nuclear Materials) and the **IAEA** on safeguards, the amendments to the Treaty of Tlatelolco that should permit the country to let that Treaty enter into force, and an agreement regarding the rights and responsibilities of ABACC. The Brazilian Senate is expected to approve these agreements shortly. ABACC has already made a number of inspections at sites in both countries and discussions are under way on subsidiary arrangements for IAEA safeguards. (**Nuclear Fuel**, October 11; **Nucleonics News**, October 28)

- According to a report from Tokyo, **Japan** is seeking to establish a uniform Asian technology export regime that would in the first instance include the six ASEAN countries: **Brunei, Indonesia, Malaysia, the Philippines, Singapore** and **Thailand**. (**Defense News**, November 1-7)

- Following on his proposal to the U. N. General Assembly, for a world-wide phased-in end to the production of high-enriched uranium and plutonium (see **Newsbrief** No. 23, 3rd Quarter 1993, pp. 5 and 23-24), **United States** President Clinton has proposed applying comprehensive IAEA safeguards to all nuclear material in the United States that is not earmarked for nuclear weapons. A condition for the implementation of this offer is the acceptance by India, Israel and Pakistan of safeguards on their future nuclear activities. It has been reported that the U.S. Administration will consider an informal request by Germany to transfer its separated plutonium to the United States, to be put under safeguards there. German industry would then reportedly be able to cancel their commitments for further reprocessing in France and the United Kingdom.

The US Defense Authorization bill for fiscal year 1994 and the accompanying congressional conference report contain a number of provisions aimed at strengthening US non-proliferation policies. Among them is a 'sense of the Congress' (non-binding) resolution that reprocessing civilian spent fuel may pose serious environmental and proliferation hazards; a provision barring funds for Russia to build a plutonium storage facility until it can be certified that Russia has halted plutonium recovery from civilian reactors; stronger nuclear export controls; and funds for plutonium disposition.

On 22 November the US Senate confirmed John D. Holum as director of the Arms Control and Disarmament Agency. Mr. Holum was a member of the

law firm of Secretary-of-State Warren Christopher. During the presidential campaign he worked as defence and foreign policy advisor to candidate Clinton, having been on the State Department Policy Planning staff for several years, working, among other things, on issues of arms control. (**Nucleonics Week**, October 14; **NuclearFuel**, November 22, December 20; **Arms Control Today**, Vol. 23, No. 9, November)

- At a meeting held in The Hague, the Netherlands, on 17 November, the **Coordinating Committee for Multilateral Export Controls (COCOM)** decided that the organisation (made up of Australia, Belgium, Canada, Denmark, France, Germany, Greece, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Turkey, United Kingdom and the United States) should be replaced by an export-control body of wider membership and a different focus. It is deemed likely that East European states and possibly China and Russia will be invited to join. Rather than serving, as hitherto, to impede economic development in states with ideologies that were considered undesirable, the new organisation will focus on exports to proliferation-prone countries, of weapon related technologies. (**Financial Times**, November 11, 16; **International Herald Tribune**, November 13; **Wall Street Journal**, November 17).

d. Nuclear Testing

- On 5 October, at 0200 hours local time, **China** set off a nuclear test explosion at its Lop Nor test site in the north-western province of Xinjiang. The yield of the device is estimated at 80-90 kilotons. The test, which was the first since the start of a *de facto* nuclear testing moratorium one year earlier, has raised concern about the possibility that the other four nuclear-weapon states might similarly resume their tests. The Chinese decision to test in disregard of the moratorium has evoked world-wide expressions of regret and of fear that other nuclear-weapon states might likewise resume testing. Among governments most vocal in expressing their regrets at China's action were those of Argentina, Brazil, Japan, Mexico, Mongolia, Republic of Korea, Russia, and the South Pacific Forum on behalf of its fifteen member states; Cuba and Singapore defended it. Beijing explained the test as necessary for national defence, said that further testing could not be excluded, called the foreign criticism unfair and pointed out that China had always shown great reticence in testing, and had carried out few tests compared with the number made by other nuclear-weapon states. According to a spokesman for the Chinese foreign ministry Beijing continued to support the conclusion of a comprehensive test ban. Among the wide media coverage, speculation in the press that the test might not have been carried out if China had been selected for the Olympic Games of the year 2000, or that it had been triggered by various other non-technical considerations, is generally discounted. Recent U.S. comments concede that the test appears to have been made as part of the development of small, deployable, accurate warheads for use in a new-type ICBM. The test is said to have been first made known by the London-based *Verification Technology Information Centre*. (**Press Release** from UN Mission of PR China, New York, 5 October; **VERTIC Press Release**, October 5th; **Associated Press** [London], 5 October; **Daily Telegraph**; **The Guardian**; **The Times** [London]; **Financial Times**; **The Independent**; **The New York Times**; **The Washington Post** — all 6 October; **Le Monde**, 6 and 7 October; **Süddeutsche Zeitung**, 6 and 8 October; **International Herald Tribune**, October 6, 14, November 10; **Frankfurter Allgemeine Zeitung**, 6 and 13 October; **Neue Zürcher Zeitung**, 7 October; **Die Welt**, 8 October; **Trust and Verify** [VERTIC Bulletin], No. 41, October)

- In **France**, the news of the Chinese test followed the publication of the findings of a committee set up by Defence Minister Léotard and headed by the chief of staff of the French armed forces that the current moratorium hampered warhead modernisation and that France would have to resume testing within two years. France is developing new warheads for submarine-launched and long-range ground-to-air missiles, and was widely expected to resume testing before the end of the year. Reportedly, however, President Mitterand and Prime Minister Balladur have agreed not to take any decision in the matter for the time being; in a joint communique they have called for consultations with the other three nuclear-weapon states to examine the consequences of the Chinese event. Comments from Paris add that the Chinese test has not basically altered the situation, since Beijing had never undertaken to suspend its tests. However, concern appears to have been raised in Paris at reports that there may be an understanding between Beijing and Washington, under which China would conduct a hurried series of tests and would then join the other nuclear-weapon states in agreeing to a CTBT in 1996. Minister Léotard, who had said earlier that a resumption of French tests would depend on whether experts saw a need for them, rather than on decisions made by other states, has been quoted in the French press as saying that France's security is not endangered by a brief suspension of tests, but that it could not continue indefinitely without testing. French weapons experts apparently hold that ten to twenty more tests will be needed to enable them to develop laser and computer technology to simulate testing; the same claim was made by the Gaullist politician Chirac. Minister Léotard, who was apparently less specific, has spoken of the need to make a limited number of small tests and is quoted as saying that until these had been completed France would not be able to sign a global test ban treaty. Prime Minister Balladur has also told the National Assembly that France could not endorse a permanent test ban as long as it feels the need for testing in order to maintain the credibility of its nuclear deterrence. While the suspension of tests has brought some savings, keeping the testing establishment in Polynesia in working order reportedly will cost FFr. 2 billion for the year 1994. Dispositions are said to be in place for a series of five tests. (**La Libération**, 13 September, 6, 7, 8, 9 October; **The Independent**, 1 October; **Le Monde**, 4, 7, 8 October, 10 November; **The Guardian**, 6 October; **Nucleonics Week**, **Financial Times**, October 7; **Le Quotidien de Paris**, 7 and 9 October; **International Herald Tribune**, October 7 and 8; **Neue Zürcher Zeitung**, 8 October; **Reuter's** [Paris], October 8; **Süddeutsche Zeitung**, 9 October; **Wall Street Journal** and **Kurier**, 14 October; **Süddeutsche Zeitung** and **Neue Zürcher Zeitung**, 15 October; **Agence France Presse**, 7 October, in **JPRS-TND-93-034**, 27

October; **The Washington Post National Weekly Edition**, December 13-19)

- **Russia** has announced that, despite the Chinese test, it would continue to observe the moratorium on nuclear testing. It called on other nuclear powers to do likewise. In a statement circulated as a document of the UN General Assembly the Russian Federation 'nevertheless' reserves its right to revise its decision 'if further unfavourable developments occur in this sphere'. It has been confirmed from Kazakhstan that since 1989 — when the President of the country closed the testing site at Semipalatinsk and terminated all nuclear tests there — a nuclear device has been buried there. Scientists are trying to find out how best to eliminate the device; they seem to rule out the possibility of a spontaneous explosion. (**International Herald Tribune**, October 22; **ITAR-TASS**, 29 October, 4 November, in **JPRS-TND-93-036**, 17 November)

- Shortly after it became known that China had carried out a nuclear test, it was announced in the **United States** that President Clinton had ordered the Department of Energy to 'take such actions as are needed' to resume US tests next Spring. Initial indications were, however, that no decision had been taken to resume testing soon, and that the White House did not wish the Chinese test to interfere with America's broader goal of a comprehensive test ban.

  The Department of Energy has decided to declassify a large quantity of previously secret information on nuclear weapons, including data on undisclosed nuclear tests. It has been disclosed that there have been 252 secret American tests, in addition to the 1,051 that were made public: 204 in Nevada, and the remainder in the Pacific; the last undisclosed test was carried out in 1990. The yield of some of these tests was very small; others were large enough to have been readily noticed in the USSR. One point of concern is that the 18 unannounced tests that were made during the Reagan and Bush Administrations do not seem to have registered on the sensitive seismological monitoring equipment then in place. (**White House Report**, October 5; **International Herald Tribune**, October 6; **The New York Times**, November 11, December 8; **The Times** [London], the **Financial Times**, **The International Herald Tribune**, all December 8; **The Washington Post National Weekly Edition**, December 13-19)

e. Nuclear Trade and International Cooperation

- **Argentina**, whose relations in the nuclear area with a number of Western countries, notably the US, appear to have greatly improved lately, is said to seek membership in the Nuclear Energy Agency of the OECD. (**Nucleonics Week**, October 28)

- **Canada** is talking with **Ukraine** about possibilities for nuclear commerce, under which Ukraine would supply zircalloy, heavy water or other materials. Ukraine is said to show interest in Canada's pressurised heavy-water Candu-600 reactors, but it would be unable to get any until it is subject to full-scope IAEA safeguards. (**Nucleonics Week**, November 25)

- **China** will receive a centrifuge enrichment plant from the **Russian Federation**, with an initial capacity of 200,000 SWU/yr. The plant, which will work with the latest-model subcritical centrifuges, will be built at the joint venture complex at Shenzen, near Hong Kong, as part of a Sino-Russian agreement of 1992 which also provides for the sale of VVER-type power reactors. Construction is to start in 1994. The Russian nuclear ministry, Minatom, will build the plant and reportedly will not transfer the technology; thus, China would not be able to raise the enrichment level above 4%. Damaged centrifuges will be destroyed on the spot or sent back to Russia. The enriched uranium is intended in the first place for use in the 300-MW power reactor at Qinshan. Eventually, it is hoped to expand plant capacity so as to provide fuel also for the two French 1,000-MW reactors at Daya Bay. (**NuclearFuel**, October 11; **Enerpresse**, 15 October)

- In **Egypt**, construction of the research reactor supplied by **Argentina** is reported to have started. (**MENA** [Cairo], 28 September, in **FBIS-NES-93-187**, 29 September)

