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Programme for Promoting Nuclear Non-Proliferation, Newsbrief, Number 14

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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

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NEWSBRIEF

Summer 1991

Editorial note

This issue of the *Newsbrief* refers to events related to the spread of nuclear-weapon capabilities that took place, or on which information came to hand, in the period April/June 1991.

The quarterly *Newsbrief* is published as part of the efforts of the Programme for Promoting Nuclear Non-Proliferation (PPNN) to help deter the spread of nuclear-weapon capabilities. It seeks to present an objective, factual and balanced picture of current events relating to the spread of nuclear-weapon capabilities to additional states and of developments tending to inhibit that spread. The *Newsbrief* also refers to relevant developments relating to the peaceful uses of nuclear energy.

PPNN's *Newsbriefs* are based on publicly available items derived from reputable and reliable sources. As editor of the *Newsbrief*, the Chairman of PPNN's Core Group is responsible for its contents. Unless expressly stated, the inclusion of an item does not imply the agreement of the members of the Core Group collectively or individually, either with its substance or with its relevance to PPNN's activities.

The limited size of the *Newsbrief* makes it necessary to choose among items of information and to present them in condensed form. Unless otherwise stated, all reference dates given are in 1991.

Readers who wish to comment on the manner in which an item is presented in the *Newsbrief*, or to draw attention to information they would wish to see included, are invited to send their remarks to the editor for publication. The present issue carries two communications of this nature.

I. Topical Developments

NOTE: Current developments regarding **Iraq** come under several of the headings used in the *Newsbrief*. Because they directly affect the IAEA's activities they are summarized here in Section I d.: **IAEA Developments**.

a. Background

France has announced its intention to join the NPT: the fourth nuclear weapon-state to do so and the only one that is not a depository state. The announcement was part of a wide-ranging proposal for global arms control, presented by President Mitterand on 3 June.

The date of the meeting between Presidents Bush and Gorbachov is not yet known. Outstanding questions on the interpretation of the Treaty on the Reduction of Conventional Weapons in Europe have been settled, but there are still a number of issues to be resolved before the treaty on the reduction of strategic weapons – Start I – can be signed.

The President of the United States has presented a plan for arms control in the Middle East which provides for a verifiable ban on production and acquisition of weapons-grade enriched uranium and separated plutonium;

an end to the production of such material; and the creation of a nuclear-weapon-free zone in the region.

Algeria has said that the research reactor supplied to it by China will be submitted to international safeguards.

The disclosure that Iraq has been engaged for years in a secret effort to produce weapons-grade nuclear material raises concern about the adequacy of information gathering in the field. Iraq has impeded access of inspectors sent to make on-site investigations.

The Democratic People's Republic of Korea has announced that it is prepared to sign the safeguards agreement with the IAEA pursuant to the NPT but, because it still seems to link this move to the withdrawal of US nuclear arms from the area, its practical value is not entirely clear.

South Africa has announced that it will accede to the NPT; Tanzania and Zambia have just done so.

The unrest in Yugoslavia has raised concern about the security of the nuclear power station at Krsko. Emergency protection procedures have been activated and the plant is surrounded by military forces.

b. Non-Proliferation Developments

- Negotiations between **Argentina, Brazil** and the **IAEA** are expected to lead to a safeguards agreement in the current year. (*Gazeta Mercantil* [Sao Paulo] 8 March, in **JPRS-TND-91-006**, 23 April; direct information).
- **Argentina** has announced it will dismantle its Condor-2 ballistic missile development programme so as to make any resumption impossible. The move, resisted by the Minister of Defence, the military and by conservative members of parliament, seems to be in response to earlier criticism that, though 'mothballed', the programme might be started again. The President has taken control of the missile programme

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away from the military and put it under his own authority (*Noticias Argentinas*, 24 April, in *JPRS-TND-91-007*, 20 May; *Buenos Aires Herald*, 5 and 6 May and *Telam* [Buenos Aires], 6 May, in *JPRS-TND-91-008*, 31 May; *The New York Times*, 14 and May 30).

