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Programme for Promoting Nuclear Non-Proliferation, Newsbrief, Number 18

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Summary:

A compilation of the latest news, events, and publications related to nuclear weapons and nuclear non-proliferation. The "Newsbrief" was produced by the PPNN and personally edited by Ben Sanders.

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PROGRAMME FOR PROMOTING NUCLEAR NON-PROLIFERATION

Number 18

NEWSBRIEF

Summer 1992

Editorial note

This issue of the *Newsbrief* refers to developments related to the non-proliferation of nuclear weapons that took place, or came to the editor's attention, during April/June 1992.

The quarterly *Newsbrief* is published by the Programme for Promoting Nuclear Non-Proliferation (PPNN), as part of its effort to help deter the spread of nuclear-weapon capabilities, by fostering a wider awareness of that phenomenon. PPNN's *Newsbrief* seeks to present an accurate and balanced picture of current events relating to the spread of nuclear weapons to additional states. Besides giving information on moves to counter that spread and on developments in international relations that may help constrain it, the *Newsbrief* refers to relevant aspects of the peaceful uses of nuclear energy.

PPNN's *Newsbriefs* are based on publicly available information derived from reputable and generally reliable sources, which the editor deems to warrant the readers' attention. As editor of the *Newsbrief*, the Executive Chairman of PPNN is responsible for its contents. The inclusion of an item does not necessarily imply the agreement of the members of PPNN's Core Group collectively or individually, either with its substance or with its relevance to PPNN's work.

Subheadings used in the *Newsbrief* are meant to facilitate presentation and assist clarity. Related items of information may be clustered under one subheading, although they might also fit into separate categories of subjects identified in the *Newsbrief*. For instance, the approval by the Parliament of the Democratic People's Republic of Korea of the safeguards agreement with the IAEA and the subsequent submission of its inventory of nuclear facilities are mentioned under 'Developments of Concern to Horizontal Proliferation', because of their relevance to the reports about North Korea's alleged nuclear-weapon ambitions. Similarly, the wide variety of relevant events in the Commonwealth of Independent States – except for developments in respect of peaceful uses of nuclear energy that also involve other eastern European nations – are referred to under a single

subheading, so that they may be more easily seen to be part of the same context.

The limited size of the *Newsbrief* makes it necessary to choose among items of information and to present them in condensed form. 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 encouraged to send their remarks to the editor for possible publication.

Unless otherwise stated, sources referred to date from 1992.

I. Topical Developments

a. Background

- In May, a draft treaty banning the development, production, stockpiling and use of chemical weapons was submitted to the Conference on Disarmament (CD) in Geneva. The compromise text, which is said to be about 80% complete and is the result of lengthy negotiations in the CD and its predecessors, is believed to be acceptable to most of the 39 CD members. To meet American wishes, its verification procedures are less intrusive than was first thought desirable by Western negotiators, including the USA itself. Once formally accepted, the text should go to the UN General Assembly for endorsement, and be opened for signature around the end of the year. Entry into force will follow signature and ratification by 65 states. The Hague has been selected over Vienna as the site of the organization responsible for the verification of compliance with the treaty. One question is whether Middle Eastern countries will be prepared to give effect to a ban on chemical weapons if Israel does not renounce its supposed nuclear arms. (*Defense News*, June 15-21; *Die Presse* and *Der Standard* [Vienna], 20 June; *The New York Times*, June 25; Amy E. Smithson, 'Tottering Towards a Treaty', *The Bulletin of the Atomic Scientists*, 48(6), July/August)
- At a meeting of the Japan Atomic Industrial Forum, the issue of what to do with the world's growing stocks of

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plutonium was discussed with particular reference to the impending availability of large amounts of fissile plutonium from dismantled nuclear warheads (also referred to under j. **Events in the Commonwealth of Independent States**, below). Experts doubt that there will be enough demand within the foreseeable future for all the plutonium arising from military and civil programmes; storage of surplus plutonium under international supervision (foreseen in Art. XII A 5. of the IAEA's Statute and long discussed in the Agency – ed.) is raised once again as one possible approach. The Agency's Director General has repeated his view that if fissionable material from dismantled weapons were transferred to the civilian sector, the IAEA could verify its storage or re-use in reactors. He has also said that the growing quantities of plutonium arising from civil uses and disarmament called for policies permitting its use in reactors. There has also been a suggestion to store fissionable material from dismantled warheads in the Arctic. (IAEA Press Release PR 92/17, 6 April; *Nucleonics Week*, April 9 and 16; *New York Times*, April 13; Admiral Stansfield Turner, *Freeze-Dry the Bomb*, OpEd article in *New York Times*, April 21)

b. NPT Events

- In **France**, on 29 April, the Senate adopted a law authorising the Government to accede to the NPT. On 19 June, the law was unanimously adopted by the National Assembly. With France's accession the Treaty will have 148 parties, including all five nuclear-weapon states. (Second Ordinary Session of 1991-1992 (Senate), pp. 942-948; *Agence France Presse*, 19 June)

c. Other Non-Proliferation Developments

- Meeting in Warsaw on 3 April, the adherents to the **Nuclear Suppliers Guidelines** agreed on common export controls for a list of dual-use items and undertook not to transfer nuclear facilities, equipment, components, material and technology to non-nuclear-weapon states unless they have a comprehensive ('full-scope') safeguards agreement with the IAEA. Exceptions are made for items deemed essential for the safe operation of existing facilities and the policy also will not apply to existing agreements and contracts. The statement adopted at the meeting, the guidelines for transfers of nuclear-related dual-use equipment, material and technology, and the list of relevant items are reproduced in section VI.1. The 27 states concerned are Australia, Austria, Belgium, Bulgaria, Canada, Czech and Slovak Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Russia, Spain, Sweden, Switzerland, UK and USA; these states must ensure that their pertinent legislation conforms with the common export regime. (*Nucleonics Week*, April 9; *NuclearFuel*, April 13; *IAEA Newsbriefs*, 7(2), April/May; *The New York Times*, May 3; *IAEA Document INFCIRC/405*, May)
- **Argentina** has adopted a 'Regime for Sensitive Exports', which affects the export of materials, equipment, technology, technical assistance and/or services related to the processing and enrichment of uranium, reprocessing of nuclear fuel, production of heavy water and manufacture of plutonium. Henceforth, the export of such items will require a license and will only be permitted under an agreement for nuclear cooperation that provides for IAEA safeguards. Argentina's president, in issuing the decree,

rejected his country's former ambiguous stance on nonproliferation and announced that nuclear agreements in effect before he assumed power will be reviewed to see if they violate the new regime. (*Nucleonics Week*, April 30; *IAEA Document INFCIRC/404*, May 1992; see section VI.2 of this Newsbrief)

d. Nuclear Disarmament

- At a Washington summit meeting, on 16 June, the Presidents of the **Russian Federation** and the **United States of America** reached agreement in principle on deep cuts in their respective strategic nuclear arsenals by the year 2003, going beyond those foreseen in the START Treaty. The agreement-in-principle is to be converted within ninety days into a legally binding treaty. It provides for a two-phase reduction process: first, the two sides will reduce their strategic forces to between 3,800 and 4,250 warheads with sublimits of 1,250 warheads on intercontinental ballistic missiles (ICBMs), including 650 on 'heavy' missiles, and 2,250 on submarine-launched ballistic missiles (SLBMs). In the second phase, ending in 2003, Russia's strategic warheads should be reduced to 3,200 warheads and those of the USA to 3,500. The agreement reflects concessions by both sides, with Russia giving up its multiple-warhead SS-18 and SS-24 land-based ICBMs, and the USA being obliged to halve the number of warheads on its SLBMs and to eliminate its 50 land-based ten-warhead MXs. Including the reductions agreed upon in START, the new accord should lead to a cutback of strategic warheads by 70% for Russia and 71% for the USA. Counting the tactical-warhead reductions earlier announced by President Bush and (then) President Gorbachov, total decreases in numbers of warheads held by the two countries will be 74% for Russia and 71% for the USA. (*The New York Times*, June 8, 9, 10, 11, 13 and 17; Tariq Rauf: *Deep Cuts in Strategic Nuclear Warheads – At Last!* in *Canadian Centre for Arms Control and Disarmament, Communiqué Number 83*, 17 June; *The Independent*, and *The Guardian*, June 18; *USIS European Wireless File News Alert*, June 18, item 9, *Joint Understanding on Strategic Offensive Arms - fact sheet*)
- Following months of intensive diplomatic effort, representatives of Belarus, Kazakhstan and Ukraine, the Russian Federation and the United States, meeting in Lisbon on 23 May in the framework of a 62-nation conference on assistance to the members of the CIS, signed a protocol to the **Strategic Arms Reduction Treaty (START)** that turns the Treaty into a five-party instrument, in which the three first mentioned republics undertake to give effect to that Treaty together with the initial signatories; to destroy or turn over to the Russian Federation all strategic nuclear warheads; and to accede as soon as possible to the NPT as non-nuclear-weapon states. Reportedly, the weapons deployed in Ukraine carry altogether 1,662 warheads; those in Kazakhstan 1,410, and those in Belarus 72. The move is meant to avert the risk that the dissolution of the USSR leads to the existence of additional nuclear-weapon states, and should permit early ratification of START. It seems, however, that the three republics – whose legislatures must ratify the agreement – still have reservations to turning over all nuclear weapons to Russia. Reportedly, Ukraine and Belarus want the dismantlement of warheads to take place under international supervision, and the former is also said to seek security guarantees. (*Financial Times*, May 20; *Frankfurter Allgemeine Zeitung*, 20 May and 21; *The*

New York Times, May 20 and 24; **International Herald Tribune**, May 20, 21 and 25)

- At their June summit meeting, **Russia** and the **USA** also agreed to initiate within one month high-level discussions on a joint anti-ballistic missile defence system. This is raising concern that the Anti-Ballistic Missile (ABM) Treaty of 1972 might be compromised. An analysis by the US Department of Defense reportedly concludes that the planned deployment in the United States of 100 land-based interceptors would violate the Treaty. There is concern in the US Congress at the announcement by the Defense Department that the system – which the Pentagon had earlier declared to be low-risk and ready for deployment by 1996 – will require more testing and that deployment must be put off until at least 1998 or 1999, because in its present form the plan is too risky and might conceal unknown defects. In the current year \$4.15-billion will be spent on the programme; for next year the Administration has asked for \$5.4-billion. Annual costs are expected to double once actual production starts. (**New York Times**, June 4 and 6; **Canadian Centre for Arms Control and Disarmament**, Communiqué No. 83, 17 June; **USIS European Wireless File News Alert**, June 18, item 6, Joint Statement on a Global Protection System)
- The **United Kingdom** will remove its tactical nuclear weapons from Royal Navy surface ships and attack aircraft. Except for the American nuclear depth-charges carried by anti-submarine Nimrod aircraft, which will be returned, the weapons are scheduled for destruction. To be retained are the strategic nuclear missiles on the Polaris submarines and on the four Trident boats that will replace them, and half the present number of WE177 free-fall bombs, for use by RAF Tornados. It is said to be possible, however, that the four Trident submarines will deploy fewer warheads than their maximum of 128 – viz. 8 for each of 16 missiles. (**The New York Times**, June 16; **The Economist**, June 20th; **The Bulletin of the Atomic Scientists**, 48(6), July/August)

e. Nuclear Testing

- On 21 May **China** detonated a nuclear explosive device with a yield of one megaton – its largest underground nuclear explosion so far. There is concern that this event may play into the hands of opponents to the French testing moratorium. Some American observers, on the other hand, consider it possible that the test – China's 37th – may portend a Chinese move toward accepting a comprehensive test-ban. (**The New York Times**, May 22 and 27; **International Herald Tribune**, May 22 and 23/24; **Defense News**, June 22-28)
- **France's** Prime Minister announced on 8 April that his country was suspending its nuclear tests in the Pacific for this year. He stated that France would retain its independent nuclear deterrent as the keystone to its defense policy but would press for a balanced reduction of nuclear weapons and deterrence of their spread. Reportedly, France has so far carried out 128 underground tests and had planned 6 more for the remainder of the year. Its decision has been welcomed by South Pacific states. France's President has called on the other nuclear powers to suspend their nuclear tests, but he has also said that if there is no progress in this regard, French tests would be resumed in 1993. (**Agence France Presse**, 8 April; **New York Times**, April 9; **The Times** [London], April 9; **The Guardian**, April 10; **The Independent**, 13 April; Tom A.