- **Indonesia** has been offered assistance by **Australia** in the development of its nuclear energy programme. The country is reportedly making a preliminary feasibility study of a nuclear power station in Java, comprising two 600-MW units. (**Melbourne Radio Australia**, 1 September, in **JPRS-TND-93-029**, 17 September; **ENS NucNet**, 13th October)

- The supply of power reactors to **Iran** by **China** and the **Russian Federation** appears to be slow. One reason is said to be funds still need to be found. The question of siting also seems to cause delay, since much of Iran is in an earthquake zone. Possible sites mentioned for the Chinese units are Bushehr, where a seismic evaluation was made by Siemens AG, and Darkhouin, which French experts had reportedly found to be suitable for a reactor-power project that is no longer under discussion. (**ENS NucNet**, 5th October; **Nucleonics Week**, October 14)

- **Israel** is accused by the United States of selling a large quantity of high-technology military equipment of US origin to **China**, in disregard of American attempts to restrict the supply of such items to Beijing. Prime Minister Yitzhak Rabin has said that the Israeli arms sales did not violate restrictions on the transfer of American weapons technology and that claims as to the amount of money involved (apparently by the CIA in an assessment given to the US Senate) were incorrect. (**The Independent**, 13 October; **The New York Times**, October 13 and 14; **Financial Times**, October 14; **International Herald Tribune**, October 14, 16; **Neue Zürcher Zeitung**, 15 October)

- **Japan** has concluded an agreement with the **Russian Federation** to assist it in five areas relating to the dismantling of nuclear weapons: storage of nuclear material from dismantled weapons; research in the peaceful use of such material; the application to it of IAEA safeguards; management of environmental effects; and disposal of liquid fuel from scrapped missiles. Also agreed was a memorandum to promote

cooperation in the field of nuclear safety, pursuant to a decision taken at the 1992 economic summit of the seven most developed industrial nations (G-7), at Munich. Both items are among those discussed at the October meeting in Tokyo between President Yeltsin and Prime Minister Hosokawa. (**Nucleonics Week**, October 14; **Atoms in Japan**, Vol. 37, No.9, October. See also above, **a. Background**, on dumping of radioactive waste)

- **Russia** has reportedly cancelled its contract with **Lithuania** for the supply of fuel for the (2 X 1,500-MW RBMK) Ignalina power plant, because Lithuania has not yet paid for earlier supplies. (**Nucleonics Week**, October 7)

- **Pakistan** and the **Russian Federation** have signed an agreement for cooperation in the applications of nuclear energy for peaceful purposes. (**Rawalpindi radio**, 14 September, in **JPRS-TND-93-030**, 27 September)

f. IAEA Developments

- At a meeting of the Board of Governors on 2 December, the Director General announced that the Agency will again be obliged by the substantial arrears of some Member States to cut its programme in 1994 by 12 percent. (**IAEA Press Release**, PR 93/25, 2 December)

g. Peaceful Nuclear Developments

- Over the next ten years **Argentina** plans to meet its expected power deficit by building small (350–450MW) nuclear stations. The head of the National Commission for Atomic Energy has said that these could be funded by the Commission, without recourse to foreign capital. (**Noticias Argentinas** [Buenos Aires], 29 August, in **JPRS-TND-93-029**, 17 September)

- **Belarus**, half of whose electricity is supplied from RBMK-type reactors in Lithuania, Russia and Ukraine (Chernobyl), is looking for greater energy-independence by operating its own reactors. Faced with problems of financing the purchase of Western reactors, it is now reportedly thinking of buying one or two Russian VVER-400 units. (**Nucleonics Week**, October 28)

- **Brazil** has decided not to complete the third reactor unit at Angra dos Reis. This was to have been a 1,300-MW reactor, supplied by Siemens AG under the 1975 agreement with Germany. Angra-2, which had been scheduled for completion in 1982, is now expected to come on line in 1997, with German assistance. Brazilian scientists are working on laser enrichment of uranium; the work is hampered by a lack of funds. (**Gazeta Mercantil** [Sao Paulo], 7-8 September; **Deutsche Presse Agentur** [Hamburg], 7 October; **Enerpresse**, 12 October; **Voz do Brazil**, 8 October, all in **JPRS-TND-93-034**, 27 October)

- There is a report that **Bulgaria** plans to have all units of the Kozloduy nuclear power station back in service in January 1994. The station comprises six Soviet-supplied reactors: two first-generation VVER-440/230 units and two second-generation VVER-440s; units 5 and 6 are newer VVER-1000 versions. It is recalled that the safety features of all six reactors have been upgraded with Western help. The European Bank for Reconstruction and Development (EBRD) has reportedly assisted in particular with the upgrading of the two oldest units, on condition that they should not be operated beyond 1998. Kozloduy-1 was expected to receive before end-1993 a provisional license to operate until May 1994, at which point it is to undergo further tests. Kozloduy-2 was restarted about a year ago, and until that unit is shut down in late January, for refuelling and further backfitting, all six reactors will be in operation at the same time. Reportedly, there is dissatisfaction in the western nuclear community that its help is used to keep unsafe plants going rather than to prepare them for shutdown. (**The New York Times**, November 28; **Nucleonics Week**, December 9, 23; see also PPNN's **Newsbrief 22**, Spring 1993)

- The two partially completed VVER-440 reactors at Juragua in **Cuba**, on which construction was halted in 1992 when Russia reportedly demanded $200 million to continue construction, will be mothballed. Russia has advanced $30 million to Cuba for this purpose. (**Nucleonics Week**, 30 September)

- **Egypt** says it has discovered four granite deposits in Sinai and the eastern desert which contain exploitable quantities of uranium. Production is planned to start under the present five-year economic plan. (**Al-Jumhuriya** [Cairo], 7 September, in **JPRS-TND-93-030**, 27 September)

- In **France**, the commission inquiring into the economic, technical and environmental aspects of relicensing the 1,240-MW fast reactor *Superphenix* has recommended that it be given permission to resume operations, barring objections of the safety authorities, particularly with regard to sodium fires. France's Economic and Social Council has also advised the government to allow the restart. The French government will probably not decide on the matter until the middle of next year. Anti-nuclear and environmentalist groups, reportedly incensed by the commission's findings, which they call slanted and based on false information, are combining for a massive effort against moves to permit the reactor to operate next year. Reportedly, a German consulting firm employed by *Greenpeace France* has seriously criticized the safety evaluations so far presented for the reactor. (**ENS NucNet**, 1 October; **La Libération**, 1 October; **Neue Zürcher Zeitung**, 2 October; **Le Monde**, 2, and 3 October; **Die Welt**, 4 October; **Nucleonics Week**, October 7, November 18, December 16; **The Guardian**, 29 October)

- In **Germany**, for the past seven months, negotiations were held between the government coalition, the anti-nuclear social-democratic opposition, the utilities and the nuclear industry about the future of the country's nuclear programme. Principal issues appear to have been whether Germany would use MOX fuel and, if so, whether this would be manufactured domestically or abroad, and when and how a decision to construct new power reactors would be taken. In October a consensus seemed to be near, which would entail, *inter alia*, an end to reprocessing of irradiated fuel in favour of direct disposal (at a site still to be determined); ending the working life of current reactors after 35-40 years; the

construction of one advanced and inherently safe 1,500-MW reactor by the year 2005, if the need is clearly established and a decision is taken with a two-thirds majority in both houses of parliament. Late that month, however, the opposition rejected the plan, and consultations were suspended indefinitely. The government coalition now reportedly hope to go it alone, by seeking an amendment of the Federal Atomic Law that would incorporate major features of the previous plan. Whether and when this can be done is said not to be entirely certain, so that for the time being it appears hard to predict the future of Germany's energy industry. (**Frankfurter Allgemeine Zeitung**, 23, 27, 29 October; **Süddeutsche Zeitung**, 23 October; **Financial Times**, October 25, 27, 29; **Die Welt**, 25, 27, 29 October; **Nucleonics Week**, October 28, November 4; **ENS-NucNet**, 29th October)

- **India** has concluded a short-term interim safeguards agreement with the IAEA, under which safeguards will continue with respect to the *Tarapur* power station after the expiration of the tri-partite agreement with the United States on 24 October. Discussions between India and the United States about the continuation of safeguards on the plant, and on the question of extracting the plutonium from the fuel irradiated there and using it in MOX fuel for use in the reactors, have not yet led to agreement. The deadline has been extended to 28 February 1994. The disagreement affects the negotiations between India and the IAEA on a new long-term safeguards agreement. (**The Hindustan Times**, 23 October, in **JPRS-TND-93-036**, 17 November; **NuclearFuel**, January 3, 1994; **Direct information** from IAEA)

- The director general of the National Atomic Energy Agency of **Indonesia**, Djali Ahimsa, has confirmed plans for the construction of a 1,200-MW nuclear power station in Central Java. Plans reportedly call for the award of the construction contract to be made in 1995, with completion foreseen for 2003. (**Tempo** [Jakarta], 11 September, in **JPRS-TND-93-031**, 8 October)

- **Japan** has for the first time published comprehensive figures for the amount of plutonium it owns. In a reply to a question by a member of the Lower House of the Diet, the Science and Technology Agency announced on 1 October that as of the end of 1992, Japan's total holding of plutonium (extracted from spent nuclear fuel and purchased abroad) was 8,230 kg fissile equivalent: 4,820 kg extracted abroad from irradiated fuel, 485 kg bought abroad and 2,925 kg reprocessed domestically. Deducting plutonium spent or made into fuel (including 1,140 kg at the 'Monju' prototype fast-breeder reactor, 1,070 kg at the experimental fast reactor 'Joyo', 980 kg at the advanced thermal reactor 'Fugen' and 524 kg for research) Japan currently had about 4,500 kg, of which 2,900 kg was stored overseas and 1,630 kg was in Japan: 570 kg at the Tokai reprocessing plant plus the 1,060 kg reprocessed in France and brought to Japan earlier this year. (It was pointed out in the statement that as a result of plutonium decay and rounding, the figures for storage and in-use do not quite match the amount given for total supply.)

  Fuelling of the Monju reactor started on 13 October. MOX fuel fabrication for Monju, which had been halted for technical reasons in June, resumed earlier that month. Fabrication of the original fuel load should be completed by February 1994, and loading is scheduled to be complete by June. (**Atoms in Japan**, Vol. 37, No. 10, October; **ENS-NucNet**, 8th October; **Nucleonics Week**, October 14; **Kyodo** [Tokyo], 1 October, in **JPRS-TND-93-034**, 27 October)

- In the **Slovak Republic**, the completion of two VVER-440/213 power reactors at Mochovce seems to hinge on whether the government will drop its plans for major backfitting of the two older VVER-440/230 reactors at Jaslovske Bohunice, which were approved for operation until 1995, after upgrading work in 1991–93. There are reports that these units may have to be kept running longer than foreseen, as construction at Mochovce seems to be behind schedule. Completion of the Mochovce plant is to be financed mainly through the European Bank for Reconstruction and Development, but many of the countries involved, particularly Austria which has long demanded the shut-down of Bohunice, just across the border from Vienna, say that they do not agree to financing Mochovce unless the older plant is closed. A recent opinion poll in the area of Mochovce, has shown that 57% of those questioned were in favour of more nuclear power. The Slovak government claims it needs both stations and says that Bohunice can be upgraded to European standards. An Austrian delegation recently met with Slovak nuclear authority personnel to discuss the safety upgrading at Bohunice. (**Nucleonics Week**, November 11; **ENS NucNet**, 16 November, 6 December)

- **Sweden**'s Prime Minister has said that a decision on decommissioning the country's nuclear power plants should be deferred until 2000, but the utilities call for a decision within five years, to help them decide on modernisation plans. The deadline of 2010 for the shutdown of all power reactors, adopted by referendum in 1980 and later enacted by Parliament remains valid; however, following various compromises it is no longer certain that these measures will be carried out as initially foreseen. Domestic discussions continue. (**Nucleonics Week**, October 28)

- The speaker of the Parliament of **Ukraine** has said that his country needs nuclear energy as it lacks alternative power sources, and has intimated that Ukraine aims at self-sufficiency in the nuclear fuel cycle.