- In **Australia**, which has 30 percent of the world's known uranium reserves but produces only 10%, the governing Labour Party has decided not to lift the restrictions on uranium mining, which were imposed for non-proliferation reasons (*International Herald Tribune*, June 28).
- **China's** Premier Li Peng, meeting with IAEA Director General Dr. Hans Blix, has affirmed that his country opposes the proliferation of nuclear weapons and does not wish to contribute to it. A Foreign Ministry spokesman, speaking in connection with the supply of a reactor to Algeria, stated that China sets three conditions for its nuclear exports: exclusively peaceful use; submission to IAEA safeguards; and no re-transfer to any third country. During a visit to Japan in June, China's Foreign Minister was expected to discuss the possibility of his country becoming a party to the NPT; France is also said to press this point. The President of the **United States** has announced that in renewing China's most-favoured-nation status he would impose some restrictions, one of them a ban on the export of high-speed computers used in testing missiles. Opposition in the US Congress to the continuation of China's status as a most-favoured nation is fuelled by the news that it has supplied a reactor to Algeria. A declassified US Army intelligence document indicates that in 1986 China made a study for the construction of a nuclear power plant in Iraq which was apparently to be built and operated covertly (*Xinhua* [Beijing], 1 April, in *JPRS-TND-91-006*, 23 April; *Xinhua* and *Zhongguo Xinwen She*, 30 April, in *JPRS-TND-91-007*; *Nucleonics Week*, May 23, June 27 & July 4; *The New York Times*, May 28; *Press release of the Nuclear Control Institute* [Washington], July 1).
- The **Democratic People's Republic of Korea** has advised the IAEA that it has decided to accept the standard text of the safeguards agreement with the IAEA, with a view to its finalization in September. Pursuant to the NPT, to which it acceded in 1985, North Korea should have concluded that agreement five years ago. However, having negotiated the substance of an agreement with the IAEA several years ago the Government of North Korea declared that it would sign it only if the United States undertook to remove its nuclear forces from the Korean peninsula. North Korea's position has long been a source of international concern, given the reports referred to in I.g below. If North Korea still seeks to condition its final agreement on the withdrawal of US forces from the Korean Peninsula, the value of this move is uncertain. The matter was discussed by the Foreign Minister of China during a visit to Tokyo, in June, and both China and the USSR have urged the DPRK to accept the agreement unconditionally (*Moscow Radio*, 15 April, and *Yonhap* [Seoul], 16 April both in *JPRS-TND-91-007*, 20 May; *Nucleonics Week*, June 6 & 27; *The New York Times*, June 9; *News Release of the Embassy of Japan*, Ottawa, June 14; *Defense News*, June 17).
- President Mitterand of **France** has announced that his country will sign (sic) the NPT, as part of a global disarmament plan he introduced on 3 June, which includes making the Middle East into a zone free of weapons of mass destruction. France hopes that **China**, the only other nuclear-weapon state outside NPT, will also join the Treaty

(*Le Monde*, 4 June; *Nucleonics Week*, June 6; *NuclearFuel*, June 10).

- In **Germany** the Upper House of Parliament has rejected a bill that would allow the Customs Service to apply for judicial consent to tap communications and open mail if there are justified allegations of illegal trade in weapons and dual-use items, including plans for such trade. Taps are now only allowed when a judge rules that there is evidence that a violation has occurred. The Lower House had already passed the proposed law, and the matter is under discussion in a committee of both Houses. (*NuclearFuel*, April 29; *The New York Times*, June 9).
- In a speech to his country's National Defence College, on 6 June, the Prime Minister of **Pakistan** proposed that China, the USSR and the USA should sponsor a meeting on nuclear non-proliferation in South Asia, with a view to establishing a nuclear-weapon-free zone there. Parts of the Pakistani press condemn the proposal as a concession to the US. An Indian spokesman has rejected it as 'a propaganda exercise'. A group of officials headed by the Chairman of the Pakistani Senate visited Washington in mid-June. Besides discussing the new proposal with the US Administration, the visit is thought to have been intended to convince Congress to lift present restrictions under the 'Pressler Amendment' on exports to Pakistan. Rather than doing so, Congress has extended them to India; but the President is expected to veto this. France has reportedly asked Pakistan to join the NPT as a condition of the sale of a 900-MWe power station (*Nucleonics Week*, June 6 & 27; *The New York Times*, June 7 & 8; *Defense News*, June 17; the *Toronto Star*, 25 June).
- **South Africa** announced on 27 June that it would accede to the NPT. It has repeated that it supports 'the idea of a nuclear weapons-free zone in [that] region' and 'would ... like to see this concept extended to the entire continent of Africa ...'. **Tanzania** and **Zambia** have acceded to the Treaty. (*Cape Times* 20 March, in *JPRS-TND-91-006*, 23 April; *The New York Times*, June 28).

c. Nuclear Trade and International Cooperation

- **Argentina** will receive credits from **Germany** to complete the Atucha-2 facility and to upgrade its electric power system, including Atucha-1 (EFE [Madrid], 10 April, in *JPRS-TND-91-006*, 23 April).
- **Argentina** and **Brazil** are forming a consortium for the production of fuel elements to be exported, inter alia, to **Germany** (*O Globo* [Rio de Janeiro], 3 April, in *JPRS-TND-91-006*, 23 April).
- **Bulgaria** has cancelled its agreement with the **USSR** under which Soviet experts helped bring the sixth unit of the Kozloduy power plant on line. The reason is said to be financial (*Duma* [Sofia], 20 March, in *JPRS-TND-91-006*, 23 April).
- The two VVER-440 reactors under construction in **Cuba** may get instrumentation and control systems from **Germany**. American sources expect delays in the completion of the reactors, following the withdrawal of Soviet support. The USA has urged Asian and Latin American states to practice restraint in supplying Cuba with nuclear technology, but is said to encourage European countries with advanced nuclear safety programmes to help