Zamora, 'Moruroa-torium' in **The Bulletin of the Atomic Scientists**, 48(5), June)

- Reportedly, the President of the **Russian Federation** has ordered preparations to resume at Novaya Zemlya for 4 underground tests, to be made once the present moratorium expires. He is said to have done so under pressure from the Russian military-industrial complex in which the consideration of continued employment for the nuclear physicists and technicians involved is said to be a factor. The commander of the armed forces of the Commonwealth of Independent States has said that unless by end 1992 the other nuclear-weapon states join a test ban, the CIS will resume testing. Reportedly, at their June summit presidents Bush and Yeltsin reached an understanding that Russia would carry out 4 to 6 tests a year for the next few years. According to a report in the Russian newspaper *Izvestia*, Soviet scientists in 1979 set off a nuclear explosion adjacent to a coal mine in Ukraine, supposedly to clear it of methane gas. The event might explain the reportedly high radiation level in the area, which had been attributed to industrial waste and to the accident at Chernobyl. (**BBC Summary of World Broadcasts**, SU/1371, 6 May; **ITAR-TASS**, 4 May; **The Christian Science Monitor**, May 11; **Trust and Verify/VERTIC**, No.28, May; Tom A. Zamora, 'Moruroa-torium' in **The Bulletin of the Atomic Scientists**, 48(5), June; **Süddeutsche Zeitung**, 22 June; **New York Times**, June 28)
- The **United States** House of Representatives has called for a one-year nuclear testing moratorium, if Russia also refrains from testing. There is growing support for this measure in the Senate, but there is some doubt that it can get a majority there. On 30 April the United States carried out its second underground test of the year (its 938th altogether); its yield was below 20kt. Altogether, six tests are planned for 1992. In response to the appeal by the President of France, the US Administration has stated that it must continue testing nuclear weapons as long as it relies on them for deterrence. Rejecting possible restrictions contained in an options paper said to have been commissioned from the Department of Defense, the White House has publicly stated that it had no immediate plans to place new limits on US weapon testing. Nevertheless, some observers expect that growing domestic and international pressure may compel the Administration to consider restrictions, such as a reduction in the number of tests. The primary reason given for continued testing is safety. However, in a recent white paper on the subject the Department of Defense also cites as reasons reliability and survivability. (**The Washington Post**, May 25; **New York Times**, May 27, June 5; **Trust and Verify/VERTIC**, No.28, May; **USIS European Wireless File News Alert**, June 12; Defense Department White Paper; John Isaacs, 'Congress Tests the Waters', **The Bulletin of the Atomic Scientists**, 48(6), July/August)

f. Nuclear Trade and International Cooperation

- It is expected that **Cuba** will continue to receive assistance from **Russia** in the completion of the nuclear power plant at Jaragua. Reportedly, Cuba will assume the hard-currency expenses, including the costs of the instrumentation it is planning to obtain from **Germany**. (**INTERFAX** [Moscow], 11 March, in **JPRS-TND-92-007**, 20 March)

- The news that **Czechoslovakia** is planning to export electricity to **Switzerland** has led to protests from environmental and anti-nuclear groups who charge that it will reinforce the likelihood that early-model VVER-44/230 reactors will remain in operation. **Germany** is selling Czechoslovakia fresh fuel from the idled Greifswald power station, at prices 30% below the original. (**Rude Pravo** [Prague], 15 April, in **JPRS-TND-92-013**, 29 April; **Nucleonics Week**, May 28)
- **India** will get no more fuel from **France** for its Tarapur Atomic Power Station once the present supply contract runs out, in 1993. The station was supplied by the **United States** under a cooperation agreement which expires in 1993. When the requirement for full-scope safeguards prevented further US fuel supplies to India, in 1982, France took over as supplier, but it is now bound by the same requirement. (**Nucleonics Week**, April 16)
- **Israel** is said to seek the cooperation of **Finland** in constructing a power plant near Shivta, south of Beersheba, of the type operating near Loviisa, Finland, which combines technology from the former USSR, Germany and Finland. (**Ha'aretz**, [Tel Aviv] 26 March and **Helsinki Radio**, 28 March, both in **JPRS-TND-92-010**, 8 April)
- 'LASCAR', a group of scientists from France, Germany, Japan, the United Kingdom, the United States, Euratom and the IAEA, operating on extra-budgetary funds provided by Japan, has reviewed the technologies the Agency will need to safeguard the large-scale fuel reprocessing plants expected to operate in the 1990s. LASCAR has concluded that there is a wide range of techniques available for effective safeguards at large reprocessing plants and the information and advice provided to the IAEA will permit it to select appropriate combinations of these techniques on a case-by-case basis, to design effective, efficient and credible safeguards systems for the new plants. (**IAEA Press Release**, PR 92/26, 22 May)
- The safeguards agreement with the People's Democratic Republic of **Algeria** in connection with the supply of a research reactor from the People's Republic of China has been concluded pursuant to IAEA document INFCIRC/66/Rev. 2, the safeguards system applied in cases where the State concerned is not a party to a comprehensive safeguards agreement. It was published as IAEA document INFCIRC/401.
- At its meeting in June the Board of Governors approved an agreement with Pakistan for the application of safeguards in relation to a power reactor to be supplied by China. (**IAEA Newsbriefs**, 7(3), June/July)

g. IAEA Developments

1. General

- For the first time in eight years, the Agency's Board of Governors has agreed upon a budget that departs from the zero-growth principle. The amount set aside for safeguards activities in 1993 has been raised by 4.6%, to \$62 million. This is to cover new safeguards tasks in Argentina, Brazil, North Korea and South Africa, but it apparently does not take account of the possibility that facilities in newly-independent parts of the former USSR would be submitted to safeguards. A reduction in IAEA safeguards activities in Euratom countries is factored in these budget estimates. Since there is no certainty that any of the states of the former Soviet Union will pay its assessment for 1993, and the likelihood that they will pay their contributions for 1991 and 1992 is small, the IAEA must continue to cut its across-the-board expenditures by 13%. (**Nucleonics Week**, June 25; editor's personal information)

2. Safeguards

- At its meeting in June, the Agency's Board of Governors once again considered ways of strengthening the safeguards system. It discussed proposals by the Secretariat on reporting of exports and imports for peaceful purposes of nuclear material and of certain items of equipment and non-nuclear material, which would give the IAEA important additional information to help it in the application of its verification measures. The Board will consider these proposals further, in the light of comments made. Meanwhile the Secretariat will invite states to provide it on a voluntary basis with the information in question. (**IAEA Newsbriefs**, 7(3), June/July)
- On 28 April, IAEA Director General Dr. Hans Blix, and Commissioner Cardoso e Cunha of the European Community endorsed a new partnership approach to the implementation of safeguards in the Community, by the IAEA and Euratom (see section VI.3). (**IAEA Newsbriefs**, 7(2), April/May; **IAEA Press Release** PR 92/23, 29 April).

h. Peaceful Nuclear Developments

- In 1991, there were 496 nuclear power plants operating or under construction around the world. One new plant each in Bulgaria, China, France and Japan came on stream, bringing the total number of operating reactors to 420; 76 power reactors were under construction, in 16 countries. Thirteen countries relied on nuclear energy for a quarter or more of their electric consumption. (**IAEA Press Release** PR 92/18, 6 April)
- The Joint Protocol of 1988 establishing a link between the Paris Convention on Third-Party Liability in the Field of Nuclear Energy, concluded in 1960 under the auspices of the OECD, and the 1963 Vienna Convention on Civil Liability for Nuclear Damage entered into force on 27 April. The Joint Protocol extends the benefits of each convention to the parties of the other. (**NEA Information and IAEA Press Release** PR 92/22, 27th April; **IAEA Newsbriefs**, 7(2), April/May)
- Following a meeting of a joint technical committee in March, the International Atomic Energy Agency and the Nuclear Energy Agency of the OECD are inviting their member states to adopt the International Nuclear Event Scale (INES) for use in classifying incidents and accidents at nuclear power plants. (**NEA Information**, 27th March; **IAEA Press Release**, PR/16, 27 March; **IAEA Newsbriefs**, 7(2), April/May)
- **Bulgaria** is hoping to get funds from industrial nations to help in upgrading the first four VVRR-440/230 reactors at Kosloduy. While Western experts believe that the expected results will not justify the expense, Bulgarian authorities, who see the station as essential to meet the country's power needs, maintain that the risks can be much reduced at reasonable cost. Units 1 and 2 are shut down for safety upgrading; units 3 and 4 are still operating. The more modern 1000-MW VVER unit 5 has been briefly closed for repairs to a faulty steam generator

control; unit 6, which is still in its start-up testing phase, was closed recently for major maintenance and repair work, and also to save fuel for next winter. Unit 5 will also be shut down for three months during the summer for the same purpose. (*Nucleonics Week*, April 16, May 16, 28) – see also below: *Lithuania, et al.*