  On 20 October, the Supreme Soviet of Ukraine reversed its earlier decision to put the Chernobyl power station out of operation by the end of the current year and repealed the 5-year moratorium on the construction of nuclear power stations which it had adopted in 1990. Reportedly, ever since the decision to end operations at Chernobyl, first by 1995 and later, after a fire in the ancillary equipment of unit 2, in 1993, there had been pressure to go on using units 1 and 3, which were still operational and in 1992 had undergone major backfits. The acute shortage of fossil fuel seems to have tilted the scale in favour of their continued operation. The new decision does not include a deadline for closure. It was initially expected that the two operational units would be

kept running until they could be replaced by new VVER-1000 reactor units, at Zaporozhe (where unit 6 should start up in 1994), Rovno 4 and Khmelnitsky 2 (scheduled for start-up in 1995), Khmelnitsky 3 and 4 and South Ukraine 4 (which are to come on line between 1995 and 1998). There now is talk of trying to keep the two Chernobyl units going until the end of their scheduled life, which would be around 2002 and 2006, respectively. Some experts, however, do not see how Chernobyl-1 could last beyond 1998 and Chernobyl-3 beyond 2001, even with further substantial upgrades. There is now also said to be a plan to repair Chernobyl-2, where the 1991 fire took place. The decision to keep units 1 and 3 running and to consider repairing unit 2 is said to be behind the resignation of the deputy head of Ukraine's nuclear regulatory authority. The news of the decision has been widely covered in the Western press and has caused perturbation among environmentalists within Ukraine — where the Environmental Protection Ministry had pleaded for an early closure — and outside. U.S. officials have expressed serious concern about the safety of all operational RBMK reactors, especially Chernobyl units 1 and 3, which they feel should be shut down without delay. They recognise, however, that this is not likely until there are some energy alternatives. French experts also call for the urgent replacement of the two units by more reliable reactors now under construction. In Germany, both the government and the parliamentary opposition have repeated their calls for the urgent shutdown of the entire Chernobyl station. There is also concern about physical security of the station, following events such as the theft, last October, of some fuel elements from a defective assembly, and the repeated unimpeded circling of the plant at low altitude by a commercial aircraft.

The World Health Organization has found that as the apparent result of the spread of radioactive iodine caused by the 1986 Chernobyl disaster, the incidence of thyroid cancer among children is growing 'dramatically'. Reportedly, WHO has said that since 1989, there were 225 new cases among children in Belarus, where two or three might be expected under normal circumstances. In Ukraine there are 158 cases.

There is concern about the security at Ukraine's nuclear power plants. Following the theft of some uranium control rods from Chernobyl, the head of security of Ukraine's nuclear power stations is quoted describing 'dangerously lax conditions and sloppy standards'.

An **Austrian** press report speaks of a dispute with Ukraine about the latter's supply of electricity under a bilateral agreement of 1992: Austria had expected to pay for the supply in goods and services, while Kiev now insists on hard currency. No solution is expected for the next two years.

Meanwhile no contract has yet been awarded for the construction of the second 'sarcophagus' around the remains of Chernobyl unit 4. There is a suggestion that the six top contenders in last summer's competition might be asked to do the job together. The Nuclear Energy Agency (NEA) of the OECD has plans to hold an international safety review to help Ukraine adopt criteria for the project. (**Uryadovyy Kuryer** [Kiev], 7 September, in **JPRS-TND-93-030**, 27 September; **ENS NucNet**, 5th October; **Nucleonics Week**, October 7, 21, 28; **ENS NucNet**, 21st October, 19th November; **Reuter's**, 21 October; **Der Standart**, **Die Presse**, **Salzburger Nachrichten**, **Frankfurter Allgemeine Zeitung**, **International Herald Tribune**, **The New York Times**, **Financial Times**, **El Pais** [Madrid], **The Independent**, **Libération** — all 22 October; **Kurier**, 22 and 23 October; **Le Monde**, 23 October; **Enerpresse**, 26 October; **Kyyivskyy Visnyk**, 28 October, and **Kievskiye Novosti**, 30 October, in **JPRS-TND-93-036**, 17 November; **Associated Press**, October 28, 29; **Daily Telegraph**, 30 October; **Nuclear Engineering International**, November; **The Washington Post**, November 12; **Nucleonics Week**; November 18, December 9)

- In the **United Kingdom**, the state-owned utility, Nuclear Electric, proposes to build two 1,300-MW power reactors at Sizewell, in Suffolk, at an estimated cost of £3.5 billion. They would replace the first-generation magnox units at the site, which are to be phased out by the turn of the century. Government approval is not expected until the conclusion of a forthcoming review of nuclear power in Great Britain.

On 15 December, the British government gave its approval to the operation of the THORP reprocessing plant at Sellafield. The decision followed long and intensive efforts of national and international environmental groups, British politicians and local authorities, and Japanese and American parliamentarians, to persuade the government not to do so. The British Secretary of State for the Environment, John Gummer, has tightened the limits on the amount of radioactive material that may be discharged from the plant and start-up could be as early as 17 January 1994 — there is a period of 28 days for appeals to be made against this decision. There is doubt in Europe and the United States about the economic viability of reprocessing, given the present plutonium glut. U.S. President Clinton had earlier rejected an appeal by members of Congress to ask the British government to keep THORP from operating. The President said that, while he saw the civil use of plutonium as not justified on economic or national security grounds and thought its accumulation 'creates serious proliferation and security dangers', he had not called for a ban on all fissile material production because that would 'breach existing U.S. Commitments'. Similarly, the appeal by members of Congress to the Secretary of Energy, to turn down a request from Switzerland to approve the shipment to THORP of irradiated fuel (of U.S. origin) from its *Beznau* reactor station, is expected to be refused because the Swiss move is consistent with U.S. non-proliferation policy. With the breakdown of consensus in Germany about a future energy policy there is said to be some doubt that much German fuel will go to THORP for reprocessing, although one major German utility group has stated that it will adhere to its reprocessing contracts. THORP's operator, BNFL, is reportedly seeking affidavits to this effect from foreign clients, to use against the claim, expected to be made shortly in the British High Court by *Greenpeace* and the Lancashire County Council, that in its decision to authorise THORP to operate the

government improperly neglected the economic aspects. Sweden, which was expected initially to be one of THORP's customers, is apparently no longer planning to make use of its services. Japan's nuclear industry has continued to express support for THORP but the prospect that, given the large plutonium stocks held in Japan, separated Japanese plutonium would have to be stored at Sellafield has caused concern in the United Kingdom. There is talk in the British press of the possibility of selling plutonium to South Korea. Nordic governments have expressed concern about the environmental risks created by THORP and the governments of Denmark, Ireland, the Netherlands, Norway and Sweden are said to have questioned the U.K. government about the European legal implications of allowing the start-up without an environmental impact assessment. Apparently, however, the European Commission has ruled that since such assessments are required for activities receiving development consent after 3 July 1988, and THORP received consent before that date, no assessment is required. BNFL has said that the delay in the start-up will cause a 3% increase in operating costs. (**NuclearFuel**, October 11, November 22, December 6; January 3, 1994; **Enerpresse**, 12, 18 October, 9 November; **Financial Times**, October 14, November 15, December 11, 16; **ENS NucNet**, 18th October, 10th November, 15th, 16th December; **Daily Telegraph**, 21 October; **The Guardian**, 20, 22 October; **The Washington Post**, November 12, December 16; **The New York Times**, December 16; **Nucleonics News**, December 16; **The Guardian**, December 16; **The Times** [London], December 16; **The Independent**, 15, 16 December)

- The **United States** Congress, in a vote of 282 against 143, has cut-off funds for the Superconducting Super Collider project. Originally estimated at $4.4 billion, projected costs increased to $5.9 billion in 1989 and $11 billion this year. So far, $2 billion have been spent and 14 miles of tunnel were built at Waxahachie, Texas, representing 20% of the project. Meanwhile, the European Centre for Nuclear Research (CERN) near Geneva is planning to build an 'atom smasher', the 'Large Hadron Collider', at a cost of $1.5 billion, which is expected to answer many of the same fundamental questions which the American project would have sought to solve. It is hoped that the United States will participate in this activity.

  The Nuclear Regulatory Commission is considering a rule under which nuclear power plants must have barriers to protect them against intrusion by vehicles for the purpose of causing damage.

  Scientists at Princeton University have set off several fusion pulses with a reported peak power of 5.3 MW, the largest fusion reactions produced so far. By introducing increasing amounts of deuterium and tritium, the operators of the Tokamak fusion test reactor hope to raise the power to 10 MW by the end of 1994. The tests are said to take twice as much power as they produce. Scientists hope that the break-even point, where the power produced equals that consumed in the test, may be reached in the next generation of fusion reactors, but observers warn that commercial application of nuclear fusion is still 'decades and billions away'. (**Financial Times**, October 28; **Time** and **Newsweek**, November 1; **Energy Daily**, November 5; **The New York Times**, December 10, 11; **The Economist**, December 18th)

h. Weapons-related Developments in Nuclear-Weapon States

- **China** is believed to have 100 land-based missiles: 50% more than previously estimated. According to *Military Balance 1993–1994*, published by the International Institute for Strategic Studies (IISS) in October, the total is made up of 14 intercontinental missiles and about 90 intermediate-range missiles. (**Financial Times**, October 13)

- As part of a 'new military doctrine' **Russia** has abandoned its pledge not to be the first to use nuclear weapons in an armed conflict, and to use nuclear arms for defence only. Defence Minister Grachev announced on 3 November that Russia would not use nuclear weapons against any non-nuclear-weapon state party to the NPT, but reserved the right to be the first to use nuclear weapons if it or any of its allies was attacked by a non-nuclear-weapon state allied to a nuclear-weapon state. The new doctrine does not mention attacks by nuclear-weapon states, which is taken to imply also that Russia has dropped its no-first-use undertaking. Observers see Gen. Grachev's statement as connected to the present disarray in the armed forces in the Commonwealth of Independent States and as a reminder to potential adversaries such as China that Russia is ready to use nuclear weapons in defence of its territory and that of other former Soviet Republics. In the West, the announcement is not taken as an important shift in strategy, since the no-first-use doctrine, promulgated by Brezhnev in 1982, was generally seen as propaganda, meant to play on Western anti-nuclear sentiment, rather than reflecting actual policy. In fact, Soviet strategy appeared to be quite the opposite.