- Cuba improve the safety of its Soviet-supplied power reactors, which is a matter of great concern. The Departments of Defense and Energy, as well as some members of the US Congress would reportedly prefer construction to stop altogether (**Nucleonics Week**, May 16 & June 13).
- At the 24th annual conference of the Japan Atomic Industrial Forum, in Tokyo, the Deputy Minister of Economy of **Czechoslovakia** called for Western assistance in various segments of its nuclear power programme, including the upgrading of its Soviet-supplied reactors. Five Western nuclear constructors have made bids to build a two-unit nuclear power station in Czechoslovakia (**Nucleonics Week**, April 11 & June 6).
 - **Hungary** will continue to send the spent fuel from its VVER-440 power reactors to the **USSR** and will obtain fresh fuel from that country, against payment in hard currency. Electricité de **France** has made a bid for the construction of two 960-MW PWRs at Paks (**NuclearFuel**, April 1; **Nucleonics Week**, June 6).
 - **India** has offered to reprocess foreign nuclear fuel on a commercial basis, under IAEA safeguards. It needs to earn hard currency and hopes also to provide other countries with research reactors, consultancy services and nuclear technologies like isotope production that are not sensitive from the point of view of proliferation. No orders have been received yet, but talks are said to be under way with **Egypt**, **Syria** and some others (**NuclearFuel**, May 27).
 - Negotiations between **India** and the **USSR** on the supply of two Soviet VVER-1000 power reactors have reached the point where work on the detailed project report and site infrastructure can start. Construction should start in 1992 and the station should be completed in 1999 (**Nucleonics Week**, April 4).
 - Under the auspices of the World Association of Nuclear Operators, utility companies in **Belgium**, **Denmark**, **France**, **Germany**, **Italy**, **Spain**, and the **United Kingdom** are working on a programme to help the **European Community** administer funds earmarked for the safety-related upgrades of about 30 VVER-440 power reactors supplied by the **USSR** to countries in **Eastern Europe**. The aim is to help the EC Commission assign priorities of upgrades, based on work done in the IAEA; it does not include actual backfitting. **France** and **Germany** are creating a joint venture, open to other European parties, to help improve the safety of nuclear reactors in Eastern Europe; the work will be coordinated with the IAEA and the OECD (**Nucleonics Week**, April 4 & June 6).
 - **Japan** may have the plutonium that is separated from its spent fuel in **France** and the **United Kingdom**, fabricated in Europe into mixed-oxide fuel, in hopes that if it ships the plutonium back in MOX fuel rather than in separated form, the **United States** may ease its requirements for security measures during shipment. US sources consider this unlikely, however. Negotiations on the matter are expected to start this summer (**NuclearFuel**, April 1).
 - There have been consultations between the **Republic of Korea** and the **USSR** on cooperation in the peaceful uses of nuclear energy, including waste disposal and the joint development of small-size power reactors (**Yonhap** [Seoul], 25 & 28 March and **Choson Libo** [Seoul], 11 April, all in **JPRS-TND-91-006**, 23 April).
 - At the annual conference of the Japan Atomic Industrial Forum, the **USSR** announced that it was actively marketing comprehensive nuclear fuel cycle services to other countries, including **Japan**. It says it is ready to export 5,000 metric tons of refined natural uranium over the next five years. There are four enrichment plants operating in the **USSR**, capable of bringing the country's enrichment capacity to 10-million SWU by the mid-1990s. The **USSR** has an excess of highly-enriched uranium from dismantled intermediate-range nuclear weapons; production of highly-enriched uranium for weapons use ceased in 1987 (**Nucleonics Week**, April 11; **Defense News**, 15 April; **NuclearFuel**, April 15 & 29).
 - The **USA's** Nuclear Regulatory Commission has held up the re-export to the **USSR** of the latter's *Topaz-2* reactor as an illegal export of nuclear technology. The reactor, meant to be used in satellites, had been exhibited at a symposium in Washington; an American research group working on space defense questions plans to buy one to help it develop a similar system. The US Departments of State and Commerce are now trying to persuade NRC to let the exhibit return (**Bulletin of the Atomic Scientists**, Vol. 47, No. 5, June).
 - Early in 1991 officials from **Uruguay** and **Canada** held discussions in Montevideo about the construction of a 600-MWe Candu-type power reactor in northern Uruguay, near its borders with **Argentina** and **Brazil**. The excess power produced would be exported to those states in the framework of an agreement concluded with them and Paraguay for a regional common market, to take effect in 1995. The plan is expected to face opposition within the country and even within the present government. Uruguay's only nuclear facility, a 10-kW research reactor, became defective and was forced to shut down in 1985 (**Nucleonics Week**, April 18).

d. IAEA Developments

- On 3 April 1991 the United Nations Security Council adopted Resolution 687, setting terms for a permanent cease-fire in the Persian Gulf war. The resolution aims *inter alia* at divesting Iraq of all weapons of mass destruction and of the means to produce such weapons. The part dealing with nuclear matters obliges Iraq to refrain from acquiring or developing nuclear weapons or nuclear-weapons-usable material or any related 'subsystems or components or any research, development, support or manufacturing facilities'; to inform the UN and the IAEA of any such items, their location, amounts and type; and to put any such material under the 'exclusive control, for custody and removal', of the IAEA. It further provides for 'the destruction, removal or rendering harmless as appropriate' of the items specified and asks the IAEA to develop a plan for taking custody of the weapons-grade nuclear material and for the destruction of weapons-related facilities and equipment. Finally, the Agency is entrusted with the task of developing, 'within 120 days of adoption of the resolution and taking into account the rights and obligations of Iraq' under the NPT, a plan for the future ongoing monitoring and verification of Iraq's compliance with its obligations under the resolution.