- The IAEA's Deputy Director General for Administration has said that Japan's plans to store large quantities of plutonium for peaceful nuclear use could pose political and security problems. The head of Japan's Power Reactor & Nuclear Fuel Development Corp. is quoted as saying that the country should de-emphasise the breeding side of fast reactor technology and concentrate instead on burning plutonium. The secrecy surrounding the planned sea shipments of reprocessed Japanese plutonium from Europe is criticized in a report issued under the aegis of Greenpeace International and the Nuclear Control Institute of Washington, in which, among other points, questions are raised about the ability of the transport containers to withstand fire and collision. A report of 1988 by the Pentagon also pointed to the risks. In early April, Japan's Prime Minister approved the 1992 nuclear development and utilization basic programme, which confirms the sea shipment. The 6,500 ton armed escort vessel *Shikishima*, built to escort the plutonium-carrying freighters, is now operational; it will be part of Japan's coast guard, the Maritime Safety Agency. (*Nucleonics Week*, April 9, 16 and 30; *Nuclear Fuel*, May 25; *The New York Times*, April 13; *Atoms in Japan*, 36(4), April)
- **Lithuania** is having problems with its Ignalina-2 RBMK-1000 reactor, where 578 welding defects have been found in fuel channels. Although backfitted and downrated it is not considered safe, but it cannot be shut down because its contribution to the country's power grid is indispensable. There will soon also be a lack of storage space for irradiated fuel, a problem Lithuania shares with other countries operating Soviet-designed reactors, notably **Bulgaria, Czechoslovakia and Ukraine**, whose spent fuel Russia seems no longer willing to take back. In the **Russian Federation** the incident which occurred at the Leningradskaya-3 reactor – a second-generation RBMK unit, which supposedly has better safety features than first-generation units such as the one at Chernobyl which exploded – is now thought to have been due to overheating of a fuel channel, followed by the inadvertent closing of an isolation control valve, which cut the flow of coolant to the channel. A definitive report is expected in October. Among possible causes cited are human error, material fatigue and faulty manufacturing. There is some question about the level of risk caused by the event; both Russian and Western experts now see it as having been at Level-2 on the International Nuclear Event Scale (INES). The incident has added to the world-wide concern about the safety of RBMK reactors; the IAEA has embarked on a major study of that issue. At an initial expert meeting in Vienna on 6-10 April, specialists from 11 western countries – including a consortium of Canada, Finland, France, Germany, Italy, Sweden and the United Kingdom already engaged in the effort – and two states operating this type of reactors – Lithuania and the Russian Federation – endorsed the idea of a coordinated and comprehensive international effort for the short-term improvement of RBMK safety; allegedly, however, Russian nuclear authorities prefer that the IAEA not take a leading role in this effort, ostensibly because it does not

have enough expertise in this area, but mainly, it is said, because of negative views earlier expressed by the Agency about the safety of VVER-type stations. Some western experts, especially in Germany, are of the view that all RBMK-reactors should be shut down, a view reportedly shared by Jacques Attali, President of the European Bank for Reconstruction and Development, which will have a major role in financing the decommissioning and upgrading of Soviet-designed nuclear power plants in Eastern Europe. Western private commercial banks are reportedly not prepared to fund construction of new nuclear plants in East Europe unless international institutions and states lead the way.

There are 15 RBMK-type reactors in existence (11 in Russia; 3 in Ukraine and 1 in Lithuania). There are also 12 first-generation VVER-440/230s (4 in Russia; 4 in Bulgaria; 2 in Czechoslovakia and 2 in Armenia – shut-down but about to be reactivated); 14 VVER-440/213 (4 in Russia, 4 in Hungary and 6 in Czechoslovakia, which is building 4 more); and 18 VVER-1000s (7 in Russia, 9 in Ukraine and 2 in Bulgaria). In Russia and Czechoslovakia a total of 17 VVER-1000s are under construction, but an American consulting firm, working for the Czech Republic, is reported to have advised against completing two units at Temelin, claiming that they are not needed and their completion would take more time and cost much more than estimated. The oldest VVER power reactor, the VVER-440/230, is considered to have serious safety flaws which it would be uneconomical to try to remedy in the long run. Later versions of the VVER – the VVER-440/213 – are thought safer but still in need of considerable upgrading. The two units of this type that operate in Finland have been backfitted, but the fourteen in Czechoslovakia, Hungary and Russia have not. Two more are being built in Cuba. The newest type, the VVER-1000, is generally thought to have relatively good safety features. There is a report that an advanced version of this type of reactor is considered the best choice to replace two of the first-generation VVER-440 reactors at the Kola Peninsula in Russia. Recently, however, Lord Marshall, the chairman of the World Association of Nuclear Operators, is reported to have told the British Nuclear Forum that, due to an elementary design fault, all the steam generators of this type of reactor tended to crack, so that primary coolant leaks into the secondary system. Other sources say that their operating controls need updating. A plan has been drawn up for assistance by the seven major industrial states to improve the safety of Soviet-designed reactors by upgrading those where this is thought to be feasible and decommissioning others; it is expected to be endorsed at a meeting of the G-7, in July. The plan, prepared by a specialised working group, foresees short-term operation safety support for all existing reactors and immediate improvements to VVER-440/230 units, for a total of \$720-million over 5 years, and longer-term upgrading of VVER-440/213s and VVER-1000s, for a total of \$5.7-billion. The estimates, which differ markedly from those published earlier, which ranged between \$10-billion and \$20-billion, do not include the cost of assistance in the improvement of reactors under construction. The plan apparently assumes that by the end of the first five-year period all VVER-440/230 units and all RBMKs will be shut down and it does not appear to include assistance for their decommissioning. Prime Minister Mulroney of Canada has announced a 'nuclear safety initiative' under which his country will make available \$30 million to

promote greater safety of nuclear stations in Eastern Europe. Earlier, Russia's deputy minister for atomic energy, Viktor Sidorenko, said that backfitting of RBMKs would go on and that if, given Western doubt that upgrading these plants would ensure their safety in the long term, insufficient funding should be expected from that quarter, it would have to be done with domestic funds. Plans for the replacement of the control valves of all RBMK-1000 units, and for checks of the valves at the newer RBMK-1500 reactors are said to be in place.

Reportedly, the Russian nuclear authorities are considering replacing all 1,700 pressure tubes in all existing RBMKs. Sidorenko is further quoted as saying that the initial pairs of RBMK-1000 reactors at Leningrad and Kursk were likely to be the first to be decommissioned for safety reasons. The date of decommissioning would depend on the pace of the RBMK modernization programme; no decision to shut down RBMKs would be taken unless the supply of replacement power was assured. The nuclear safety institute of the Russian academy of sciences is quoted as saying that although the first generation of RBMKs should be shut down as soon as possible, others might have to go on for another thirty years. The last two operating RBMKs at Chernobyl, Units 1 and 3, which are first-generation RBMK reactors, have been shut down for repairs to fuel channel control valves, but they are expected to remain closed. (*Nucleonics Week*, April 2, 9, 16, 23 and 30, May 7, 14, 21 and 28, June 11, 18 and 25; *NuclearFuel*, May 11; *IAEA Press Releases*, PR 92/14, 24 March, 92/16, 27 March, and 92/19, 10 April; *IAEA Newsbriefs*, 7(2), April/May; *The Washington Post National Weekly Edition*, April 6-12, *NEA Information*, 27th March; *New York Times*, May 21)

- In Pakistan, work has started on construction of a 300-MW pressurised water reactor (PWR) at Chashma, to be supplied by China. It is meant to be ready in 85 months. The capacity of the US-supplied PARR-1 (PINSTECH) reactor at Rawalpindi has been raised from 5 to 10 MW(th). Its highly-enriched core has been replaced by low-enriched uranium fuel, also supplied by China (*ENS NucNet News*, No. 208-9, 25 May)
- In the **United States**, decreased energy demand and lower electricity prices, due in part to natural gas having become cheaper, may lead to the closing down of up to ten older nuclear power plants during the present decade. This will be an expensive exercise. It is estimated that dismantling and decommissioning the Yankee Rowe plant, which cost \$39 million to build 32 years ago, will cost \$247 million. Decommissioning of the Shoreham nuclear plant in Long Island, New York, which cost more than \$5 billion to construct and which never went on line, has begun. Tennessee Valley Authority (TVA) is reportedly contemplating postponing completion of several nuclear power stations now under construction, if it can get some of its hydro and fossil units to operate more efficiently. While TVA's newly appointed Chairman, John Waters, has said he is absolutely committed to nuclear power, it has been noted that he did not say whether he would add new nuclear power to the system when there is a need. The Hudson Institute has expressed the view that natural gas and new coal technologies will meet American energy needs for the next 20 or 30 years after which the country must 'face up to' using nuclear energy. A scientific panel of the National Research Council has concluded that if

nuclear power is to remain a viable energy option, costs must be reduced, regulations must be simplified and a solution must be found for the problem of radioactive waste disposal. The panel recommends development of an advanced-design mid-sized nuclear reactor. The Westinghouse electric corporation has presented the Nuclear Regulatory Commission with an analysis of a 600-MW(e), simplified and standardised reactor, which is said to be many times safer than current regulations require, which could be constructed faster than present reactors, and would cost much less. Reportedly, General Electric Company is also preparing a design of a reactor of about the same size. (*The New York Times*, April 14, June 2, 13, 18 and 28; *Nucleonics Week*, April 16 and 23, June 4 and July 2)

i. Events in Nuclear Weapons States

- **France's** Minister of Defence Joxe has ordered a study of the country's future needs for plutonium and enriched uranium for defence and has ordered the alert level of French nuclear forces to be lowered. This is said to imply, among other measures, the reduction of ballistic missile submarines at sea from three to two. Production of the ground-launched, mobile, short-range Hades missile has been cancelled. Originally, 120 of these weapons were to have been built. Last year, that order was reduced to 30, and it was decided that they should not be deployed but stockpiled. Earlier, construction of the S-45 missile, which was to have succeeded the Hades, was also cancelled. It appears that the question is being studied whether the Pierrelatte enrichment plant should be closed. The Socialist former Minister of Defence, Chevenement, has stated that France could not eliminate its nuclear arsenal, in view of the need to defend itself against nuclear attack from new nuclear nations in the developing world

France recently produced 10 grams of PWR-grade enriched uranium in just over two hours by means of atomic vapour laser isotopic separation. The process will be tested further for eventual commercialisation

The UP3 reprocessing plant at Cap La Hague was formally inaugurated on 14 April. By 1994 it should reach its full capacity of 800-850 MT/yr. (*Agence France Presse*, 8 April; *New York Times*, April 9; *NuclearFuel*, April 13 and May 11; *Nucleonics Week*, April 20; *Defense News*, June 8-14; *The Guardian* and the *International Herald Tribune*, June 13; *Die Welt*, 15 June)

- The **United States** Department of Energy has announced that it will no longer produce highly-enriched uranium for weapons purposes.

After the resumption of pre-critical testing of the K-reactor at Savannah River – which will be used mainly for tritium production – a leak in the cooling system brought another delay. Criticality was reached on 8 June, and the reactor is now operating at zero power, where it is to stay for two to three months, after which it should go to its newly imposed ceiling of 30%. When the power ascension programme is completed the reactor will be shut down again, to be connected to a new cooling tower. There is question about the need to operate the reactor at all, and its future programme is not certain.

An audit by the US Office of Management and Budget has found estimates by the Department of Energy for the cost

of clean-up at nuclear-weapon production sites to be greatly inflated. This is said to be due in part to too much reliance on private contractors, who make liberal allowance for possible liability suits and tend to overestimate the cost of the work, and partly also to unrealistically high estimates of administrative costs. Congressional investigators and the Environmental Protection Agency are reported to have reached similar conclusions.

The US Navy and the Congress are trying to prevent the curtailment of the Seawolf submarine programme by two boats, as proposed by the President. The House of Representatives has voted to restore the appropriation for one of the two boats and the Senate has voted to continue funding both. Those favouring continuation of the programme say that if building is discontinued 'the art of building nuclear submarines' will have been lost by the time production of the new class of smaller attack submarines ('Centurion') is to start; that the continuity of the skilled workforce must be assured; and that much of the money involved has already been spent anyway. Opponents argue that there are now twelve submarines under construction (six Tridents, five Los Angeles attack subs and one Seawolf); that by the time those are finished the current workforce of 19,000 will have been reduced to 7,000; that the construction of two boats is of no more use than one in retaining experience; that the smaller submarines may not be needed until well into the next century if at all; that the expertise needed could be re-acquired by that time and that in any case the addition of two Seawolfs that would be completed long before then would not provide the bridge of experience or the continuity of the workforce sought; and that the needed skills are also found among personnel building other kinds of nuclear vessels and maintaining existing ones.