  A senior scientist at the *Brookings Institution* in Washington, a former missile launch control officer, claims that the USSR in the 1970s developed a computerised system to launch strategic weapons in a war, if the commanders are out of action. This 'dead-hand' system is said to be capable of automatically commanding emergency communication rockets to transmit launching orders, complete with 'unlock' codes, to ICBMs stationed anywhere on the territory of Russia, Belarus, Kazakhstan or Ukraine, including mobile missiles on truck-towed launchers, without further orders from commanders in the field or participation of local crews. U.S. sources reputedly believe that the system is still in place and operational. In a press conference he gave in Rome in early November, the Russian Defence Minister, Gen. Pavel Grachev, called the report 'science fiction'. American reports speak of similar measures having been taken in the United States, where, they say, nuclear weapons on strategic bombers could be detonated automatically, should the crews be disabled.

  Newspaper reports describe Russia's continuing effort to modernise its nuclear forces. While current efforts are said to be 'modest' compared to those of the Cold War era, and Russian commentators speak of further reductions to come, there are three new missiles under

development: a silo-based missile, a mobile missile to replace the single-warhead SS-25, and a new submarine-launched missile. Dismantling is said to proceed slowly. American newspapers cite a CIA estimate according to which Russia has 27,000 warheads, and is dismantling 2,000 a year, but this appears difficult to verify.

Various United States sources have expressed doubt at reports [see **Newsbrief 23**, p. 17] that Russia had made 15,000 more warheads than originally estimated.

In an undated interview with a Moscow periodical, Russia's Minister for Atomic Energy, Mikhaylov, said that his Department employs about 1,000,000 people, and that about 15% of the work relates to military activities; the nuclear arms complex of Russia incorporates ten 'closed cities' housing 700,000 people in all.

Reports have surfaced again about the large-scale exposure of Soviet army forces to Soviet atomic tests, in the Arctic, in Kazakhstan and elsewhere. In one exercise, in 1954, 45,000 soldiers and thousands of civilians are said to have been exposed to a 20-kiloton air burst over the town of Totskoye, in the Ural Mountains. Reports of experiments to see how military personnel would function when exposed to radiation from atmospheric tests have also come out of France, which allegedly conducted such experiments in Algeria, and the United States, which apparently did so in Nevada and the South Pacific, but in none of these are the exposures thought to have been as long or as intense as in the Totskoye event.

The international expedition which last summer investigated the radiation hazards caused by the wrecked Soviet submarine *Komsomolets* has managed to take deep-water samples and carried out a full inspection of the wreck, by means of manned submersibles and remotely operated robots. Members of the investigating team are quoted as saying that the submarine cannot be raised and that there is a possibility that in the next year or two, plutonium will start leaking from the torpedoes. The reactor is not thought to present a threat. Plans are being made to encase the wreck in an absorbent gel (another report speaks of filling the torpedo room with this substance). (**Nezavisimaya Gazeta**, 18 August, in **JPRS-TND-93-029**, 17 September; **The New York Times**, October 8, November 3, 4, 7, 29, December 1; **The Washington Post**, October 9; **The Independent**, 9 October; **The Times** [London], October 9, November 4; Moscow Radio, 27 September, and **ITAR-TASS** [Moscow], 11 October, in **JPRS-TND-93-034**, 27 October; **La Libération**, 4 November; **Moscow Ostankino TV**, 21 October, in **JPRS-TND-93-035**, 10 November; **La Republica** [Rome] and **Izvestiya**, both 4 November, in **JPRS-TND-93-036**, 17 November; **Associated Press**, November 16)

- As part of its efforts to reduce the military budget, the **United Kingdom** government has announced that it would abandon plans to build a new sub-strategic nuclear missile for the Royal Air Force, the so-called Tactical Air to Surface Missile or 'TASM'. It was to have been carried by *Tornado* aircraft. Thus, once the present free-fall WE-177 bomb system is phased out, the Royal Navy, with its submarine-launched *Trident* missiles, will be the only branch of Britain's armed forces to have nuclear weapons. The move has been the subject of heated debates in Parliament. The government has also announced that the *Trident* II D-5 missiles to be deployed on the four new submarines that will be introduced into service between 1994 and 1997, will have about the same total explosive force as the present *Polaris* missiles. While the four *Polaris* boats now in service carry 16 missiles, believed to carry three warheads each, for a total of 48 warheads per submarine, each *Trident* missile — which has over twice the range of the *Polaris* missile and is much more accurate — is capable of carrying eight warheads in the British system, for a possible total of 128 warheads on each submarine and an overall number of 512 warheads for the four. However, the number of *Trident* warheads carried in each of the four new *Vanguard* submarines will be kept at 96 or less, and there is even talk of a total of 200 warheads for the entire fleet. Altogether, the government foresees that by the time all four *Trident* submarines are operational, the nuclear explosive firepower of the U.K. inventory of nuclear weapons will be cut by 25% from the 1990 figure. Reportedly, all sea-based and land-based tactical nuclear warheads have already either been destroyed or been returned to the United States. (**Financial Times**, 16, 19 October, 15, 17 November; **Daily Telegraph**, 16, 19 October, 16 November; **The Times** [London], October 16, 19, November 16; **Jane's Defence Weekly**, 30 October, 27 November; **Le Monde**, 17 November; **Press Associa- tion** [London], 18 October and **Agence France Presse**, 25 October, in **JPRS-TND-93-035**, 10 November; **The Guardian** and **The Independent**, 19 October, 16 November; **The New York Times**, November 16; **Süddeutsche Zeitung**, 16 November)

- The **United States** Administration has begun a comprehensive review of its nuclear strategy and forces: the first since National Security Decision Directive 13 of 1981, which still determines US nuclear policy. The review reportedly involves a reconsideration of the future role of nuclear weapons, including the doctrine of deterrence, and will design the long-term structure and posture of the American nuclear arsenal, taking account of such consideration as the demise of the Cold War and its 'balance of terror', but also of the possible emergence of Ukraine as a nuclear-weapon state, and of other newly nuclear countries that may not be susceptible to the traditional means of deterrence. As one outcome of the review, the Department of Defense has developed a so-called Counterproliferation Initiative to deal with what Secretary Aspin called the 'new nuclear threat' of 'a handful of nuclear devices in the hands of rogue states or ... terrorist groups'.

  Hoping to reduce the risk of accidental launchings, the U.S. Department of Energy is reportedly preparing to aim its strategic nuclear missiles into the Arctic or North Atlantic Ocean, away from their traditional targets. Talks are said to be underway with Russia on mutual de-targeting, as one of a series of measures to reduce nuclear tensions. Although hard to verify and relatively simple to reverse, the move is seen as an important 'gesture'.

The defence appropriations bill for 1994 contains a recommendation for a 'top-to-bottom' review of the nuclear-weapons programme of the Department of Energy (DoE). The report calls the management of the programme outdated and in need of re-examination and says that the management structure needs to be overhauled.

In what critics see as a contradiction of the position announced by Washington several months ago, when it said it had rejected the 'broad interpretation' given to the Anti-Ballistic Missile (ABM) Treaty by the Reagan Administration [see **Newsbrief 23**, page 7], the U.S. Administration now proposes 'updating' that treaty, so as to allow the use of anti-missile interceptors to protect the country from attacks by medium-range missiles from third states. American officials have apparently suggested to the Russians that the Treaty should be interpreted as excluding only interceptors that have the capacity of shooting down missiles travelling at 3 miles a second or more. The standard used so far has been to prohibit interceptors that can shoot down missiles travelling at, or faster than, 2 miles a second. American arms control experts see the proposal undercutting the fundamental purpose of the ABM Treaty.

In an apparent departure from the traditional 'high-alert' posture, the Department of Defense has begun unilaterally to implement START-I by removing more than 3,000 warheads from missiles for which the launchers are to be eliminated. Once START-II is ratified and implemented, the United States is expected to deploy about 3,500 of its present total of 8,000 warheads on strategic missiles. With respect to a Russian suggestion that both states should take their strategic missiles off alert, Washington's position is said to be that Russia should also first deactivate the missiles covered by START-I.

According to a report of the General Accounting Office (GAO), plans to dismantle 2,000 American nuclear weapons a year at the Pantex facility near Amarillo, Texas, reducing present stockpiles to 3,500 by the year 2003, are too ambitious and must be scaled back. According to the report as quoted in the press, the inherently hazardous disassembling process is complicated by the presence in older weapons of high-explosives sensitive to heat and shock, creating a risk of detonation which might scatter radioactive material. In some, plutonium pits are cracked and radioactive gas may escape. In 1992, only two thirds of the quota was met, and in an attempt to maintain the schedule, tests for the safety of weapons in the arsenal are said to have been reduced, raising concern that the rush to disassemble the weapons is put ahead of occupational and environmental safety.

As part of its new policy of greater openness, DoE has disclosed that in all, the United States had produced 89 metric tons of plutonium. Seven of its facilities had plutonium stockpiles totalling 33.5 metric tonnes; the amount of material at the Pantex plant in Texas, where stocks are still used for weapons, was not disclosed. In what is taken to be a sign that the government itself has been unaware of some of these matters, the Secretary of Energy has stated that the figures might be revised later, as more material is discovered during clean-up. The storage of excess fissile material is becoming a serious problem, particularly in the long term. So far, no long-term storage scheme for plutonium has been agreed upon. Although no weapons-grade plutonium has been produced in the United States since the 1980s, stockpiles are growing as more nuclear weapons get dismantled. Other reports speak of an acute problem involving the irradiated fuel from production reactors, which has been stored at Hanford, Savannah River and Idaho Springs, in anticipation of the extraction of plutonium and tritium. The cooling ponds where most of the material is stored were designed for a storage limited to about 18 months, and it is reported that, after many years of storage, the aluminium cladding of the fuel elements is corroding and the uranium itself is rusting, along with the ancillary equipment: racks, cranes and cables. In some cases metal parts are said to be badly deformed. While some material is apparently safe from corrosion in dry casks, some is said to be buried in steel cylinders that are also prone to rusting. Some more is said to have been buried underground, without DoE knowing precisely where.

There have been changes in the clean-up plans for the Hanford nuclear reservation. Because the work turns out to be taking longer than expected, the original plans to finish stabilising and vitrifying the high-level radioactive waste in the 177 deteriorating tanks at the site and storing it at Yucca Mountain in Nevada by the year 1999, have been pushed back to 2009. However, DoE will at the same time embark on the clean-up of low-level waste which accounts for 90% of total waste volume at the site and may spread through seepage and water pollution. The deadline for the over-all clean-up has been extended from 30 to 40 years. The total cost of the project is not known, but in 1989 estimates ranged upwards from $50 billion for a programme of smaller scope.

In a report released in early December, the Senate Governmental Affairs Committee contends that at eleven American nuclear-weapon facilities there is a risk of explosions in processing tanks similar to the one at the Russian production plant at Tomsk-7, last year.