On 6 April 1991, the Minister for Foreign Affairs of Iraq wrote to the UN Secretary-General and the President of the Security Council, accepting the resolution. In a letter of 18 April 1991, he declared that Iraq did not possess any materials which may be used in nuclear weapons, nor any of the other items listed in resolution 687. A letter to the IAEA, dated 27 April 1991, however, contained an itemized list of nuclear material and facilities which indicated types and

quantities of the material but withheld precise information on locations to which some of the material had been shifted. Press comments note that the IAEA had previously said that Iraq possessed less than one 'significant quantity' of highly-enriched uranium (i.e. 25 kg) but the information given by Iraq is that it had just under 33 kg. This has led to the comment that the IAEA should have applied a greater inspection frequency than the two visits it made annually and that the significant quantity determining the frequency of inspection of highly-enriched uranium should be lowered.

The IAEA has set up an Action Team to give effect to its tasks under resolution 687. The first inspection was made on 14-22 May by a 34-member team, at Al-Tuwaita and locations in the vicinity to which nuclear material had been moved or where other material was stored; a short-notice inspection was also made at a site said to be used for research on uranium enrichment. All declared nuclear material was found to be present. The presumed research installation, near Tarmaiya, appeared still to be unfinished; its intended use was not revealed but there were indications that equipment had recently been removed. Subsequently, an Iraqi engineer defecting to US forces reported the presence of several secret installations where work was being done on the production of weapons-usable nuclear material, including one using 25 calutrons to enrich uranium by electro-magnetic isotope separation. Shortly afterwards, the United States briefed the Security Council on evidence that Iraq was concealing uranium-enriching equipment, including calutrons, which it had removed just before the pertinent sites were inspected. A special UN/IAEA inspection team was sent to investigate several sites but barred from entry; it traced a convoy of heavy equipment from Tuwaita to a military site at El Fallujah, but Iraqi officials did not allow it to ascertain whether this included the suspected equipment and attempts to take photographs of the convoy's hasty departure were met with rifle fire. Following calls from the Security Council on Iraq to allow the access necessary for the implementation of Resolution 687, the Chairman of the Special Commission, Amb. Rolf Ekéus, the Director General of the IAEA, Dr. Hans Blix, and UN Under-Secretary-General Yasushi Akashi went to Baghdad to obtain inspection entry to locations where enrichment equipment was presumed to be; their report to the UN Secretary-General (made after the period covered by this *Newsbrief*) indicated insufficient cooperation on Iraq's part. President Saddam Hussein has since promised full cooperation. The United States Administration has said that it may use its option of renewed military intervention, if Iraq does not provide the obligatory access under Resolution 687.

There is speculation about the amounts of weapons-usable material Iraq might have produced clandestinely. Reports that it has produced up to 40 kg (88 lbs) of highly-enriched uranium have met with scepticism, given the negative US' experience with electro-magnetic (calutron) enrichment during World War II, when it was uneconomical, slow and labour-intensive and required much electric power. In consequence, the technology was declassified and the equipment involved is not among the items that call for safeguards pursuant to Art. III.2 of the NPT and is not subject to export restrictions. Thus, sales to Iraq of the components used in calutron technology (much of it supplied by the Hipotronics Company of Brewster, N.Y.) would not have drawn special attention. There is some question, however, why such indications as the electro-magnetic traces, the signs of high energy consumption and the thermal signals which a facility of this kind would generate were not noted in satellite surveillance; observers note that this might indicate progress

was modest (*Nucleonics Week*, April 11, 18 & 25; May 2 & 9, June 13, 20 & 27 & July 4; *NuclearFuel*, May 13 & June 24; *New York Times*, March 27, April 2, 3, 8, 20, 28 & 30, May 9 and June 15, 26, 27, 28, 29 & 30 & July 1 & 3; the *International Herald Tribune*, May 29 & June 28; *The Washington Times*, June 12; ABC-TV 'Nightline', 12 June; *Nuclear Control Institute 'Advisory'*, Washington, D.C., June 18; *IAEA Press Releases*, PR 91/10, 23 May, and PR 91/14, 18 June; *NRC/Handelsblad* [Netherlands], 26 & 27 June; *de Volkskrant* [Netherlands] 28 June; *Press Release of the Nuclear Control Institute* [Washington] July 1; *Lakeville Journal* [Connecticut/New York], July 3).