In light of new information about sea-dumping of radioactive materials by the former USSR, (See below, section I.j.) US sources contend that while the USA initially followed the same practice, this involved mainly low-level radioactive waste. Apparently, during the early years, some containers were dumped in shallow waters near Boston and San Francisco; subsequently, wastes were disposed of in depths of 6,000 feet or more. The practice ended altogether in 1970. The US Navy stores the reactor sections of its decommissioned nuclear ships, and the associated radioactive wastes at the Hanford and Savannah River sites.

The White House has approved the purchase of the Russian Topaz II 6-kilowatt space reactor for experimental use, to help in the development of a larger American space reactor which has not so far been successful. The US Department of Energy has also been authorised to buy from the CIS plutonium-238, as a power source on deep-space missions. (*Arms Control Today*, 22(3), April; *Nucleonics Week*, April 2, May 28 and June 11; *New York Times*, April 2 and 30, May 1, 8 and 27)

j. Events in the Commonwealth of Independent States

- During a visit to Washington, President Kravchuk of Ukraine assured President Bush that his country would accede to the NPT as a non-nuclear-weapon state; this assurance was subsequently formalised when Belarus, Ukraine and Kazakhstan signed a protocol to START which contained an undertaking to this effect. (See

section I.d above) While President Kravchuk reportedly confirmed that Ukraine would get rid of the 134 strategic missiles deployed there and that the 46 remaining tactical nuclear weapons would be shipped to Russia for demolition, before 1 July, Russian sources maintain that all short-range nuclear weapons have already left Ukrainian territory. Kazakhstan has said that the strategic nuclear weapons deployed there must remain until they can be dismantled under international supervision. Other reports speak of Kazakh insistence on retaining these weapons indefinitely.

Two of the three 1000-MW(th) plutonium-producing reactors at Krasnoyarsk, Siberia, will be decommissioned, probably this year. The third unit operating there is also used to produce electricity and heat and there do not seem to be plans to shut it down soon. All production reactors at Chelyabinsk-40 in the southern Ural have been shut down and it has been announced that the third weapons material complex, at Tomsk, in Siberia, will be closed. Russian sources report that the country already has a military stockpile of 100 tonnes of separated plutonium.

Germany is supporting a proposal to transfer mixed-oxide ('MOX') fuel fabrication technology to Russia and is trying to get other Western governments to participate; France is said to be in favour of the idea. There have already been technical talks between the Russian nuclear ministry, Minatom, and the fuel-fabrication subsidiary of Siemens. Russia hopes to obtain equipment and technical help to complete a 60 MT/yr MOX fabrication plant at Chelyabinsk and eventually also a 300-400 MT/yr plant at Krasnoyarsk, to recycle plutonium arising from the dismantling of nuclear warheads. It is said not to have the breeder- capacity in which to burn straight plutonium, but it would use it in MOX-fuel, mainly in light-water reactors, including the existing VVER-plants, and is also reportedly hoping eventually to export MOX-fuel. German industrial sources are quoted as estimating that the present inventory of weapon-grade plutonium from dismantled warheads could be burned in 15 years in the VVERs and the BN-600 fast breeder reactor at Beloyarsk. At the April meeting of the Japan Atomic Industrial Forum, German officials said that in the near term large amounts of separated plutonium would still have to be stored.

According to an estimate recently made at the Massachusetts Institute of Technology, dismantling of nuclear warheads in Russia is likely to yield between 15 and 20 tonnes of high-enriched uranium a year. The end use of the material has yet to be decided. Reportedly, two weapons dismantling sites now operating in the Urals can handle 1,500 to 2,000 warheads annually.

At a meeting on safeguards held in Stockholm recently, a Russian expert said that the dismantling of nuclear weapons created problems too difficult to be solved in the two years set for it by President Yeltsin. The head of the Safeguards and Security Division of Sweden's nuclear power inspectorate expressed the view that for now the nuclear material would be safer left where it was, under military control. Sweden will assist Lithuania, Russian and Ukraine in setting up national safeguards systems.

United States assistance in the dismantling of nuclear weapons in the former USSR, (which will be funded from the \$400-million set aside for that purpose, for the

elimination of chemical weapons and for the establishment of science and technology centres in Russia and the Ukraine) will be concentrated on Belarus, Russia and Ukraine; apparently, Kazakhstan is not at present involved in this operation, either because, as Kazakh sources claim, it has turned down an offer of help, or because, as reported in the American press, the US Administration wishes assistance to be withheld until Kazakhstan's position with regard to the nuclear weapon on its territory has become more clear. The programme, which will be carried out in large measure by American contractors, will include construction of a storage facility for nuclear material and weapon components; the supply of storage and transportation containers for fissile material; help with nuclear materials accounting and control; and provision of accident response equipment and training. Japan also plans to provide expertise on disposal of warhead materials, which it considers could best be burnt as power reactor fuel.

There is growing evidence of a long-standing practice on the part of the former USSR to dump nuclear waste from naval vessels and ice-breakers into Arctic waters, particularly the Barents and Kara Seas. Large numbers of containers with solid radioactive waste and nuclear reactors from decommissioned submarines and ice-breakers are known to have been dumped, together with the highly radioactive nuclear fuel in them. Apparently, at times when containers would not readily sink, they were holed to allow water to enter. Radioactive waste water from reactors was diluted with sea water and discharged. In the early years, allegedly, Soviet authorities hoped that the high radiation level of the sea water might be screened by fallout from atmospheric nuclear tests. Britain hopes to send a research vessel to the Kara Sea to monitor radioactivity levels and Norway and Russia are planning jointly to investigate where radioactive waste has been dumped and what risks it poses. Another source of concern is the Russian naval establishment at Paldiski, in Estonia, with its two 25-MW land-based submarine training reactors. Both Sweden and Estonia have doubts about the safety of the reactors, which are not operating at present, and about the accumulated nuclear waste, and are asking that the site should be closed and cleaned up. There has been much international and Russian criticism lately of the nuclear reactors on board CIS submarines, which are said to have serious safety defects, reportedly due largely to the wish to make them as small as possible. Safety considerations appear to be a factor in the Russian decision to reduce the submarine fleet drastically. Near the port of Murmansk there are said to be dozens of old nuclear submarines awaiting decommissioning. Russian ship-builders are understood to seek western assistance in the decommissioning of 50 nuclear submarines during this decade. The United States has undertaken to help Russia in disposing of its obsolete nuclear submarines in the Far East. The nuclear parts of these boats will apparently be buried on land. It was disclosed recently that in 1974 a Soviet ship carrying nuclear depth charges had sunk in the Black Sea near the Crimean coast; reports of radiation leaking from the wreck are causing worry in Ukraine.

Notwithstanding the US Administration's declared policy of assisting the CIS, the US Commerce Department has continued its investigation into allegations of dumping of uranium by Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine and Uzbekistan. On 29 May it made a preliminary ruling that these

countries were selling uranium at unfairly low prices. If the ruling becomes final, as expected, it will involve the imposition of a punitive import tariff that will more than double the price. The US Court of International Trade had previously denied a Russian request to order the action stopped; separate legal actions were also brought by Ukraine and Tajikistan. European producers are not expected to follow the American example, but to ask CIS countries for voluntary guarantees to keep their uranium exports 'limited and responsible'.

After the reorganisation of the Russian nuclear establishment questions are raised about the future orientation of that country's nuclear policies. There is concern among Western governments at the appointment as head of the new Ministry of Atomic Energy (Minatom) of Viktor Mikhailov, a former MAPI official said to be dedicated to the survival of the nuclear-military complex, who is reportedly seeking an end of the ban on testing in the Arctic, has supported the idea of exporting peaceful nuclear explosions through the private firm 'Chetek', and is said to be against a shut-down of the RBMK reactors, apparently because they are useful sources of weapon-grade plutonium. The fact that President Yeltsin has given orders for the preparation of a second underground testing site at Novaya Zemlya is thought to be connected with Mr. Mikhailov's appointment.

The number of press reports, appearing particularly in the West, about nuclear material being offered for sale by persons from the former USSR is increasing. The alleged offer of several tonnes of heavy water to a Norwegian firm is under investigation by Russian authorities. A number of other reports cannot be substantiated. Some Russian observers attribute these reports, as well as the allegations of a large scale exodus of former USSR nuclear scientists, to an economically motivated campaign to discredit members of the CIS. (*Izvestiya*, 11 March and *Tass International Service*, 12 March, *O Globo* [Rio de Janeiro], 10 March and *Moscow Radio Rossii Network*, 11 March, all in *JPRS-TND-92-007*, 20 March; *Izvestiya*, 16 March in *JPRS-TND-92-008*, 26 March; *Aftenposten* [Oslo], 11 March, in *JPRS-TND-92-009*, 3 April; *Komsomolskaya Pravda*, 1 April, *Rossiyskaya Gazeta*, 24 March and 1 April, and *Interfax* [Moscow], 30 March, all in *JPRS-TND-92-010*, 8 April; *Nucleonics Week*, April 9, 16 and 23, May 7, 14, 28, and June 18; *NuclearFuel*, April 13, May 11 and 25 and June 8; *The New York Times*, April 29, May 4, 7, 9, 27, 30 and 31; *The Guardian*, 15 May; *Defense News*, May 25-31; *BBC Summary of World Broadcasts*, SU/W0225, 10 April; *Moscow TV Channel 1*, and SU/1375, 8 May; *ITAR-TASS*, 6 May; *The Times* [London], 3 June; *The Financial Times*, 4 June; *Moscow Interfax*, 28 April, and *ITAR-TASS*, 30 April in *JPRS-TND-92-014*, 14 May)

k. Developments of Concern for Horizontal Proliferation

- **Bulgaria/Iran:** Sofia has denied that nuclear warheads from the former USSR were transhipped through the port of Varna. According to reports in British and German media, this supposedly involved four 152-mm nuclear artillery shells from Kazakhstan, destined for Iran. The commander of the joint CIS armed forces, Lt. Gen. Zelentsov, has denied that nuclear warheads could have been taken out of Commonwealth custody. Kazakh authorities have also denied that there had been any unauthorized removal of warheads from their territory. In

another report the German magazine Stern alleges that in 1991 Iran obtained two medium-range nuclear missiles from stocks in Kazakhstan. This has been denied by Iran, by the Russian foreign intelligence service and by the head of the Kazakh KGB. Allegedly, however, some of this information has come from Russian intelligence sources; these are also quoted as saying that another warhead from the nuclear base at Semipalatinsk is missing and believed to be somewhere in the Middle East. (**Defense News**, 24 February; **Sofia Radio**, 17 March, **Moscow Radio World Service**, 17 March, **Nezavisimaya Gazeta** [Moscow], 18 March, and **Xinhua**, [Beijing], 18 March, in **JPRS-TND-92-008**, 26 March; **Moscow Radio Rossii Network**, 16 March, **Izvestia**, 17 March, and **ITAR-Tass**, 16 and 19 March, in **JPRS-TND-92-009**, 3 April; **Trust and Verify/VERTIC**, No. 27, April; **Moscow Television**, 2 May and **ITAR-TASS**, 4 May in **JPRS-TND-92-014**, 14 May; **BBC Summary of World Broadcasts**, SU/1371, 4 May; Russian TV 30 April and 2 May; **The New York Times**, June 7)