DoE has found that it has been paying contractors engaged in clean-up at nuclear-weapon sites a third more than private industry spends on comparable jobs. In an effort to reduce cost overruns and delays, the Department has said it will resume the management of the programmes and that, although it would have to hire more staff, it hopes to save $360 million in 1995, and more in years to come.

Transcripts have been made public of last year's congressional hearing into a settlement between DoE and Rockwell International, the operator of the Rocky Flats weapons plant, under which that company paid a $18.5 million fine and pleaded guilty to ten violations of environmental laws, including five felonies, but no individuals were prosecuted. The decision not to prosecute the company's executives was made by senior officials of the Justice Department, and there is talk of the possibility that members of the grand jury which dealt with the case, and who reportedly saw a conspiracy

between DoE and Rockwell, will be called to testify before the US Congress.

The decision to terminate weapon production at Rocky Flats is setting off a large-scale decontamination effort at the plutonium facilities there. The work concentrates on the clean-up of contaminated buildings and on assuring safe storage of the plutonium which is there now and reportedly presents a risk to the workers on the site. Allegedly, however, DoE has ignored a deadline set by federal and state regulators for the submission of plans for the clean-up of environmental problems at and near the site, such as the 'remediation' of groundwater. Observers believe that the incident may move DoE, whose operations have long been characterised by secrecy and unilateral decision-making, to greater openness and cooperation with environmental authorities.

DoE, as the government body responsible for the production of nuclear weapons, is developing a programme assessing the risks posed to public health and to the environment by radioactive and other hazardous waste generated within the nuclear-weapons production complex. The Department is obligated by law to submit by 30 June 1995 a report to Congress evaluating and ranking the priority of such risks to public health. The programme should define the risks that arise at each of 17 sites involved, and, reportedly sensing that its own laboratories and contractors have been discredited in the eyes of the public, the Department has been looking for an outside organisation to which to entrust the task.

The previous U.S. Administration had planned to test the suitability of the new underground waste-storage facility (the 'Waste Isolation Pilot Plant') at Carlsbad, New Mexico, by depositing plutonium-contaminated bomb waste there. DoE has now decided to first undertake a series of laboratory tests of the feasibility of storing high-level, long-lived waste at the site, before any shipments take place. Work on the site is said to have been going on for 20 years and to have cost $1.5 billion so far. While plans had called for the first shipments to the facility to be made in 1994, it may now be unavailable for use until late in the present decade.

The GAO has revealed that in the 1940s and early 1950s, in an attempt to develop a radiation warfare weapon, twelve tests were made in which nuclear materials were released from the air in conventional bombs. Some of the materials dispersed are said to have been particles of long-lived radio-isotopes intended to interdict the use of areas for long periods, while others were to kill enemy soldiers by intense but short-lived radioactivity that would have permitted American troops to enter the area soon after use.

It was disclosed recently that in the late 1940s government scientists subjected large numbers of people to radiation, to study the effects of radioactive contamination on the human body. Latest reports indicate that at least 1,000 people, including patients in military hospitals, were exposed to radiation for purposes unrelated to their health. Various government agencies are said to have been involved, including DoE's predecessor, the Atomic Energy Commission, and the predecessor of the present Defense Nuclear Agency. Among cases currently discussed is that of a group of 87, largely retarded, cancer patients who were subjected to high-level radiation; 18 supposedly terminally ill persons between the ages of 4 and 69, who were injected with plutonium; a number of pregnant women who were given radioactive iron; 200 cancer patients who were exposed to high levels of radiation; a number of prison inmates who were given large doses of X-rays in order to study the effect on fertility; a dozen terminally ill cancer patients who were injected with various radioactive substances; mentally retarded children being fed milk containing radioactive minerals, to help researchers understand how such materials were digested; and newborn babies being injected with radioactive iron, to study the functioning of their thyroid glands. Reputedly, not all subjects, or where minors were involved, their parents, may have given their 'informed consent' for the experiments, or had been fully informed of the risks involved. While there are indications that at the time several scientists raised objections to these studies and warned that they were not ethical, some observers now urge that judgment should be suspended until more is known about the context of the experiments, given the different ethical standards and scientific knowledge of the era. Meanwhile, a special telephone line has been set up at DoE where survivors and family members can get information; reportedly, the Department has already had hundreds of calls. Some cases are said to be already under investigation by the Department of Justice.

The *New York Times* says that the author of an article published last May in the U.S. Army Journal *Military Review*, about the danger of nuclear weapons being delivered by terrorists in a back-pack, has turned out to be a patient in a mental health institute who was committed as a paranoid schizophrenic after killing his mother. (**Associated Press**, October 2, November 15; **The New York Times**, October 3, 8, 22, 30, 31, November 2, 11, 15, 21, 30, December 1, 3, 6, 7, 8, 10, 16, 17, 27, 28, 30; **The Washington Post**, October 4; **NuclearFuel**, October 11, 25, November 8; **Defense News**, October 18-24; **International Herald Tribune**, October 20, November 4; **USIS 'News Alert'**, November 1; **Wall Street Journal**, November 1 and 3 [Frank Gaffney: *Wrong Way to Face the Future Nuclear Threat*]; **The Energy Daily**, November 5, 12, 15, December 8, 10; **Arms Control Today**, Vol. 23, Nr. 10, December; **Memorandum from the Secretary of Defense**, 'The Defense Counterproliferation Initiative', **Washington, DC, December 9; Nucleonics Week**, December 9)

i. Events in the Newly Independent States/former USSR

- **Japan** has adopted a $100-million programme to help **Belarus**, **Kazakhstan**, **Russia** and **Ukraine** dismantle nuclear weapons and clean up radioactive waste sites. Consultations have started with the responsible authorities in the various republics, about implementation of the project. (**Nucleonics Week**, November 11; **Atoms in Japan**, Vol. 37, No. 10, October 1993)

j. Developments of Concern for Horizontal Proliferation

- According to a report by 'a group of Austrian scientists', quoted in a Pakistani newspaper, **India** has about 290 kg of plutonium now and will have 400 kg by 1995, enough to make 65 nuclear bombs. The report says that Pakistan has 200 kg of uranium (presumably highly enriched — Ed.) and could produce 13 bombs (sic). (**The News** [Islamabad], 26 September, in **JPRS-TND-93-031**, 8 October)

- The Iranian news service quotes from the 1993–94 issue of *The Military Balance*, published by the International Institute for Strategic Studies (IISS), which says that there is, as yet, no published proof of the 1992 CIA claim that 'Iran was trying to acquire a nuclear weapons capability'. According to the IISS: '... if Iran does have a nuclear weapons programme, it is still in its early stages. In all probability Iran cannot hope to produce its own nuclear weapons before 2000 at the earliest.' On 15-21 November, an IAEA team headed by the Deputy Director General for Safeguards visited Iran, reportedly to discuss the application of safeguards there and to check on structures at nuclear sites that had not been included in the inventory of facilities provided by Iran, so as to ascertain if any nuclear activities were taking place there of which the Agency should be notified. The team was said to have been given access to all the locations it had asked to visit. It had reportedly sought Teheran's consent to the installation of environmental monitoring equipment that could help detect nuclear activities. An unconfirmed Iraqi press report says that Iran has built a uranium enrichment facility with Indian assistance, and that it has recruited atomic scientists from Azerbaijan, Kazakhstan, Turkmenistan and Yugoslavia. A British source says that four large deposits of uranium have been discovered in Iran. According to a French comment, the slowness with which Iran's nuclear energy plans are realised is due not only to financial problems but to the country's 'well established reputation as a terrorist State'; both China and Russia have been warned by the United States against selling reactors to Teheran. During a visit to Jedda by Germany's foreign minister, Saudi Arabia's King Fahd reportedly expressed his concern about Iran's nuclear plans; apparently the King said that he suspected Iran of seeking to speed up the construction of nuclear power plants in order to produce nuclear weapons. Foreign Minister Kinkel assured the King that Germany would not help Iran complete the Bushehr reactors, and reportedly pointed to the absence of indications from the IAEA that Iran was preparing to produce nuclear weapons. Germany's position on this issue, and its moves to expand its economic and political relations with Iran, seem to annoy the United States, which is trying to isolate Iran as 'an outlaw nation', in the words of Secretary of State Christopher. Reputedly upon the urging of Washington, the government of the Czech Republic is now not likely to allow Skoda Plzen to export pressure vessels to Iran for the reactors it is getting from Russia and China. American officials reportedly see a connection between a 1992 visit to Iran by Czech officials and suggestions that German industry might seek to funnel nuclear technology to Iran via third parties, such as Skoda. The U.K.'s policy with respect to Iran is said to be similar to that of the United States, as is that of Israel, which reportedly keeps a close watch especially on sales by Germany. There are media reports that France, Italy and Japan are reluctant to curb their commerce with Teheran, although apparently Tokyo has made a commitment not to sell equipment to Iran for the reactor China is supplying. It may also be noted that in Italy a public prosecutor recently ordered the confiscation of eight steam condensers that were about to be shipped from Venice, without the special authorization from Rome required for this kind of dual-use items. They are said to have been originally manufactured for Siemens AG. A few months earlier, the same official had six heat exchangers seized that were also destined for Iran. A report from Turkey alleges that Iran is trying to buy uranium and has bought 'red mercury' from Azerbaijan, presumably as a precursor material for the production of lithium. In Istanbul, eight persons have been arrested, including three alleged Iranian agents, and 5 lbs of low-enriched uranium, supposedly of Russian or Armenian origin and destined for Iran, have been seized; Teheran has denied Turkish allegations of the clandestine transfer of nuclear material to Iran. A report in the Arabic-language newspaper *Sharq Al-Awsat*, published in Riyadh and London, and picked up in South Korea and Japan, alleging that the DPRK was planning to test-fire its medium-range missile Nodong-2 in a desert area in Iran, has been categorically denied by the latter. *The Times* of London has published a report that Iran and Syria are developing a low-flying cruise missile capable of carrying chemical or nuclear warheads. Some of the technology is said to come from Germany and Japan. Iran has rejected the claim; it has also denied as 'baseless' reports from Saudi Arabia that it was planning to test-fire a medium-range DPRK-built missile that would be able to target Israel. (**IRNA** [Teheran], 6 October, in **FBIS-NES-93-193**, 7 October; **Milliyet** [Istanbul], 6, 7, 9 October, in **JPRS-TND-93-036**, 17 November; **The Guardian** and **Der Standart**, 7 October; **Jerusalem Post**, 21, 26 October; **Tehran Radio First Program**, 23 October, in **FBIS-NES-93-204**, 25 October; **Enerpresse**, 25 October; **Tercuman** [Istanbul], 8 October, **Iran Radio News**, 12 October, **KBS-1 Radio** [Seoul], 23 October and **IRNA**, 23 October, all in **JPRS-TND-93-034**, 27 October; **Frankfurter Allgemeine Zeitung**, 3 November; **MENA** [Cairo], 29 October, quoting *Al-Qadisiyah* [Baghdad], and **Telefacts** [UK], October, both in **JPRS-TND-93-035**, 10 November; **Al-Shira** [Beirut], 1 November, in **FBIS-NES-93-211**, 3 November; **The Times** [London], November 12; **La Republica** [Rome], 12 November, and **IRNA**, 13 November, in **FBIS-NES-93-218**, 15 November; **The Washington Post**, November 20; **IAEA Press Release** PR/25, 2 December; **The New York Times**, December 2, 16; **Press Release**, Permanent Mission of the Islamic Republic of Iran to the United Nations, 7 December; **Nucleonics News**, December 16)