e. Peaceful Nuclear Developments

- Prospects for the construction of new nuclear power plants in the eastern part of Germany are seen as 'virtually zero'; the interest of industry in replacing the Soviet-designed VVER-440 reactors at Greifswald and Stendhal seems to be lessening. Greifswald still contains a large quantity of spent fuel which the USSR was obliged to take back under the original agreement. It has not done so since 1985, however. The agreement has lapsed in consequence of Germany's unification and new terms must be negotiated, pending which the fuel will remain at the site. Popular resistance to nuclear energy and the failure of the Bonn government to formulate a clear energy policy raise doubts about the future of the once-ambitious German nuclear effort (*Nucleonics Week*, May 23 & June 6; *NuclearFuel*, June 10).
- Israel's Energy Minister has said in Parliament that the construction of a nuclear power plant is being considered. The Director of the Atomic Energy Commission says that over the next ten years five new 600-MW power plants are needed, at least three of them nuclear. A report that Israel was holding talks with the USSR about the supply of a 500-MW nuclear desalination plant was officially denied (*Davar* [Tel Aviv] and *Jerusalem Radio*, both 26 April, in *JPRS-TND-91-008*, 31 May; *Nucleonics Week*, May 9 & 23).
- In Japan the prototype fast-breeder reactor *Monju* started test operations on 18 May 1991. The sodium-moderated and cooled facility should reach criticality in October 1992; it is capable of generating 280 MWe. Construction of the reprocessing plant at Rokkasho is expected to be delayed until December 1992, due to lengthy government reviews (*Nucleonics Week*, May 23; *NuclearFuel*, June 10).
- Spain will not commission any nuclear plants before the year 2000 and any growth in power demand will be met by natural gas. It is expected that the Government will decide to abandon the five mothballed nuclear power plants (*Nucleonics Week*, May 9).
- In 1980 the Parliament of Sweden decided that nuclear power would be phased out by 2010, beginning in 1995. In January 1991, following a strong lobbying effort by industry and trade unions, stressing the good performance of Sweden's nuclear stations, the large cost of decommissioning and growing public support for nuclear power, Parliament decided to defer the phasing-out. In June 1991 it accepted a Government proposal for an energy policy under which funds would be provided for the development of environmentally acceptable energy sources and conservation measures. If this should lead to technologies that could replace nuclear energy without causing national economic hardship, planning for phasing out nuclear power would

begin; if not, nuclear power would be maintained (*IAEA Bulletin*, Vol. 33, No.1; *Nucleonics Week*, April 11 & May 23; *ENS NucNet* [Nuclear News Network of the European Nuclear Society], No. 140, 12 June).

- In the **USSR**, the fifth anniversary of the Chernobyl disaster, on 26 April, has focused attention once again on the cause and the effects of that event and on the way it was handled. Western press reports speak of operator error, faulty design, inadequate safety and an irresponsible operating experiment combining to cause a supposedly impossible accident; superiors not being promptly or fully informed and their unwillingness or inability to take responsibility once the news reached them; badly organized safety measures, panic and bungled evacuations; cover-ups; and gross negligence in the clean-up resulting in widespread exposure of the population to radioactive contamination. The Ministry of Nuclear Power and Industry has been working on a new report on the causes of the accident, revising the report of 1986. Assessments of the effect of the accident on the population range from the view that these are barely measurable, to the assertion that these are catastrophic.

In early 1990, an international project, coordinated by the IAEA, was set up to evaluate the radiological consequences of the accident for human health and the environment. The project involved 200 experts from 24 states and seven international organizations; its findings were reviewed by an international committee led by Dr. Isuzo Shigematsu, Director of the Radiation Effects Research Foundation of Hiroshima and presented at IAEA headquarters on 21 May. The study concludes that the radiological effects have been less than feared, that reports of widespread illness caused by radiation could not be substantiated and that many of the people examined, who feared they had an illness due to radiation, were suffering from stress and anxiety 'wholly disproportionate to the biological significance of the radioactive contamination'. The report is denounced by environmental groups as a whitewash serving the interests of the nuclear industry and showing gross negligence and technical incompetence by the IAEA; one criticism is that the experts did not study the effects on people living within a 20-mile zone around the reactor or on workers brought in for the clean-up. Local authorities have also expressed doubts of its validity (*IAEA Press Releases* PR 91/7, 23 April and 91/9, 21 May; *The New York Times*, April 23; *The Economist*, April 27; *The Washington Post National Weekly Edition*, May 6-12; *The Independent*, 23 May; *The International Herald Tribune*, May 23; *Nucleonics Week*, April 18 & 25 & May 9, 16, 23 & 30 & June 27).