- Speculation and concern about the nuclear intentions of the **Democratic People's Republic of Korea** intensified during the first part of the period covered by this **Newsbrief**. New reports about the impending completion of a large reprocessing plant to extract plutonium from irradiated reactor fuel were consistently denied by North Korea; Pyongyang appeared to persist in its resistance to inspection of its nuclear facilities; the head of the US Central Intelligence Agency publicly stated that North Korea was close to having a nuclear weapon capability; Russian sources cited a KGB report that already in 1990 North Korea had made a nuclear explosive device; and in early April Russian Television alleged that 56 kg of plutonium, supposedly from dismantled warheads, had been smuggled to North Korea. On 9 April, the North Korean Parliament ratified the comprehensive safeguards agreement with the IAEA; media reports that it had attached the condition that inspections of nuclear facilities should take place only once the country was no longer threatened with nuclear attack by any other state were not borne out. On 4 May North Korea provided the IAEA with the 'initial inventory' of its nuclear facilities. This lists several installations of which the existence had not previously been revealed. It includes one 5-MW experimental power reactor in operation, a 50-MW(th) and a 200-MW(th) reactor under construction (all gas-cooled, graphite-moderated, natural-uranium models suitable for the production of high-quality plutonium), a subcritical assembly, a fuel fabrication plant, a storage facility, two uranium mines and ore processing facilities. The issue of the supposed reprocessing plant may have been settled in part by the disclosure at the suspected site of a plant listed as a radiochemical laboratory for research on the separation of uranium and plutonium and waste management and for the training of technicians; according to North Korean sources, so far only minor quantities of plutonium have been extracted there, from damaged fuel bundles. On 11-16 May, IAEA Director General Hans Blix paid an official visit to North Korea. He was shown the plant in question, and is quoted as saying that it was 80% complete and once finished would indeed conform to the definition of a reprocessing plant. Western press reports speculate that reprocessing equipment may have been removed from the facility, but Dr. Blix is also quoted in the media as having said that he saw no evidence of equipment having been removed. If indeed a large part of the necessary equipment has not yet been installed, this is

thought to indicate that North Korea's efforts are not as far along as had been suspected. North Korean officials reportedly told Dr. Blix' team that they hoped to produce plutonium for eventual use in a breeder reactor or in mixed-oxide fuel, and high-level North Korean officials are cited as having told the IAEA that they would be ready to consider giving up part of their nuclear programme if they were given foreign nuclear assistance.

While little direct evidence seems to have emerged so far that North Korea was engaged in a nuclear-weapon programme, some observers think that Pyongyang may have had a substantial plutonium-production programme which it has abandoned, either as a result of international political pressure or for technical reasons; some observers think that it already has extracted a substantial amount of plutonium, which has been set aside for a secret weapon programme. In any case, it appears that North Korea has long been engaged in research on plutonium extraction. According to recent press reports, already in the early 1960s the USSR provided North Korea with hot cells and information on plutonium extraction, which it is said to have used to reprocess unsafeguarded material clandestinely irradiated in the safeguarded IRT research reactor. Some Western analysts suspect that this initial research was followed by the construction of a pilot reprocessing plant, which North Korea now seeks to keep secret and has omitted from the inventory given to the IAEA. This has been denied by North Korea's roving ambassador for nuclear affairs, O Chang Rim, but a suggestion to that effect is reportedly contained in a confidential report by the IAEA's Director General. The IAEA has confirmed previous North Korean statements, that Agency inspectors have been invited to visit any site and installation they wish to see, irrespective of whether it is found on the initial inventory list. During his visit, Dr. Blix was also shown several large, well-ventilated underground passages and shelters, said to be meant to house equipment, people and documents. Reportedly, the two large reactors under construction have electric power distribution grids, suggesting that they are intended for power generation. During another series of bilateral talks in Beijing about the normalisation of relations between the Democratic People's Republic of Korea and Japan, on 13-15 May, Japan is said to have demanded that North Korea eliminate all doubts about its nuclear intentions, while the latter accused Japan of accumulating more plutonium than necessary, thus acquiring the capability of becoming a nuclear-weapon power if it wanted to. (**Congressional Testimony**, March 27; **Argumenty I Fakty** [Moscow], No. 10, 14 March, in **JPRS-TND-92-009**, 3 April; **Moscow/Ostankino TV**, 10 April, in **JPRS-TND-92-012**, 22 April; **IAEA Press Releases** PR 92/20, 10 April, PR 92/24, 5 May and PR 92/25, 15 May; **New York Times**, April 10 and 16, May 4, 7 and 17, June 4 [article by G. Milhollin], 15 and 16; **Nucleonics Week**, April 23, May 7 and 21; **NuclearFuel**, May 11 and 25, June 22; **The Washington Post National Weekly Edition**, April 27-May 3; **International Herald Tribune**, May 18; **The Washington Post**, June 16 and 20. The safeguards agreement was published in May as **IAEA Document INFCIRC/403**)

- On 29 May – a week after China's megaton-size nuclear test – **India** tested an indigenously built 'Agni' missile over a range of more than 1,500 miles. Shortly before, the US had imposed a ban on the sale of rocket technology to India, following that country's refusal to cancel its

agreement with a Russian company for the production of a new-type rocket engine. This is said to have led to a scaling-down of the first joint Indian/American naval exercises in the Arabian Sea, to two ships from each country. Nevertheless, relations between the two countries are evidently much improved. While India still does not appear open to American efforts to convince it of the value of a regional non-nuclear solution, especially following Pakistan's confirmation that it had developed the means to make a nuclear weapon, and given its concern about China, discussions with the USA about measures to diffuse the nuclear confrontation in the area continue. (*Nucleonics Week*, April 2 and June 25; *The New York Times*, May 31; *The Economist*, June 6th)

- In Iraq, under UN Security Council resolution 687, the IAEA has demolished the facilities at Al Atheer which it judged to have been designed for use in that country's nuclear-weapon programme. Notwithstanding Iraq's insistence that the Al Atheer centre was devoted to civil purposes, Agency experts remain convinced that it was mainly intended to house several stages in the process of developing and fabricating nuclear weapons, including specialised uranium metallurgy and the testing of explosive charges; several Iraqi documents have been found substantiating this. The first and largest of eight buildings which the Agency had earmarked for demolition, from among a total of about 100 buildings at the site, was blown up on 13 April. A building at the adjacent Al Hatteen site, which was reportedly used for high-explosive test firing, and was too solidly constructed to be effectively dynamited, is said to have been put out of use by filling it with concrete and scrap. Subsequently, demolitions were carried out at the calutron facilities at Tarmiya and Ash Sharkat. At Al Atheer a number of items of equipment relating to Iraq's nuclear-weapon programme has also been destroyed. Iraqi personnel are said to have given all necessary cooperation in the destruction process. The irradiated fuel from the Soviet-built IRT-5000 research reactor, that had been moved during the war in the Persian Gulf and stored under conditions that raised serious corrosion risks, has been shifted under IAEA supervision to a specially constructed holding pool. The fuel is earmarked for removal and reprocessing by an Anglo-French consortium, once necessary funds have been obtained. Nuclear-weapon experts from France, Russia, the United Kingdom and the United States, who met in Vienna in April to review evidence compiled by inspectors from the IAEA, are said to have concluded that at the outbreak of the war in the Persian Gulf Iraq's nuclear-weapon programme was still facing significant problems and that it would probably have taken Iraq at least three years to produce the first atomic weapon. Notes by an Iraqi specialist reportedly give reason to conclude that at the outbreak of the war the electromagnetic enrichment ('Calutron') programme may have been three years away from producing enough enriched uranium for one bomb. The programme is now thought to have been a year or more behind schedule, and to have had less than half the production-rate it was believed to have, except that Iraq might have reduced the lead time by using low-enriched uranium as feed material. In that connection, it is noted that Iraq had a stock of more than 1,700 kilograms of 2.6% enriched uranium supplied by Italy in the early 1980s, which was subject to IAEA safeguards. Also, in 1980 and 1980 Portugal reportedly sold Iraq 213 tonnes of uranium [presumably as ore concentrate - ed.]. As to the design of the actual weapon,

expert opinion now seems to be that this would not have been ready until 1994. The design of the gas centrifuges, which were to be used in a parallel enrichment scheme, is now thought to have serious flaws and recent reports say that this programme would not have produced significant quantities of weapon-grade uranium until the second half of the 1990s. In evidence of the priority Iraq seems to have given to its nuclear effort, inspectors are said to have noted that the equipment found at various sites was largely of very high quality and in many cases state-of-the-art.

So far, the IAEA has pressed Iraq in vain for the names of foreign firms that have supplied the material and equipment for its nuclear-weapon effort and of the outside experts who have assisted it; some may have come from Germany, but there are also indications that Pakistani experts were involved. Iraq is said to have submitted what is supposed to be a full report explaining its entire nuclear programme, but this apparently does not to give all the information the IAEA and the Security Council need to complete their analyses of that programme. There are thought to be unexplained inconsistencies in the information supplied, among other things on quantities of material - Iraq may have received 400 tonnes of maraging steel, but its officials have so far only confirmed receipt of 100 tonnes - and components for the manufacture of centrifuges. Without full information on the sources of supply, there remains a possibility that Iraq can again try to produce weapon-grade material. In particular, unless the IAEA can rule out that Iraq had more than the twenty carbon-fibre centrifuge rotors it reported, the theoretical possibility that it will resume enriching uranium with undeclared rotors of that type is recognised; the existence of a hidden enrichment cascade also does not yet seem to be quite ruled out. There appears to be no further evidence of a concealed plutonium-production reactor, about which there had been speculation in the past. However, IAEA deputy director general Zifferero is quoted as saying that, while for the time being the Agency has deterred Iraq from being a nuclear threat, it still has the people, the knowhow and the funds that would enable it to resume its efforts. The Director of Central Intelligence of the USA has stated in a congressional hearing that, although a large quantity of Iraqi nuclear-related equipment had been identified and destroyed, he suspected Iraq had managed to hide some equipment. In Switzerland, criminal proceedings against two firms accused in 1990 of the attempted export to Iraq of material, tools and other equipment for the manufacture of gas centrifuges have been dropped as a result of legislative loopholes that prevented a successful prosecution. A member of the US Congress has found evidence that in early 1989 officials of the Department of Energy drew attention to Iraq's wide-ranging purchases of parts for gas centrifuges and triggers for nuclear weapons, but that the information was dismissed as alarmist. The employees involved have reportedly been disciplined. Much media attention is given to the disclosure that in the same year a senior State Department official warned that some of the substantial loan guarantees given to Iraq by the USA were being used to procure nuclear-related equipment, including a 'nuclear fuel compounder' (sic). According to testimony given at a Congressional hearing the memorandum containing this warning did reach the Secretary of State, but was ignored. Subsequently, the Administration is reported to have authorised an additional \$1-billion in loan guarantees to Iraq, in line with a White House policy directive of 1989, ordering aid to be

given to Iraqi President Saddam Hussein as a way of moderating his behaviour and increasing American influence in Iraq. The US Congress is discussing charges that government agencies at first withheld documents about sales made to Iraq before the war in the Persian Gulf, which it had asked for, and when this turned out not to be tenable, altered some of them. Congress is also investigating allegations that an official of the Atlanta branch of the Banco Nazionale del Lavoro, which supposedly loaned Iraq \$5-billion with US Government backing, is being prevented by the Justice Department from making a full disclosure. (*Congressional Testimony*, March 27; *Le Monde*, 11 April; *Nucleonics Week*, April 23, May 7 and 28, June 11 and July 2; *NuclearFuel*, June 8; *Financial Times*, April 25/26, June 6; *The New York Times*, April 8, 14, 20, 23 and 25, May 20 and 29, June 19, 21, 22 and 24; *Diario de Noticias* [Lisbon], 1 May, in *JPRS-TND-92-014*, 14 May; *International Herald Tribune*, May 21; David Albright and Mark Hibbs, 'Iraq's Shop-Till-You-Drop Nuclear Program', *Bulletin of the Atomic Scientists*, 48(3), April, pp. 27-37; David Albright and Mark Hibbs, 'It's All Over At Al Atheer', *Bulletin of the Atomic Scientists*, 48(5), June, pp. 8-10; *The Times* [London] 17 June; *The Washington Post*, June 26 and 27)