- In **Iraq** the IAEA and the Special Commission of the Security Council have continued their verification activities pursuant to Resolution 687. Reportedly, during their 21st inspection visit in October, a team of IAEA inspectors used environmental sampling to help ascertain that no clandestine nuclear activities were taking place — inspections of this kind are now said to take place about twice a year. On 26 November, after

months of arguments with the IAEA and the United Nations about the implementation of Resolution 715, which requires Iraq to provide a full inventory of plants and other sites, machinery, equipment and materials that can serve for the production of weapons of mass destruction, Iraq's Foreign Minister informed the President of the Security Council that his government had decided to accept the obligations stated in that resolution and to comply with the provisions of the plans for monitoring and verification. The Executive Director of the Special Commission of the Security Council, Rolf Ekéus, noted, however, that Iraq had still not provided him with all relevant information on its programme for the development of weapons of mass destruction and that it would have to do so before he could assure the Security Council that Baghdad had given up its plans to make such weapons. The Security Council, in response to Iraq's claim that it was now in full compliance with the cease-fire conditions imposed on it after the Persian Gulf War, and that trade sanctions should be lifted, said it could not agree to do so until it was satisfied that Iraq had given a full accounting of its programmes for the production of nuclear, biological and chemical weapons and of ballistic missiles, and had accepted plans for the long-term monitoring of its industries. This was amplified by American official sources as meaning that Iraq would have to demonstrate 'over a sustained period of time its full cooperation with the monitoring and verification regime'; it is not expected, therefore, that sanctions will be lifted in the near future. The refusal by the US Administration to meet with Iraq's Deputy Prime Minister to discuss terms for the lifting of the oil embargo is seen not only as reflecting this view but is also interpreted as a signal to the DPRK that Washington is not weakening in its resolve to halt the spread of nuclear weapons.

The provision of full information by Iraq on its foreign sources of supply has long been a source of dispute with the IAEA and the United Nations: Iraq's persistent refusal to do so has raised suspicions that it seeks to make sure of retaining clandestine sources abroad that would enable it to resume its weapon-production programme at some time in the future. Even now, the Special Commission is seeking the sources of a range of sensitive items of information; Iraq is also suspected of hiding a number of 'SCUD' missiles.

As to the IAEA, almost from the start of its investigations of Iraq's nuclear-weapon programme under Resolution 687 it has sought information from Baghdad on the sources of its nuclear equipment, especially of the technology and materials for the sophisticated ultracentrifuge effort that formed the centre piece of its uranium enrichment programme. In October there were reports that, following a series of meetings between IAEA officials and senior Iraqis in Baghdad and New York, the IAEA was about to report to the Security Council that Iraq was in technical compliance with Resolution 687 and had provided full data on its nuclear procurement programme, including, reportedly, on the sources of information on enrichment equipment and of the materials used in its manufacture. In his speech to the General Assembly on 1 November, Director General Hans Blix stated that based on the 21 inspections and related activities the IAEA had been able to conclude that in all essential aspects Iraq's former clandestine nuclear weapons programme had been mapped and was either destroyed or neutralised. He said that the Agency was in the process of verifying recent information provided by Iraq on suppliers, but that there were still gaps in the IAEA's knowledge about Iraq's nuclear supply and procurement channels and about sources of scientific and technical information. He expressed the hope that on the basis of the information recently provided, the last pieces of the picture would become clear.

There have long been suggestions — since confirmed by Iraqi disclosures and findings of IAEA inspectors — that Germany was the source of much of the technology, equipment and material used in Iraq's nuclear-weapons programme. A report from Bonn, in the bi-weekly American publication *NuclearFuel* of December 6, says that members of the parliamentary opposition have asked the government for clarification of information about exports from Germany to Iraq that has come to light since Chancellor Kohl briefed the parliament in 1991. The government is said to have replied that it saw no grounds for providing further information. The report in *NuclearFuel* refers to the cases of two German experts who supplied Iraq with key technology for centrifuge enrichment (one of these cases is briefly described at the end of this section, Ed.). It also cites Western experts as concluding with 90% certainty that high-grade maraging steel for the manufacture of centrifuge rotors by Iraq came from Germany. Allegedly, the purchase had been arranged by a British resident of Pakistani or Indian nationality, known by the name of Malik, through the Iraq Embassy in Bonn. Steel is said to have been sought from several German companies; other reputable companies supposedly supplied various items of equipment. The Dresdner Bank is said to have handled financial aspects of the transactions.

In the United Kingdom, an inquiry has begun into sales of arms and dual-use equipment to Iraq, in contravention of governmental guidelines on exports, and with the knowledge, and at times active involvement, of senior government officials. The inquiry under Lord Justice Scott has evoked great interest in the British media, who recall similar events in the United States. In the American case, the Reagan White House was said to have been involved in large-scale covert efforts to export weapons and weapons-producing machinery to Iraq. Media interest in that issue was revived recently when a committee of the U.S. House of Representatives heard testimony from the manager of the Atlanta branch of the *Banco Nazionale de Lavoro*, who was sentenced to prison for having arranged loans to Iraq totalling $5-billion, which were reputedly used for weapons purchases. According to his testimony, U.S. authorities were aware of the transaction and actually encouraged it. The British inquiry was triggered by the allegation, made at the trial of three executives of the Matrix Churchill machine tool company who were being prosecuted for the illegal export of machine tools to Iraq, that Whitehall had known about the military use of the equipment when it authorised the sale and had misled Parliament about the matter. Reports about the inquiry so far speak of an apparent eagerness on the part of

officials in the Ministry of Defence to sell military equipment to Iraq, although that ran counter to official export controls. Accusations are heard of the involvement of high-level officials who supposedly condoned that exports were approved even in breach of official guidelines. The investigation has focused *inter alia* on the question whether a former senior Foreign Office official who was influential in the issuance of the required licenses and has since conceded that he 'made a wrong judgment' in approving the Matrix Churchill exports, had been kept in the dark about the illicit nature of those exports, was misinformed by the intelligence service or might have known but did not reveal his knowledge. In December, former Prime Minister Thatcher testified that she had not been informed of the change in export practices, which she called a change of circumstances rather than of policy.

Nucleonics Week has revealed that six months ago a German court of law for the first time handed down a conviction for an illegal nuclear export to Iraq. The case is said to have involved a centrifuge expert and former employee of the German firm MAN Technologien AG (a partner in the Urenco consortium), who as director of a firm exported to Iraq 16 or more carbon fibre rotors designed to be used in a centrifuge uranium enrichment facility, without an export license. Pleading guilty to charges of illegal export activity, he was given a suspended prison sentence of 11 months and fined DM 20,000. His wife, titular head of the firm, was fined DM 15,400.

(**Reuter's**, October 7, 8; **Independent**, 7, 21, 26 October; **Daily Telegraph**, October 7, 13, 26; **The New York Times**, October 7, November 7, 27, 28, December 7, 9; **Financial Times**, October 8, 10, November 10; **The Guardian**, 8, 27 October, 9 November; **The Times** [London], 13, 21 October; The Sunday Times, 17 October; **The Observer**, 17 October, 7 November; **Nucleonics Week**, October 21, November 11, 25; **Frankfurter Allgemeine Zeitung**, 2, 3 November; **The Economist**, December 18th)

- **Israel**'s High Court of Justice has rejected an appeal by Mordechai Vanunu, the technician convicted in 1988 of treason and sentenced to 18 years in jail, for disclosing information about the nuclear-weapons programme conducted at the *Dimona* facility. The appeal, reportedly relating to the conditions of imprisonment, was heard behind closed doors. (**The Jerusalem Post**, 7 September; **The Jerusalem Report**, October 7)

- **Norway**'s radiation protection authorities fear that nuclear material allegedly stolen from a Russian storage facility and supposedly containing substantial amounts of enriched uranium may be smuggled through their country. The Russian newspaper *Iswestija* had reported earlier that a quantity of enriched uranium sufficient for making several nuclear weapons had been stolen from a Russian submarine base. By the time the theft was discovered it was believed that the material might already have been taken out of the country. (**Kurier** and **Salzburger Nachrichten**, 11 December; **Nucleonics Week**, December 23)

- There have been contradictory reports in **Pakistan** about a statements made in September by then interim Prime Minister, Moeen Qureshi, that the country's nuclear programme had been 'capped'. Originally understood by some commentators as meaning that Pakistan would relinquish the nuclear option, it was clarified in subsequent statements which said that there had been no change in the country's nuclear policy and that Pakistan would under no circumstances abandon the nuclear option which was 'essential' for the country's defence. During the election campaign, in September, Benazir Bhutto also, said that the nuclear programme would be continued because Pakistan could not stay out of the running while India had an atom bomb. In a televised address given the day after she assumed the office of Prime Minister, Ms. Bhutto said that she would 'protect' Pakistan's nuclear programme and would not allow its national interest to be sacrificed; this was seen as an assurance to the military that Pakistan would retain its nuclear option, as well as a warning to India. In a letter to the Editor of the *New York Times*, the Press Attaché of the Pakistani Embassy in Washington, confirming a similar statement from a spokesman for the foreign ministry in Islamabad, denied that the Prime Minister had referred to Pakistan's 'nuclear weapons program' because, as he said, 'Pakistan is not building nuclear weapons'. On the other hand, during talks in Tokyo in November, the Foreign Secretary of Pakistan reportedly told Japan's Deputy Foreign Minister that Pakistan would have nuclear weapons capability 'in a short period' but currently had no nuclear weapons, because of political considerations. Shortly after she became Prime Minister, Ms. Bhutto announced that she planned to raise with Washington the question of regional non-proliferation and the cut-off of American assistance pursuant to the 'Pressler amendment'. In early November, U.S. Assistant Secretary of State Robin Raphel had several days of discussions in Islamabad. While these are not thought to have resolved the differences between the two countries, both sides are quoted as feeling that a useful dialogue has been started. Soon after, the Prime Minister announced that Pakistan's nuclear programme had been 'frozen'; she added, however, that there was no intention to undo it — which is an American condition for the resumption of assistance to Pakistan. In a new foreign aid bill recently submitted to Congress, the U.S. Administration proposes to replace the Pressler amendment — in which Pakistan is specifically mentioned — by a provision banning American aid to *any* non-nuclear weapon state that has equipment capable of reprocessing or enriching fissionable material for nuclear weapons, unless it accepts full-scope safeguards. The bill would allow the President to waive economic sanctions against a state that is producing weapons-grade material if he determines this is in the national interest. In a statement of 26 November, the U.S. State Department said that 'Pakistan remains under Pressler Amendment sanctions in accordance with U.S. law', and that even if new legislation was passed without specific reference to Pakistan, Pressler standards would continue to apply to that country. The possibility of a waiver in the new bill is seen to cause concern, however, among supporters of a strict non-proliferation regime. (**International Herald Tribune**, October 21, November 9; **The New York Times**, October 21, November 21, 27, December 2; **The**

Muslim [Islamabad], 30 August, in **JPRS-TND-93-029**, 17, 29 September, in **JPRS-TND-93-034**, 27 October; **Radio Pakistan**, 18 October, and **Islamabad PTV**, 25 October, in **JPRS-TND-93-035**, 10 November; **Arms Control Today**, vol. 23, No. 9, November; **Financial Times**, November 8; **Daily News** [Colombo], November 09; **Le Monde**, 13, 14 November; **Nucleonics Week**, December 2)

II. PPNN Activities

- The PPNN Core Group held its Fourteenth semi-annual meeting from 4–7 November 1993 at the Tourmaline/Topaz Hotel complex, Kandy, Sri Lanka. This meeting was organised on behalf of PPNN by the Mountbatten Centre for International Studies, University of Southampton, United Kingdom and the Bandaranaike Centre for International Studies, Colombo, Sri Lanka and chaired by Ben Sanders, the Executive Chairman of PPNN. Of the Core Group, Olu Adeniji, Djali Ahimsa, Thérèse Delpech, Oleg Grinevsky and Harald Müller were unable to attend.