- In the **USSR**, the use, in 1976, of nuclear explosives to dig a canal between two rivers, as part of a project to create a transcontinental waterway, is claimed to have left a radioactive lake of 400 by 600 metres in the district of Perm in the Northern Urals. Other reports speak of peaceful nuclear explosions (PNEs) that had useful results, *inter alia* in the oil and gas industry. Attempts to use PNEs to irrigate arid land by reversing the flow of rivers were stopped in the face of environmental opposition, and the Soviet PNE programme was terminated in 1988 (*Nucleonics Week*, May 9).
- In the **United States**, a fire in a transformer has caused a brief shut-down of the Maine Yankee 830-MWe power plant. The Nuclear Regulatory Commission has given provisional permission for the restart of the 1,100 MWe Unit-2 of Tennessee Valley Authority's Browns Ferry Plant in Alabama, which was shut down for repairs, redesign and

changes in plant management, after a fire in 1975. It is hoped that Unit-3 can be restarted in 1994, and Unit-1 some time before the end of the decade. The NRC has approved a rule under which operators of power reactors with 40-year operating licences that are expiring may apply for renewals for up to 20 years. The Union of Concerned Scientists, basing itself on calculations made by NRC staff, contends that a weld in the reactor vessel of the 31-year old 175-MWe Yankee Rowe power reactor has become so brittle that it is in danger of cracking. The UCS claims that the reactor is operating in violation of NRC requirements and it has petitioned the NRC for its immediate shut-down. The petition has been denied on the ground that the reactor is safe to run for at least another year; the NRC has promised a fuller reply in the future. After UCS announced it would file an appeal in Federal Court, press reports have indicated that the NRC may only extend the plant's operating licence to February 1992. In a move towards permanent closure of the Shoreham nuclear power station the NRC has amended the licence of the utility owning the station so that it may no longer operate it. (*The New York Times*, May 2, May 3 & June 5, 13 & 28; *Nucleonics Week*, June 6 & 27 & July 4; *The Washington Post*, June 13).

- With approximately 575 nuclear-powered military vessels in service worldwide, the development of nuclear merchant ships is continuing. Starting in 1959 with the *Lenin*, the **USSR** has successfully operated nuclear-powered icebreakers, of which it has since completed six more; two further ones are near completion. The **USA's** nuclear cargo ship *Savannah* (1962) and **Germany's** *Otto Hahn* (1970s) are no longer in service, mainly due to complications in obtaining berthing rights in foreign ports. **Japan's** *Mutsu*, also launched in the 1970s, is now making a series of experimental trips. Since 1988 the **USSR** has operated a commercial carrier, *Sevmorput*, capable of navigating through thick ice. If she turns out to be economical to run, a sister ship may be built (*IAEA Bulletin*, Vol. 33, No.1).

f. Developments of Concern for Vertical Proliferation

- The nuclear-weapon production complex in the **United States** remains the object of press attention. Reports about large quantities of liquid waste discharged or leaked, and of solid waste buried, at the Hanford nuclear reservation near Richland, Washington, are under investigation by the Environmental Protection Agency. It is now known that when tank space was short in the 1950s, waste meant to be stored there was often released into the soil, sometimes without records of quantity or composition; the extent of contamination and the size of the clean-up job are therefore hard to assess. Plans to vitrify high-level waste are held up by delays in development (*Nucleonics Week*, May 2; *Bulletin of the Atomic Scientists*, Vol. 47, No.4, May).

Reconstruction of the 1960s Rocky Flats plutonium-processing plant, closed in 1989 for safety reasons, has been speeded up. The work is to be completed in 1993 and will cost \$1.1-billion. While the plant should then be able to operate for ten more years, until a new facility is built in a less populated area, it is possible that a legal limit on the amount of the radioactive waste stored there will force a shutdown within nine months after full operation is resumed. There are questions in Congress, whether the facility, where plutonium cores for nuclear weapons are fabricated, is needed at all, given the thaw in US-Soviet relations. Also, a new approach to weapons design, involving the re-use of retired plutonium pits, could make the plant obsolete. Defence officials are

quoted as saying, however, that testing of the new process would take too long, that present US weapons need urgent modernization and that new warheads for use in several missile systems are needed right away (**The Washington Post National Weekly**, May 20-26; **Bulletin of the Atomic Scientists**, Vol. 47, No.4, May).

It is now expected that one reactor used for the production of tritium at Savannah River, idled in 1988 by problems of safety and bad management, may be restarted in the summer of 1991 – the other two seem no longer needed. Companies running the facility under contract have been accused of financial irregularities, of which the full extent is not yet known. Criminal investigations have begun. Congressional criticism of the growing cost (\$2.6-billion so far) of repair and modernization is answered by the Energy Department with the argument that some tritium may indeed be recovered from retired warheads, but it is not known how long the old reactor can remain in operation or how fast a new one can be built. A decision as to the type of the new reactor and its siting is expected this year; estimates of its cost range from \$4-billion to \$5.6-billion (**The New York Times**, April 14 & 19 & May 7 & 9; **The Washington Post National Weekly Edition**, April 15-21; **Nucleonics Week**, May 9 & 16).