- In **Israel**, the union representing workers at the Dimona reactor is reported to have called for an external inspection of safety at the plant. (*Nucleonics Week*, June 18)
- In 1985 **Romania** secretly extracted about 100 milligrams of pure plutonium from an indigenously produced fuel rod irradiated in its Triga research reactor. Although it failed to report this to the IAEA, as it should have done pursuant to its safeguards agreement, Romania is not held to be in violation of the agreement since the experiment was carried out during the Ceaucescu regime and was reported to the IAEA by the present authorities, as soon as it came to light. (*NuclearFuel*, June 22; *Nucleonics Week*, 25 June)
- Central European media continue to write of illicit attempts to sell nuclear material hailing from eastern European nuclear installations. Most of these involve small quantities of natural or low-enriched uranium that are offered at exorbitant prices, and 'red mercury' (a compound described as significant in the production of nuclear weapons, but which in some cases at least has turned out to be a bogus material), for which Poland appears to be a favourite transit route. In Germany the trial of three persons accused of importing 1.1 kg of low-enriched reactor fuel has started. In recent weeks, a total of ten persons hailing from several states in the region were arrested in Vienna trying to sell various small amounts of nuclear material, including 1.2 kilograms of uranium pellets from a VVER-1000 fuel element, 55 grams of reportedly 'pure' (highly enriched?) U-235, and three kilograms of uranium of various enrichment levels. Other would-be vendors were found to possess milligram-quantities of plutonium, reportedly taken from, or intended for, smoke detectors. (*Prawo I Zycie* [Warsaw], 14 March, in *JPRS-TND-92-013*, 29 April; *Wirtschaftswoche* [Vienna], 16 April, in *JPRS-TND-92-012*, 22 April; *Der Standard* [Vienna], 4 June; *ENS NucNet Insider* No. 33/92, 5 June; *Die Presse* [Vienna], 12 and 25 June; *Frankfurter Allgemeine Zeitung*, 12 June; *Süddeutsche Zeitung*, 27 June)

II. PPNN Activities

- The PPNN Core Group held its eleventh semi-annual meeting from 22 to 24 May at the Sporthotel Erbismühle, near Frankfurt, Germany. The meeting was organised in conjunction with the Peace Research Institute, Frankfurt [PRIF], which also provided partial funding for the local costs of the meeting. All members of the PPNN Core Group were present, with the exception of Dr Lewis Dunn.
- On 23 and 24 May the Core Group convened a seminar for Senior Government Officials on *The New Europe and Nuclear Non-Proliferation* attended by nominees from seven states formerly part of the USSR; eight EC states; five Eastern European states and five Scandinavian and former neutral states; ten members of the PRIF Non-Proliferation Project Working Group; six observers from international and other organisations [including the UN, the IAEA, EURATOM and NATO] and six invited paper presenters and discussants.

The Seminar was divided into three sessions: The Non-Proliferation Regime and European Security; Peaceful Nuclear Activities and Europe; and A Common European Non-Proliferation Strategy. Nine papers were discussed in the course of the Conference: *The Situation in the former USSR: Consequences for the Nuclear Non-Proliferation Regime* by Oleg Grinevsky; *Nuclear Non-Proliferation Threats in Europe: What is needed to Cope with Current and Future Challenges* by John Roper; *Nuclear Proliferation Threats from Outside of Europe: Illusion or Reality* by Cesare Merlini; *Nuclear Fuel Cycle Policies in Europe* by Jan Murray; *Nuclear Safeguards and New Verification Approaches in Europe* by David Fischer; *Sticks and Carrots: Nuclear Co-operation and Export Controls as Instruments of a European Non-Proliferation Policy* by Harald Müller; *How Could Europe Strengthen the NPT* by Ben Sanders and John Simpson; *A European Role in Regions of Proliferation Concern* by Francois Heisbourg and *When Europe Closes Ranks: Good, Bad or Mixed News for the Rest of the World* by Olu Adeniji. [Copies may be obtained from PPNN's Southampton Office]. This was the first gathering of officials concerned with nuclear non-proliferation matters from all of Europe.

- The next PPNN Study, Number 3, entitled **A New Nuclear Triad: The Non-Proliferation of Nuclear Weapons, International Verification and the International Atomic Energy Agency**, by David Fischer, Ben Sanders, Lawrence Scheinman and George Bunn will be launched on 10 September at a Press Conference in Washington.
- The Twelfth PPNN Core Group meeting, organised on behalf of PPNN by the Mountbatten Centre for International Studies in conjunction with the Japanese Atomic Industrial Forum and, will be held over the weekend of 27-29 November 1992 at the Keidanren Guest House, Sunto-gun, Shizuoko Prefecture, Japan. This meeting will address the inter-relationships between the global nuclear non-proliferation system and non-proliferation issues in the East Asian region.
- An enlarged and updated version of the PPNN Briefing Book was published by Longmans Publishers in the UK in June. *Nuclear Non-Proliferation: A Reference*

Handbook, edited and compiled by Darryl Howlett and John Simpson, is available at a special offer price to recipients and readers of the Newsbrief if ordered before 30 September 1992.

- John Simpson participated in a meeting of nuclear non-proliferation specialists from the states of the CIS, organised by the Monterey Institute of International Studies from 6-10 April, and then lectured at a seminar on non-proliferation for teachers in the University of California system organised by the Institute for Global Conflict and Co-operation, La Jolla and Lawrence Livermore National Laboratory at Pleasanton, California on 10-11 April. He attended a meeting of the UN Secretary-General's Advisory Board for Disarmament Affairs in New York from 22-25 May. Darryl Howlett presented papers, jointly written with John Simpson, on Nuclear Non-Proliferation in the Pacific and the Indian Ocean Areas, at conferences on Arms Control in the Post-Cold War World organised by the Peace Research Centre, Australian National University, in Canberra on 25-26 June and in Perth on 29-30 June.
- On 1 June, Harald Müller, Ben Sanders and John Simpson participated from their respective locations in a joint telephonic briefing on 'Nuclear Proliferation and European Security' organised from Washington, D.C., by the Center for War, Peace and the News Media of New York University. Ten US journalists took part, as did representatives from non-governmental groups.
- On 24 May, Ben Sanders and Harald Müller participated in a briefing for the German media on the Erbismühle PPNN seminar, attended by about a dozen television, radio and press journalists.

III. Other Non-Governmental Groups Active in Related Areas

- The Canadian Minister of Finance announced in his budget statement of 25 February that it was the intention of his Government to eliminate the **Canadian Institute for International Peace and Security**. The Institute expects to continue its activities until the Act of Parliament which established it in 1984 has been repealed.
- The **UK National Nuclear Non-Proliferation Study Group** held its ninth meeting on Friday, 5th June. Among subjects discussed were supplier controls, the disposition and disposal of nuclear weapons and fissile materials in the CIS and the current non-proliferation situation in Latin America and South Asia.
- The **Monterey Institute for International Studies** held a conference on 'The Nuclear Predicament in the Former Soviet Union' from 6-10 April, as part of the Institute's CIS Non-proliferation Project. About 35 participants from Belarus, Kazakhstan, Russia and the Ukraine were joined by scholars and officials from Western Europe and North America for the meeting.
- The members of the Non-Proliferation Project of the **Peace Research Institute Frankfurt** held a one-day meeting at Erbismühle, Germany on 25 May. The meeting involved surveys of the current global nuclear non-proliferation situation and the Iraqi monitoring programme, as well as a planning session on future work.

- The **International Foundation** held meetings in Bonn and London over the period 16-18 June to examine the issues of the dismantling of the super-power nuclear arsenals and the disposal of plutonium stocks.
- Over the period 25-30 June, the **Peace Research Centre**, Australian National University, held two conferences on Arms control in the Post-Cold War World. The first, in Canberra, concentrated on the Pacific area and the second, in Perth, on the Indian Ocean. Both addressed the evolution of regional nuclear non-proliferation regimes.
- An **Association for Nonproliferation** was set up in Moscow on March 27, with the goal of promoting non-proliferation of weapons of mass destruction. Its aim is to co-ordinate the activities of experts on non-proliferation and related issues in academic, governmental and industrial circles. Those interested in further details should apply to the Chairman of its Supervising Board, Dr Andrei V. Zagorsky at 76, Vernadsky Street, Moscow, 117454, Russia.

IV. Recent Publications

- Books:

Hans Günter Brauch, Henny J. van der Graaf, John Grin and Wim A. Smit, editors, **Controlling the Development and Spread of Military Technology**, VU University Press, Amsterdam 1992, 406 pp.

David Fischer, **Stopping the Spread of Nuclear Weapons: The Past and the Prospects**, Routledge, London and New York, 1992, 336 pp.

Patrick A. Garrity and Steven A. Maaranen, editors, **Nuclear Weapons in the Changing World: Perspectives from Europe, Asia and North America**, Center for National Security Studies, Los Alamos National Laboratory, Plenum Publishing Corporation New York, 1992, 266 pp.

Darryl Howlett and John Simpson, editors, **Nuclear Non-Proliferation: A Reference Handbook**, Harlow: Longman's Current Affairs, Harlow, 1992, 416 pp.

- Articles and Other Materials:

Hans Blix, 'IAEA Safeguards: New Challenges', **DISARMAMENT, A periodic Review by the United Nations**, XV(2), 1992, pp. 33-47

Christoph Bluth, Out of Control? The Future of the Soviet Nuclear Arsenal, **Bulletin of Arms Control**, No. 5, February 1992, pp. 2-6.

Donald G. Boudreau, 'On Advancing Non-Proliferation', **Strategic Analysis**, XIV(11), February 1992, pp. 1327-1342.

George Bunn, **Does the Non-Proliferation Treaty (NPT) require its non-nuclear-weapon members to permit inspection by the International Atomic Energy Agency (IAEA) of nuclear activities that have not been reported to the IAEA?**, Center for International Security and Arms Control, Stanford University, April 1992, 12 pp.

Eric Chauvistré, 'The Implications of IAEA Inspections under Security Council Resolution 687', United Nations Institute for Disarmament Research, **UNIDIR Research Paper No. 11**, New York, 1992, UN Sales no. UNIDIR 92/6, 81 pp.