  On 5–7 November, PPNN held an International Workshop on **South Asia and Nuclear Non-Proliferation**. This was attended by thirteen specialists from Bangladesh, Bhutan, China, India, Nepal, Pakistan, the Russian Federation, Sri Lanka and the United States and representatives of the IAEA and the United Nations. The last part of the workshop was also attended by twelve observers from Sri Lanka.

  The workshop was divided into four sessions — South Asia: the Evolving Context; South Asia and Nuclear Proliferation: Regional Challenges and Responses; South Asia and Nuclear Proliferation: Options for Reinforcement of the Non-Proliferation Regime; and Promoting Regional Co-Operation and Stability. Ten Papers/Presentations were discussed: *The Changed International Politico/Military Environment* by Niaz Niak/Pervais Cheema and by Lawrence Scheinman; *Nuclear Energy Activities in the Region and the Roles of the IAEA* by Pierre Villaros; *The Nuclear Status of the Region* by Niaz Niak/Pervais Cheema; *Global Initiatives to Enhance Regional Confidence and Stability* by Roland Timerbaev; *Intra-Regional Factors Affecting South Asian Stability* by Shamsher Chowdhury; *Regional Initiatives for Confidence Building* by Paikiasothy Saravanamuttu; *Extending the Duration of the Non-Proliferation Treaty: Benefits and Options* by Mohamed Shaker; *Options and Opportunities for New Arms Limitation and Security Initiatives* by Jasjit Singh; and *South Asia, Nuclear Energy and Nuclear Non-Proliferation: Some reflections of the Rapporteur* by John Simpson. In addition, panel discussions were held on *The Global Nuclear Regulatory Regime: Creating a New Consensus — Safeguards and Safety, Nuclear Exports and Trade and Security Assurances*, involving short presentations by Jiri Beranek, Lewis Dunn, David Fischer and Adolfo Taylhardat, and on *How Can Nuclear Rivalry be Avoided, Regional Co-operation Promoted and South Asia Achieve Greater Security and Stability* involving short presentations by Brahma Chellaney, Stephen Cohen, Jayantha Dhanapala and Fan Guoxiang. A bound volume of papers from the workshop will be available in mid-1994.

  Members of the Core Group and participants in the Workshop also took part in three additional events in Colombo on 8 November: a seminar on regional security and non-proliferation attended by ten members of the faculty of the University of Colombo; a media briefing for the local and international press; and a public meeting on security and nuclear proliferation on South Asia at the Bandaranaike Centre. In addition, PPNN's Executive Chairman and Programme Director had a short meeting with the Minister for Foreign Affairs of Sri Lanka, the Hon. A.C.S. Hameed, M.P.

- Ambassador Fan Guoxiang (China) has accepted an invitation to join PPNN's Core Group.

- In 1994 PPNN's plans call for two major briefing meetings on the 1995 NPT Conference, for diplomats and other government officials: one, in Venezuela in early May, for participants from the Americas, and the second in late October/early November, near New York city, for members of delegations to the UN General Assembly. During the Core Group meetings associated with these events, the current non-proliferation situation will be reviewed; on the latter occasion other non-proliferation specialists will be invited.

- **PPNN Study Four**, 'Nuclear Export Controls and Supply Side Restraints: Options for Reform', by Harald Müller and Lewis Dunn was published in October. **PPNN Issue Review No. 2**, 'The future of the IAEA', by David A.V. Fischer was published in December.

- During this quarter, PPNN received pledges of major grants from the Japan Atomic Energy Relations Organization; the John D. and Catherine T. MacArthur Foundation; the Rockefeller Brothers Fund; the W. Alton Jones Foundation, Inc.; and the William and Flora Hewlett Foundation. These grants will enable PPNN to continue its work until the end of 1995.

III. Other Non-Governmental Groups Active in Related Areas

- The Program for Nonproliferation Studies (PNS) at the Monterey Institute of International Studies has initiated a new publication, called *The Nonproliferation Review*. Two previous PNS publications, *Eye on Supply* and *Missile Monitor*, have been merged with *The Nonproliferation Review*, which will be published three times a year. The first issue, of Fall 1993, contains articles by George Bunn and Roland Timerbaev: *'Security Assurances to Non-Nuclear-Weapon States'*, and Tadeusz Strulak: *'The Nuclear Suppliers Group'*; an interview with Leonard Spector: *'Forcible Repentance: Hostile Nuclear Proliferants and the Nonproliferation Regime'*; *'Viewpoints'* by Ben Sanders and Kenneth R. Timmerman; and a *'Chronology of South Africa's Nuclear Program'*, by Zondi Masiza.

  For information, contact Christopher C. Fitz, Program for Nonproliferation Studies, Monterey Institute of International Studies, 425 Van Buren Street, Monterey CA 93940, phone [408] 647-4193; fax [408] 647-3519.

- The Fourth Freedom Forum and the University of Notre Dame's Joan B. Kroc Institute for International Peace Studies are to hold a conference at Notre Dame on 8–10 April entitled 'Bombs, Carrots, and Sticks: Economic Sanctions and Nuclear Non-Proliferation'. Topics to be discussed include the relevance of sanctions instruments to non-proliferation; lessons of the UN weapons monitoring mission in Iraq; and the prospects for using carrots and sticks to curb proliferation in South Asia and the Middle East.

  For further information contact Jennifer Glick, Fourth Freedom Forum, 803 North Main St., Goshen, IN 46526, USA, phone: (219) 534 3402, fax: (219) 534 4937.

IV. Recent Publications

- Books:

McGeorge Bundy, William J. Crowe and Sidney D. Drell, *Reducing Nuclear Danger - The Road Away From the Brink.* Council on Foreign Relations Press, New York, 1993, 107 pp.

Charles S. Grace, *Nuclear Weapons: Principles, Effects and Survivability, Land Warfare: Brassey's New Battlefield Weapons Systems and Technology Series Vol. 10,* (London, Brasseys, 1993), 146 pp.

Peter van Ham, *Managing Nuclear Non-Proliferation Regimes in the 1990's*, (London: Pinter, 1993), 128 pp.

'The International Atomic Energy Agency and Arms Control', *Encyclopedia of Arms Control and Disarmament, Vol. 1*, (Charles Scribener and Sons, 1993).

Albert Legault and Michel Fortmann, *Proliferation et Non-Proliferation Nucleaires, Strategies et Controles*, (Centre Quebecois de Relations Internationales, Universite Laval, Canada, 1993, 496 pp.

Harald Müller, Ed., *European Non-Proliferation Policy 1988-1992*, Peace Research Institute, Frankfurt, 1993, 259 pp.

J.B. Poole and R. Guthrie, Eds., *Verification 1993: Peacekeeping, Arms Control and the Environment*, (London: VERTIC/ Brassey's, 1993), 334 pp.

Special Studies Series, *Nuclear Weapons, Arms control, and the Threat of Thermonuclear War, Sixth Supplement, 1991–1992*, (Bethesda, University Publications of America, 1993).

Carin Atterling Wedar, Sven Hellman and Karin Söder,Eds., 'Towards a Nuclear-Free World', *Swedish Initiative for the Prevention of Nuclear Proliferation Risks and New Nuclear Threats*, Stockholm, Sweden, 1993, 288 pp.

United Nations Office for Disarmament Affairs, *Disarmament and National Security in an Interdependent World*, Disarmament Topical Papers 16, Material presented at a Conference held in Kyoto, Japan, April 1993, 231 pp.

United Nations, *New Realities: Disarmament, Peace-Building and Global Security*, Excerpts from the panel discussions organized by the NGO Committee on Disarmament, Inc., at a conference held at the United Nations in New York, 20–23 April 1993, 397 pp.

- Articles and Other Materials:

David Albright, 'Engineer For Hire', *The Bulletin of the Atomic Scientists*, **49**(10), December 1993, pp. 29–36

David Albright, Frans Berkhout and William Walker, 'The Control of Surplus Plutonium and Highly Enriched Uranium', *Bulletin For Arms Control*, No. 12, November 1993, pp. 15–22.

Gary Bertsch and Suzette Grillot, Eds., 'U.S. Security Interests in the 1990s', Proceedings of *The University of Georgia Russell Symposium*, with a section on 'The Threat of Weapons Proliferation in the 1990s'. Center for East-West Trade Policy, the University of Georgia, Athens, Georgia, 1993, 46 pp.

Christopher Bluth, 'Nuclear Safety and Nuclear Ambitions in Ukraine - A Recipe for Catastrophe', *Bulletin For Arms Control*, No. 12, November 1993, pp. 5–8.

George Bunn, 'The Relic of the Cold War is Testing, not a Treaty Banning Testing', *IGCC Newsletter*, **IX**(2), Fall 1993, p 5.

Andre Buys, 'The Conversion of South Africa's Nuclear Weapons Facilities', *Bulletin For Arms Control*, No. 12, November 1993, pp. 9-13.

Brian G. Chow, 'Emerging National Space Programmes, Economics and Safeguards, Santa Monica', *RAND National Defense Research Institute*, Santa Monica, CA 90407, 1993, 67 pp.

Brian G. Chow and Kenneth A. Solomon, 'Limiting the Spread of Weapons-Usable Fissile Materials', report prepared for the Under Secretary of Defense for Policy under *RAND's National Defense Research Institute*, Santa Monica, CA 90407, 1993, 95 pp.

Avner Cohen, 'Did Nukes Nudge the PLO?', *The Bulletin of the Atomic Scientists*, Vol. 49, Nr. 10, December 1993, pp. 11–3

Richard P. Cronin, 'Pakistan Aid Cut-Off: US Nonproliferation and Foreign Policy Considerations', *CRS Issue Brief*, (IB 90149), 3 November 1993, 15 pp.

Zachary Davis and Warren H. Donnelly, 'International Atomic Energy Agency: Strengthen Verification Authority?', *CRS Issue Brief*, The Library of Congress, November 3, 1993, 11 pp.