- The USSR and the USA are reducing the number of their nuclear submarines. By 1992 the USSR will retire 45 submarines of older classes and several new ones. In the early years of the next century, the Soviet submarine fleet, which now has 183 boats, should number about 100. The US Navy had 134 submarines in 1988 and now has 122. In ten years, it is expected to number 18 ballistic missile submarines (now 32) and 65-70 attack submarines (now 90). The US are removing their permanent strategic submarine base from Holy Loch, in Scotland, although future visits are possible. On the other hand, the planned addition of four *Vanguard*-class submarines, carrying Trident II D5 missiles, to the UK Royal Navy will result in a large increase of that country's nuclear arsenal by the end of the century. Budgetary constraints and the lessening of tension between the Superpowers have ended the 24-hour airborne communications link between the US President and nuclear-armed submarines; the fifteen antenna-trailing airplanes that used to be in the air full-time will now make random flights and be on 'interim ground alert'. The EC-135 command-post aircraft of the US Strategic Air Command were removed from continuous air alert in July 1990 and SAC is studying the possibility of reducing or eliminating ground alert for its bombers, of which 30% are still on around-the-clock alert (**International Defense Review**, 4/1991; **The Bulletin of the Atomic Scientists**, Vol. 47, No.4, May, & No. 5, June; **Defense News**, May 13; **The New York Times**, May 26).
 - The United States Defense Department is developing a nuclear-powered rocket for use in its space defence programme. According to a report of the Federation of American Scientists, confirmed in internal Government documents, the project involves the development of a new reactor type to power large rockets capable of lifting a 70-ton payload (**The New York Times**, April 3; **The Washington Post National Weekly Edition**, April 29-May 5).
 - A study by International Physicians for the Prevention of Nuclear War concludes that underground nuclear testing by all five nuclear-weapon states leaves large amounts of long-lived radionuclides that may pose a serious long-term environmental threat. The US Department of Energy has denied that underground testing poses a danger to human health (**News Release from the International Commission of Physicians and Environmentalists to Investigate the Health and Environmental Consequences of Nuclear Weapons Production**, May 16; **The New York Times**, May 17).
- g. Developments of Concern for Horizontal Proliferation**
- **Algeria** is receiving assistance from **China** in the construction of a research reactor near Ain-Oussera, south of Algiers. In the absence of official information, initial estimates of its power, based partly on the size of the cooling towers, had put it at about 40-MW; the secrecy surrounding construction, the unusually heavy security around the site and the presence of several missile emplacements nearby added to concern that the facility might be intended primarily for plutonium production. More recent reports speak of a 10-MW reactor, fuelled with low-enriched uranium and heavy-water cooled. The Algerian Prime Minister has stated that his Government has never made a secret of its cooperation with China in the creation of the research centre, that the reactor is meant for peaceful purposes and that it will be submitted to IAEA safeguards on completion ('A Chronology of Algerian Nuclear Developments' in **Bulletin of the Emerging Nuclear Suppliers Project**, April 16; **The Washington Post**, April 20; **Time**, April 22; **Nucleonics Week**, April 18, May 2 & 23; **Trust & Verify**, No. 20, June).
 - According to US sources **China** gave **Pakistan** the design of a tested nuclear weapon, enough weapon-grade uranium to build two weapons, and tritium to boost their yield. It is also alleged to have sold **India** 130 tons of heavy water. China is said to be supplying modern ballistic missiles to **Pakistan** and **Syria**; those for Pakistan are supposedly nuclear-capable. The US Secretary of State has warned that this deal could have 'profound consequences for Chinese-American relations'. China has denied exporting medium-range missiles to Pakistan (**The Washington Post**, April 20 & May 12 [Gary Milhollin and Gerard White]; **Time**, April 22; **Zhongguo Xinwen She** [Beijing], 25 April, in **JPRS-TND-91-007**, 20 May; **The New York Times**, May 13 [Milhollin and White] & June 10 & 13).
 - Anxiety about the nature of the nuclear programme of the **Democratic People's Republic of Korea** continues. There is evidence of the existence of a large natural-uranium reactor (30-50-MWth) at Yongbyon, capable of producing significant quantities of plutonium; a reprocessing plant is said to be under construction. The effect of attempts by Japan and the USSR, to persuade North Korea to drop its conditions for the signature of a safeguards agreement are not yet clear, and while suggestions in the Republic of Korea for a preemptive strike on the facility were formally retracted, prospects of a possible nuclear arms race between North and South are a cause of anxiety (**Choson Ilbo** [Seoul], 1 April, in **JPRS-TND-91-006**, 23 April; **New York Times**, April 7 & 16, May 26 & June 14; **The Economist**, April 20th; 'A Chronology of North Korean Nuclear Developments' in **Bulletin of the Emerging Nuclear Suppliers Project**, May 13).
 - US sources continue to suspect **Iran** of having a nuclear-weapons programme. It is known to have an agreement with **Pakistan** and reportedly has secret nuclear-cooperation agreements with **China**, which is said to provide reactor technology, and with **South Africa**, which allegedly has supplied it with uranium concentrate. Although apparently not convinced by the allegation, **Germany** has not acceded

to a renewed request from Iran to help it complete the Bushehr nuclear power plant, which was seriously damaged in the war with Iraq and has since deteriorated so much that it may not be worthwhile to resume its construction (*Nucleonics Week*, May 2).