Eve Cohen, 'Nonproliferation in the Former Soviet Union: The Role of International Science and Technology Centers', An Interview with Ambassador Robert Galucci, **Eye on Supply**, No. 6, Spring 1992, pp. 66-67.

Savita Datt, 'Strengthening Safeguards and Tightening Controls: The Beginning of the End?', **Strategic Analysis**, XIV(10), pp. 1197-1208.

Rolf Ekéus, 'Unearthing Iraq's Arsenals', Interview, **Arms Control Today**, April 1992, 22(3), pp. 6-9.

Aranka Gyuk and Lynn M. Huizenga, 'The Nonproliferation Predicament in the Former Soviet Union: Conference Highlights', *Eye on Supply*, No. 6, Spring 1992, pp 68-71.

Beatrice Heuser, 'Workshop on Nuclear Proliferation' (Summary of contributions and conclusions of a workshop held at King's College, London, on 7-8 January), in *Bulletin of Arms Control*, No. 5, February 1992, pp. 7-11.

Vic Hogsett, **Red Mercury: caveat emptor**, Office of Nonproliferation Technology Support, United States Department of Energy, in *Critical Technologies Newsletter*, April 1992, 10(1).

Ryukichi Imai, 'NPT Safeguards Today and Tomorrow', *DISARMAMENT, A periodic Review by the United Nations*, XV(2), 1992, pp. 47-57.

Mark G. McDonough, **Selected Analyses, Findings and Recommendations**, Summary of the Conference on Strengthening the Non-Proliferation Regime, Carnegie Endowment for International Peace, March 18-19, 1992, Washington June 8, 1992, 32 pp.

Tariq Rauf, 'New Nuclear Nightmares: Loose Nukes In The Former USSR?', *The Arms Control Centre Barometer*, Winter/Spring 1991-92, pp. 10, 11 and 18.

John R. Redick, **Argentina and Brazil's New Arrangement for Mutual Inspections and IAEA Safeguards**, Nuclear Control Institute, Washington D.C., February 1992, 6 pp.

Lawrence Scheinman and David A.V. Fischer, 'Managing the Coming Glut of Nuclear Weapon Materials', *Arms Control Today*, March 1992, 22(2), pp. 7-12.

Lawrence Scheinman, 'The Non-Proliferation Treaty: On the Road to 1995', *IAEA Bulletin*, No. 2, 1992, May, 8 pp.

Lawrence Scheinman, 'Safeguards: New Threats and New Expectations', *DISARMAMENT, A periodic Review by the United Nations*, XV(2), 1992, pp. 58-76.

Natahan Shamuyarira, 'Africa as a Nuclear-Weapon-Free Zone' (continued), *DISARMAMENT, A periodic Review by the United Nations*, XV(1), 1992, pp. 107-125.

Leonard S. Spector, **Deterring Regional Threats from Nuclear Proliferation**, Strategic Studies Institute, U.S. Army War College, March 12, 1992, 28 pp.

Leonard S. Spector, **A Historical and Technical Introduction to the Proliferation of Nuclear Weapons**, Carnegie Endowment for International Peace, June 1992, 48 pp.

Roland Timerbaev, 'A Major Milestone in Controlling Nuclear Exports', *Eye on Supply*, No. 6, Spring 1992, pp 58-65.

The New Era in U.S. Export Controls: **Report of a Workshop of September 24-25, 1991**, convened by the Academy Industry Program and the Committee on Science, Engineering and Public Policy of the National Academy of Sciences, National Academy of Engineering and Institute of Medicine; National Academy Press, Washington, D.C., 1992, 53 pp.

Special Section on 'Nuclear Proliferation', *Harvard International Review*, Spring 1992 (Articles by John Simpson, Joseph S. Nye, John Glenn, I.K. Gujral, William C. Potter, and an interview with Robert Galucci), pp. 4-29.

V. Comments From Readers

Ambassador Julio Carasales of Argentina has drawn attention to the item on page 11 of the Spring 1992 issue of the *Newsbrief*, Number 17, which refers to **Argentina** as giving high priority to the development of a nuclear submarine. The country in question is obviously **Brazil**. The editor apologizes for this error.

Citing references in *Newsbrief* Numbers 16 and 17 to statements ascribed to **Iran's** Vice-President Mohajerani, calling for 'an Islamic bomb', Ms. Elahe Mohtasham has called attention to the BBC Summary of World Broadcasts, Middle East, of 15 November 1991, which quoted an IRNA (Iran Radio News) item of 13 November, in which Ayatollah

Mohajerani was said to have refuted the remark attributed to him that his country was trying to gain access to unconventional weapons. He was further quoted as saying that 'Iran was in no way after obtaining nuclear and unconventional arms' and that any remark or attribution not complying with 'this clear and firm stance' would be invalid.

VI. Documentation

1. Arrangements adopted at the Meeting of Adherents to the Nuclear Suppliers Guidelines, Warsaw, 31 March-3 April 1992.

Guidelines for Transfers of Nuclear-Related Dual-Use Equipment, Material, And Related Technology

Objective.

1. With the objective of averting the proliferation of nuclear weapons, suppliers have had under consideration procedures in relation to the transfer of certain equipment, material, and related technology that could make a major contribution to a 'nuclear explosive activity' or an 'unsafeguarded nuclear fuel-cycle activity'. In this connection, suppliers have agreed on the following principles, common definitions, and an export control list of equipment, material, and related technology. The Guidelines are not designed to impede international cooperation as long as such cooperation will not contribute to a nuclear explosive activity or an unsafeguarded nuclear fuel-cycle activity. Suppliers intend to implement the Guidelines in accordance with national legislation and relevant international commitments.

Basic Principle.

2. Suppliers should not authorize transfers of equipment, material, or related technology identified in the Annex: - for use in a non-nuclear-weapon state in a nuclear explosive activity or an unsafeguarded nuclear fuel cycle activity, or - in general, when there is an unacceptable risk of diversion to such an activity, or when the transfers are contrary to the objective of averting the proliferation of nuclear weapons.

Explanation of Terms.

3. (a) 'Nuclear explosive activity' includes research on or development, design, manufacture, construction, testing or maintenance of any nuclear explosive device or components or subsystems of such a device.
- (b) 'Unsafeguarded nuclear fuel-cycle activity' includes research on or development, design, manufacture, construction, operation or maintenance of any reactor, critical facility, conversion plant, fabrication plant, reprocessing plant, plant for the separation of isotopes of source or special fissionable material, or separate storage installation, where there is no obligation to accept International Atomic Energy Agency (IAEA) safeguards at the relevant facility or installation, existing or future, when it contains any source or special fissionable materials; or of any heavy water production plant where there is no obligation to accept IAEA safeguards on any nuclear material produced by or used in connection with any heavy water produced therefrom; or where any such obligation is not met.

Establishment of Export Licensing Procedures.

4. Suppliers should establish export licensing procedures for the transfer of equipment, material, and related technology identified in the Annex. These procedures should include enforcement measures for violations. In considering whether to authorize such transfers, suppliers should exercise prudence in order to carry out the Basic Principle and should take relevant factors into account, including:
 - (a) Whether the recipient state is a party to the Nuclear Non-Proliferation Treaty (NPT) or to the Treaty for the Prohibition of Nuclear Weapons in Latin America (Treaty of Tlatelolco), or to a similar international legally-binding nuclear non-proliferation agreement,

and has an IAEA safeguards agreement in force applicable to all its peaceful nuclear activities;

- (b) Whether any recipient state that is not party to the NPT, Treaty of Tlatelolco, or a similar international legally-binding nuclear non-proliferation agreement has any facilities or installations listed in paragraph 3 (b) above that are operational or being designed or constructed that are not, or will not be, subject to IAEA safeguards;
- (c) Whether the equipment, material, or related technology to be transferred is appropriate for the stated end-use and whether that stated end-use is appropriate for the end-user;
- (d) Whether the equipment, material, or related technology to be transferred is to be used in research on or development, design, manufacture, construction, operation, or maintenance of any reprocessing or enrichment facility;
- (e) Whether governmental actions, statements, and policies of the recipient state are supportive of nuclear non-proliferation and whether the recipient state is in compliance with its international obligations in the field of non-proliferation;
- (f) Whether the recipients have been engaged in clandestine or illegal procurement activities; and
- (g) Whether a transfer has not been authorized to the end-user or whether the end-user has diverted for purposes inconsistent with the Guidelines any transfer previously authorized.

Conditions for Transfers.

5. In the process of determining that the transfer will not pose any unacceptable risk of diversion, in accordance with the Basic Principle and to meet the objectives of the Guidelines, the supplier should obtain, before authorizing the transfer and in a manner consistent with its national law and practices, the following: a) a statement from the end-user specifying the uses and end-use locations of the proposed transfers; and b) an assurance explicitly stating that the proposed transfer or any replica thereof will not be used in any nuclear explosive activity or unsafeguarded nuclear fuel-cycle activity.

Consent Rights over Retransfers.

6. Before authorizing the transfer of equipment, material, or related technology identified in the Annex to a country not adhering to the Guidelines, suppliers should obtain assurances that their consent will be secured, in a manner consistent with their national law and practices, prior to any retransfer to a third country of the equipment, material, or related technology, or any replica thereof.

Concluding Provisions.

7. The supplier reserves to itself discretion as to the application of the Guidelines to other items of significance in addition to those identified in the Annex, and as to the application of other conditions for transfer that it may consider necessary in addition to these provided for in paragraph 5 of the Guidelines.
8. In furtherance of the effective implementation of the Guidelines, suppliers should, as necessary and appropriate, exchange relevant information and consult with other states adhering to the Guidelines.
9. In the interest of international peace and security, the adherence of all states to the Guidelines would be welcome.