Martin J. DeWing, 'The Ukranian Nuclear Arsenal: Problems of Command, Control, and Maintenance', Program for Non-proliferation Studies, *Working Paper No. 3*, Monterey, October 1993, 30 pp.

Lewis A. Dunn, 'NPT 1995: Time to Shift Gears', *Arms Control Today*, **23**(9), November 1993, pp. 14–9

John Edmonds, 'At Last the End of Nuclear Testing', *Bulletin of Arms Control*, No. 11, August 1993, pp. 2-7.

Executive Editor, 'NPT after 1995 — Steps Toward Elimination of Nuclear Weapons', *Plutonium*, No. 3, October 1993, pp. 1–7

Sergei P. Galaka, 'Ukraine's Nuclear Dilemma', *Bulletin of Arms Control*, No. 11, August 1993, pp. 17–20.

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John C. Hopkins, 'The Comprehensive Test Ban Debate: a Relic of the Cold War', *IGCC Newsletter*, **IX**(2), Fall 1993, p 4.

Sean Howard, 'Ukraine Presents Draft Treaty to Nuclear Weapons States', & 'Doubts Remain Over Start 1 Despite Ukranian Ratification', *BASIC Reports*, No. 35, 29 November 1993, 5 pp.

Ryukichi Imai, 'Nuclear Weapons in the Former Soviet Union', *Plutonium*, No. 3, October 1993, pp. 18–32.

Sandra J. Ionno, 'Nuclear Testing — A View From Washington', *Bulletin of Arms Control*, No. 11, August 1993, pp. 7–11.

Sergei Kiselyov, 'Ukraine: The View from Kiev', *The Bulletin of the Atomic Scientists*, **49**(9), November 1993, pp. 6–8

Sergei Leskov, 'Ukraine: The View from Moscow', *The Bulletin of the Atomic Scientists*, **49**(9), November 1993, pp. 8–10

Eric Nelson, 'Hanford: Startup is Cleanup, says Energy', *The Bulletin of the Atomic Scientists*, **49**(10), December 1993, pp. 6–7

'Nuclear Weapons: Views from Paris, London, and Beijing', *IGCC Newsletter*, **IX**(2), Fall 1993, pp. 1–4.

Hisahiko Okazaki, 'Thoughts on the North Korean Nuclear Issue', *The Korean Journal of National Unification*, Special Edition 1993, November,pp. 23–9

John Pike, 'Strategic "Deception" Initiative', *Arms Control Today*, **23**(9), November 1993, pp. 3–8

Tariq Rauf, 'The Extension of the Non-Proliferation Treaty in 1995: Strengthening the Global Norm', *Communique, Canadian Centre for Global Security*, October 1993, 4 pp.

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John Simpson, 'Regional Approaches Offer Non-Proliferation Benefits', *Atom*, September/October 1993, pp. 29–32.

Chris Smith, 'Security, Sovereignty and Nuclear Weapons in South Asia', *Faraday Paper No. 20*, The Council For Arms Control, 41 pp.

Oleg Strekal, 'Ukraine: Westward ho!', *The Bulletin of the Atomic Scientists*, **49**(9), November 1993, pp. 10–1

Waldo Stumpf, 'South Africa: Nuclear Technology and Non-Proliferation', From Our Readers, *Security Dialogue*, **24**(4), pp. 455–62.

'The Administration's Non-Proliferation And Export Control Policy: An ACA Briefing With Jack Mendelsohn, Spurgeon M. Keeny, Jr., Zachary Davis and Lora Lumpe, *Arms Control Today*, **23**(9), November 1993, pp. 9–13.

US Congress, Office of Technology Assessment, 'Proliferation of Weapons of Mass Destruction: Assessing the Risks', *OTA-ISC-599*, Washington, DC: US Government Printing Office, August 1993, 115 pp.

Washington Council on Non-Proliferation, A Luncheon Briefing and Discussion, 'Disarming Iraq: Preparing for the Long Term Monitoring of Iraq's Nuclear Weapons Capability', October 26, 1993, 28 pp.

V. Documentation

NPT Parties
[as of 31 December 1993]

Country	Date Signed	Date Ratification Deposited	Date Accession Deposited
Afghanistan	1 July 1968	4 February 1970	
Albania			12 September 1990
Antigua and Barbuda			17 June 1985
Armenia			15 August 1993
Australia	27 February 1970	23 January 1973	
Austria	1 July 1968	27 June 1969	
Azerbaijan			22 September 1992
Bahamas			11 August 1976
Bahrain			3 November 1988
Bangladesh			31 August 1979
Barbados	1 July 1968	21 February 1980	
Belarus			22 August 1993
Belgium	20 August 1968	2 May 1975	
Belize			9 August 1985
Benin	1 July 1968	31 October 1972	
Bhutan			23 May 1985
Bolivia	1 July 1968	26 May 1970	
Botswana	1 July 1968	28 April 1969	
Brunei			26 March 1985
Bulgaria	1 July 1968	5 September 1969	
Burkina Faso	3 March 1970	3 March 1970	
Burundi			19 March 1971
Cambodia			2 June 1972
Cameroon	17 July 1968	8 January 1969	
Canada	23 July 1968	8 January 1969	
Cape Verde			24 October 1979
Central African Republic			25 October 1970
Chad	1 July 1968	10 March 1971	
China, People's Republic of†			9 March 1992
Colombia	1 July 1968	8 April 1986	
Congo			23 October 1978
Costa Rica	1 July 1968	3 March 1970	
Cote d'Ivoire	1 July 1968	6 March 1973	
Croatia			29 June 1992
Cyprus	1 July 1968	10 February 1970	
Czech Republic	1 July 1968	22 July 1969	
Denmark	1 July 1968	3 January 1969	
Dominica			10 August 1984

Dominican Republic	1 July 1968	24 July 1971	
Egypt	1 July 1968	26 February 1981	
El Salvador	1 July 1968	11 July 1972	
Equador	9 July 1968	7 March 1969	
Equatorial Guinea			1 November 1984
Estonia			7 January 1992
Ethiopia	5 September 1968	5 February 1970	
Fiji			14 July 1971
Finland	1 July 1968	5 February 1969	
France†			3 August 1992
Gabon			19 February 1974
Gambia	4 September 1968	12 May 1975	
Germany	28 November 1969	2 May 1975	
Ghana	1 July 1968	4 March 1970	
Greece	1 July 1968	11 March 1970	
Grenada			2 September 1975
Guatamala	26 July 1968	22 September 1970	
Guinea			29 April 1985
Guinea-Bissau			20 August 1976
Guyana			19 October 1993
Haiti	1 July 1968	2 June 1970	
Holy See			25 February 1971
Honduras	1 July 1968	16 May 1973	
Hungary	1 July 1968	27 May 1969	
Iceland	1 July 1968	17 July 1969	
Indonesia	2 March 1970	12 July 1979	
Iran, Republic of	1 July 1968	2 February 1970	
Iraq	1 July 1968	29 October 1969	
Ireland	1 July 1968	1 July 1968	
Italy	28 January 1969	2 May 1975	
Jamaica	14 April 1969	5 March 1970	
Japan	3 February 1970	8 June 1976	
Jordan	10 July 1968	11 February 1970	
Kenya	1 July 1968	11 June 1970	
Kiribati			18 April 1985
Korea, Democratic People's Republic of			12 December 1985
Korea, Republic of	1 July 1968	23 April 1975	
Kuwait	15 August 1968	17 November 1989	
Laos	1 July 1968	20 February 1970	
Latvia			31 January 1992
Lebanon	1 July 1968	15 July 1970	
Lesotho	9 July 1968	20 May 1970	
Liberia	1 July 1968	5 March 1970	
Libyan Arab Jamahirya	18 July 1968	26 May 1975	
Liechtenstein			20 April 1978
Lithuania			23 September 1991
Luxembourg	14 August 1968	2 May 1975	
Madagascar	22 August 1968	8 October 1970	
Malawi			18 February 1986
Malaysia	1 July 1968	5 March 1970	
Maldive Islands	11 September 1968	7 April 1970	
Mali	14 July 1969	10 February 1970	
Malta	17 April 1969	6 February 1970	
Mauritania			26 October 1993
Mauritius	1 July 1968	8 April 1969	
Mexico	26 July 1968	21 January 1969	
Mongolia	1 July 1968	14 May 1969	
Morocco	1 July 1968	27 November 1970	
Mozambique			12 September 1990
Myanmar, Union of			2 December 1992
Namibia			7 October 1992
Nauru			7 June 1982
Nepal	1 July 1968	5 January 1970	
Netherlands	20 August 1968	2 May 1975	
New Zealand	1 July 1968	10 September 1969	
Nicaragua	1 July 1968	6 March 1973	
Niger			4 September 1992
Nigeria	1 July 1968	27 September 1968	
Norway	1 July 1968	5 February 1969	

Panama	1 July 1968	13 January 1977	
Papua New Guinea			13 January 1982
Paraguay	1 July 1968	4 February 1970	
Peru	1 July 1968	3 March 1970	
Philippines	1 July 1968	5 October 1972	
Poland	1 July 1968	12 June 1969	
Portugal			15 December 1977
Qatar			3 April 1989
Romania	1 July 1968	4 February 1970	
Russian Federation*†	1 July 1968	5 March 1970	
Rwanda			20 May 1975
Saint Kitts and Nevis			22 March 1993
Saint Lucia			28 December 1979
Saint Vincent and The Grenadines			6 November 1984
San Marino	1 July 1968	10 August 1970	
Sao Tome and Principe			20 July 1983
Saudi Arabia			3 October 1988
Senegal	1 July 1968	17 December 1970	
Seychelles			12 March 1985
Sierra Leone			26 February 1975
Singapore	5 February 1970	10 March 1976	
Slovak Republic			1 January 1993
Slovenia			7 April 1992
Solomon Islands			17 June 1981
Somalia	1 July 1968	5 March 1970	
South Africa			10 July 1991
Spain			5 November 1987
Sri Lanka	1 July 1968	5 March 1979	
Sudan	24 December 1968	31 October 1973	
Suriname			30 June 1976
Swaziland	24 June 1969	16 December 1969	
Sweden	19 August 1968	9 January 1970	
Switzerland	27 November 1969	9 March 1977	
Syrian Arab Republic	1 July 1968	24 September 1969	
Tanzania, United Republic of			7 June 1991
Thailand			2 December 1972
Togo	1 July 1968	26 February 1970	
Tonga			7 July 1971
Trinidad and Tobago	20 August 1968	30 October 1986	
Tunisia	1 July 1968	26 February 1970	
Turkey	28 January 1969	17 April 1980	
Tuvalu			19 January 1979
Uganda			20 October 1982
United Kingdom*†	1 July 1968	27 November 1968	
United States of America*†	1 July 1968	5 March 1970	
Uruguay	1 July 1968	31 August 1970	
Uzbekistan			7 May 1992
Venezuela	1 July 1968	25 September 1975	
Vietnam			14 June 1982
Western Samoa			17 March 1975
Yemen	23 September 1968	14 May 1986	
Yugoslavia	10 July 1968	4 March 1970	
Zaire	22 July 1968	4 August 1970	
Zambia			15 May 1991
Zimbabwe			26 September 1991

* Depository State † Nuclear Weapon State

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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