List of contents of Annex

Industrial Equipment

Spin-forming and flow-forming machines
 'Numerical control units' - machine tools
 Dimensional inspection systems
 Vacuum induction furnaces
 Isostatic presses
 Robots and end effectors
 Vibration test equipment
 Furnaces - arc remelt, electron beam, and plasma

Materials

Aluminum, high strength
 Beryllium
 Bismuth, high purity

Boron, isotopically enriched in boron-10
 Calcium, high purity
 Chlorine trifluoride
 Crucibles made of materials resistant to liquid actinide metals
 Fibrous and filamentary materials
 Hafnium
 Lithium, isotopically enriched in lithium-6
 Magnesium, high purity
 Maraging steel, high strength
 Radium
 Titanium alloys
 Tungsten
 Zirconium

Uranium Isotope Separation Equipment and Components

Electrolytic cells for fluorine production
 Rotor and bellows equipment
 Centrifugal multiplane balancing machines
 Filament winding machines
 Frequency changers
 Lasers, laser amplifiers and oscillators
 Mass spectrometers and mass spectrometer ion sources
 Pressure measuring instruments, corrosion-resistant
 Valves, corrosion resistant
 Superconducting solenoidal electromagnets
 Vacuum pumps
 Direct current high-power supplies, 100 V or greater
 High voltage direct current power supplies, 20,000 V or greater
 Electromagnetic isotope separators

Heavy Water Production Plant Related Equipment (other than trigger list items)

Specialized packing for water separation
 Pumps for potassium amide/liquid ammonia
 Water-hydrogen sulfide exchange tray columns
 Hydrogen-cryogenic distillation columns
 Ammonia converters or synthesis reactors

Implosion Systems Development Equipment

Flash X-ray equipment
 Multistage light gas guns/high velocity guns
 Mechanical rotating mirror cameras
 Electronic streak and framing cameras and tubes
 Specialized instrumentation for hydrodynamic experiments

Explosives and Related Equipment

Detonators and multipoint initiation systems
 Electronic components for firing sets
 Switching devices
 Capacitors
 Firing sets and equivalent high-current pulsers, for controlled detonators
 High explosives relevant to nuclear weapons

Nuclear Testing Equipment and Components

Oscilloscopes
 Photomultiplier tubes
 Pulse generators, high speed

Other

Neutron generator systems
 General nuclear related equipment
 Remote manipulators
 Radiation shielding windows
 Radiation-hardened TV cameras
 Tritium, tritium compounds and mixtures
 Tritium facilities or plants and components therefor
 Platinized carbon catalysts
 Helium-3
 Alpha-emitting radionuclides

Statement on full scope safeguards

- (1) At their meeting in Warsaw on April 3, 1992, the Adherents to the Nuclear Suppliers Guidelines,
 - desiring to contribute to an effective non-proliferation regime, and to the widest possible implementation of the objectives of the Treaty on the Non-Proliferation of Nuclear Weapons,

- seeking to promote international co-operation in the research, development and safe use of nuclear energy for peaceful purposes,

have adopted the following policy on full scope safeguards as a condition of future nuclear supplies:

- (a) The transfer of nuclear facilities, equipment, components, material and technology as referred to in the export trigger list of the Guidelines for Nuclear Transfers (see INFCIRC/254), should not be authorised to a non-nuclear-weapon State unless that State has brought into force an agreement with the IAEA requiring the application of safeguards on all source and special fissionable material in its current and future peaceful nuclear activities.
 - (b) Transfers covered by paragraph (a) to a non-nuclear-weapon State without such a safeguards agreement should only be authorised in exceptional cases when they are deemed essential for the safe operation of existing facilities and if safeguards are applied to those facilities. Suppliers should inform and, if appropriate, consult in the event that they intend to authorise or to deny such transfers.
 - (c) This policy does not apply to existing agreements and contracts; however, adherents to the Guidelines underline the importance of making all supplies in conformity with it.
 - (d) Additional conditions of supply may be applied as a matter of national policy.
- (2) The Adherents to the Nuclear Suppliers Guidelines appeal to all states which export nuclear facilities, equipment, components, material or technology to adopt the same policy.
 - (3) The Adherents to the Nuclear Suppliers Guidelines invited the Chairman of the meeting to communicate this statement to the Director-General of the IAEA for information of member states.

2. Argentina's 'Regime for Sensitive Exports'; IAEA document INFCIRC/404

Declaration of the Government of Argentina on a Regime for Sensitive Exports, made by the President of Argentina on 27 April 1992

The proliferation of weapons of mass destruction poses a serious threat to peace and security in the world and is one of the great challenges facing us today. All States should present a firm and united front in their attempts to check it.

With this in mind, Argentina, which has reached a high level of development in certain particularly sensitive fields, feels it is its obligation to establish effective controls for exports which might have a bearing on the production of such weapons. Therefore, the Executive Power has on this day established a regulatory code for foreign sales of any materials, equipment, technology, technical assistance and services relating to nuclear or missile technology, and of chemical substances which might be used in the production and deployment of missiles and nuclear, chemical and bacteriological weapons.

The new regulations do not unduly restrict legitimate commerce, but incorporate international criteria and bring our arrangements in this respect into line with the controls established by other countries. Other effective international criteria which might be developed in the future will also be successively incorporated into our national legislation.

This far-reaching measure should help extend markedly the access we have to high-level technology via international co-operation.

Description of the New Regime

(A) General criterion

It will be mandatory to obtain prior authorization for exports covered by the new regulations.

Applications will be analysed case by case, and the final decision will take account of Argentina's firm commitment to the non-proliferation of weapons of mass destruction, international considerations (individual and regional level, etc) and the specific conditions of each concrete case.

(B) Scope

1. Nuclear equipment and materials

Prior issue of a licence will be required for the export of reactors and enriched uranium, and of plants, equipment and components for the conversion and enrichment of uranium, the reprocessing of nuclear fuel, the production of heavy water, and the fabrication of nuclear fuel. The materials included in this category are natural and depleted uranium, thorium, enriched uranium, plutonium, nuclear-grade graphite, deuterium and heavy water and radioactive isotopes.

Within this framework:

- As a general rule, exports of materials, equipment, technology, technical assistance and/or services related to the conversion and enrichment of uranium, fuel reprocessing, the production of heavy water and the fabrication of plutonium will not be authorized;
- Exports of reactors and enriched uranium, or related technology, may be authorized on condition that a bilateral agreement on nuclear co-operation for peaceful purposes is in force with the country involved. In addition, the latter should: (a) be party to a full-scope safeguards agreement with the IAEA; (b) specifically confirm that the material exported by Argentina will not be used for any activity related to nuclear explosives; (c) implement suitable safety standards for the exported materials; and (d) agree to request permission from the Argentine Government before transferring the exported material, or material derived from that material or produced by reprocessing that material;
- The same criterion will be applied to nuclear technical assistance, and to the export of certain non-nuclear products which could be used for non-peaceful nuclear developments. The list of these dual-use products will be drawn up by the National Commission for the Control of Sensitive Exports and Military Material;
- Any transfer in the nuclear field which is not regulated by the above paragraphs to countries which have not signed full-scope safeguards agreements with the IAEA will require prior issue of an export licence;
- The National Executive Power will review the export contracts and agreements in the nuclear field which predate this new legal framework, with a view to reaching a decision within a space of 30 days as to whether they can remain in force.

2. Missiles and missile technology

- We have arranged that the lists of products and criteria recommended in the so-called 'Missile Technology Control Regime' (MTCR), which Argentina decided to adhere to on 29 May 1991, will be incorporated in the national legislation. That list includes products which the country has produced or imported, or which it might produce in the future.
- The export, re-export or transfer of any material, equipment, technology, technical assistance and/or services included in the Annex to the MTCR will require prior issue of a licence.
- As a general rule, exports, re-exports or transfers which might contribute to the development of missiles will not be authorized. This category includes exports which might be used to develop special launching vehicles, in accordance with the MTCR.

3. Chemical and bacteriological weapons

- The new regulations specify that prior authorization must be obtained for exports, re-exports or transfers of certain chemical substances, or families of substances, which have a dual use and which can serve as a basis for the production of chemical and/or bacteriological weapons.
- Prior issue of a licence will be required for exports, re-exports or transfers of a number of chemical substances used commercially which could be used to manufacture chemical weapons. These substances, most of which are called 'precursors', have been identified internationally. Not all of them are regularly produced within this country.
- As a general rule, exports, re-exports or transfers of chemical substances, including toxins, which might be used to produce chemical and/or bacteriological weapons will not be authorized.

(C) Obligation of exporters

Any person exporting any chemical substance or material, equipment, technology, technical assistance and/or services not specifically covered by the new regulations will be obliged to obtain an export licence if they know or suspect that the export will be or could be used in projects or activities connected with weapons of mass destruction.

(D) Sanctions

Any export and/or export authorization which does not comply with the terms of this Decree will incur the appropriate sanctions under the Customs Code, without thereby excluding the possibility that such non-compliance might constitute a crime under the Penal Code. In addition, the Executive Power will be proposing to the Honourable Congress of the Nation that specific sanctions be incorporated in the Penal and Customs Codes to check violations of the export standards relating to weapons of mass destruction.

(E) Participation of Argentine citizens

- As a general rule, the Executive Power will not authorize either the direct or indirect involvement of officials or employees of the State in projects or activities in third countries which are connected with weapons of mass destruction.
- Moreover, the direct or indirect involvement of individuals or firms in such projects or activities will be discouraged.

(F) Co-ordination with other countries

Argentina will co-ordinate with other States its policies on exports which might contribute to the production of weapons of mass destruction, with a view to consolidating an effective international control system in this field.

(G) Reports to Congress

The Executive Power will report regularly to the Honourable Congress of the Nation on the applications which have been received for sensitive exports and exports of military material, and on the licences which are being granted or denied in this respect under the new regulations.

(H) National Commission for the Control of Sensitive Exports and Military Material

- The new regulations bring into being the National Commission for the Control of Sensitive Exports and Military Material, which replaces the former Commission for Policy Co-ordination on the Export of Military Material (Decree 1097/85). This body will retain the powers of its predecessor, and it will have additional powers relating to the control of nuclear, missile, chemical and bacteriological exports.
- The Commission will promote the various regulatory measures required in various fields for the application of the new Regime for Sensitive Exports.

3. New partnership approach to the implementation of safeguards in the Community, by the IAEA and Euratom: text of joint declaration

Effective and Efficient Implementation of Safeguards by the IAEA and EURATOM under the Agreement (INFCIRC/193)

1. The Director General of the IAEA Dr. Blix and Commissioner Cardoso e Cunha have reviewed the implementation of safeguards according to INFCIRC/193.

2. They concluded that further efforts should be made to enhance the efficiency and effectiveness of safeguards implementation.
3. To this end they concluded that the time has come to strengthen safeguards collaboration in a way that takes into account not only the effectiveness of safeguards but also safeguards efficiency and, in so doing, gives full effect to the purposes of the Agreement.
4. This will be founded on:
 - (i) The initiation of a new partnership approach to replace the existing approaches of Observation and Joint Teams.
 - (ii) The translation of this concept into practical arrangements under the guidance of the high level Liaison Committee.
 - (iii) A re-evaluation of the role of the Liaison Committee and its relationship to its subsidiary bodies.
5. Subject to the ability of both organizations to satisfy the requirements of their criteria and guidelines respectively the new approach will be based on the following elements:
 - (i) The optimisation of the necessary practical arrangements and the use of commonly agreed:
 - safeguards approaches
 - inspection planning and procedures
 - inspection activities
 - inspection instruments, methods and techniques.
 - (ii) The inspection activities will be performed on the basis of the principle of one-job-one-man supplemented by quality control measures to enable both organisations to satisfy their respective obligations to reach their own independent conclusions and required assurances. These arrangements will be designed and performed in such a manner that they do not result in unnecessary duplication of effort.
 - (iii) Use of commonly shared analysis capabilities in order to reduce the number of samples to be taken, transported and analysed. Cooperation in research and development and in the training of inspectors with the aim to achieve a reduction of resources spent on both sides and to lead to commonly agreed products and procedures.
 - (iv) Increasing common use of technologies to replace, to the extent possible, the physical presence of inspectors by appropriate equipment.
6. The partnership approach will allow both the IAEA and Euratom to meet their respective responsibilities under the Agreement (INFCIRC/193). The necessary practical arrangements will be established by the Liaison Committee combining full transparency in planning and coordination with partnership in the inspections and with common evaluation.
7. The Director General of the IAEA Dr. Blix and Commissioner Cardoso e Cunha expect that this approach will allow considerable rationalization of resources resulting in a significant reduction in inspection efforts under the Agreement. They request the Liaison Committee to report to them as soon as possible and not later than the end of the year on progress made in the implementation of the new partnership approach.

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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