II. PPNN ACTIVITIES

- The PPNN Core Group in its new composition [see Newsbrief 13] held its ninth semi-annual meeting at the Old Government House Hotel, Guernsey, British Channel Islands, from 18-20 May. This was the inaugural meeting of the second phase of the Programme. Except for Olu Adeniji and Lawrence Scheinmann, all members were present. Roland Smith [UK] also attended as a paper presenter.

The substantive discussions were divided into the four traditional categories: reports on current developments and situations; NPT issues; functional questions; and issues connected with a specific country or region. Under current developments, the Group examined the provision by China of a research reactor in Algeria; negotiations between Argentina, Brazil and the IAEA on a safeguards agreement; attempts to persuade North Korea to sign its NPT safeguards agreement; the civil nuclear power position in Eastern Europe; the current position over global uranium supply and over Japanese reprocessing; changes in German export legislation and possible changes in IAEA safeguards.

Under NPT issues, David Fischer introduced papers by himself and by George Bunn and Charles van Doren [2CGP 1&2] on the negotiating history of Article 10.2 of the NPT and its implications for 1995, especially the options available for extending the NPT. Adolfo Taylhardat then presented a report on the PTBT Amendment Conference of January 1991. This had been overshadowed by the Persian Gulf crisis, and its outcome had been indeterminate.

Under functional questions, the Group discussed the Hague meeting of the Nuclear Suppliers Group in March, on the basis of a presentation by Roland Smith, Head of the Non-Proliferation and Defence Department of the UK Foreign and Commonwealth Office. The discussion also covered other developments in the area of supplier controls.

Finally, the Group discussed two regional issues; the Feasibility of a Nuclear-Weapon-Free Zone in Africa and Nuclear Non-proliferation and the USSR. David Fischer introduced a paper on the first of these issues [2CGP 3]; Roland Timerbaev made a presentation on the second.

- The next meeting of the PPNN Core Group will take place at Princeton University, US, over the weekend 8-10 November 1991. The main item for substantive discussion will be the relationship between a comprehensive nuclear test ban and nuclear non-proliferation.
- The content of PPNN Newsbriefs is now available as a separate data collection within the Emerging Nuclear Suppliers Project Database. This may be accessed on-line. Contact: Roger Haney, ENSP, Monterey Institute of International Studies, 425 Van Buren Street, Monterey, CA. 93940 (Tel. (408) 647-3515; Fax (408) 647-4199).
- On 25 April Ben Sanders spoke at a forum held at UN Headquarters by the NGO Committee on Disarmament, on prospects for a nuclear-weapon-free zone in the Middle East;

on 29 April he took part in a meeting in Washington of the Council for a Livable World Education Fund, on US nuclear non-proliferation legislation; on 4 and 5 May he lectured at a non-proliferation seminar for journalists held at the University of Maryland, College Park, by the New York University Center for War, Peace and the News Media. After chairing the ninth meeting of the Core Group in Guernsey, on 18-20 May, together with John Simpson he participated in the third meeting of the Advisory Group for the Civil Plutonium in Europe project at the Science Policy Research Unit of the University of Sussex, on 22-24 May. On 13 June he participated in a session at UN Headquarters of the Steering Committee of the IAUP/UN Commission to advance the teaching of arms control issues; later that day he took part in discussions of the Washington Council on Non-Proliferation with a delegation from Pakistan, on a nuclear-weapon-free zone in South Asia. On 20 June he presented a paper at a workshop on technology for arms control verification at Ryerson Polytechnical Institute in Toronto, Canada.

- John Simpson presented a paper to the second UN Conference on Disarmament Issues held at Kyoto, Japan, on 27-30 May. He took the opportunity to consult with members of the Japanese Foreign Ministry and the Japanese Atomic Industrial Forum, in Tokyo, on non-proliferation issues. He went on to Malente, Germany, to present a paper on British nuclear and non-proliferation policy to the annual workshop on European Nuclear Non-Proliferation Policies on 2-5 June, organised by Harald Müller of the Peace Research Institute, Frankfurt. On June 18-22 he visited Ottawa to present a paper to a conference on 'Supply Side Control of Arms Proliferation' organised by the Canadian Institute for International Peace and Security. On June 26 he took part in a briefing in Warsaw organised by Harald Müller for members of the Polish Foreign Ministry and the Institute for International Affairs on developments in nuclear non-proliferation.

III. Other Non-Governmental Groups Active in Related Areas

- The **UK National Nuclear Non-Proliferation Study Group**, held its seventh meeting on 28th June 1991. Among subjects discussed were controls over world stocks and flows of plutonium; the origins of nuclear supplier controls and recent developments in this area; and the impact of the Gulf war upon the Nuclear Non-Proliferation regime.
- The **Henry L. Stimson Center** (Washington, DC), with funding from the W. Alton Jones Foundation, has begun a project exploring whether and how confidence-building measures that helped to defuse the East-West conflict can be adapted to ease tensions in other regions of the world, and to facilitate non-proliferation efforts. For more information contact the Stimson Center, 1350 Connecticut Avenue, NW, Suite 304, Washington, DC 20036 tel: (202) 223-5956, fax: (202) 785-9034.

IV. Some recent books, articles and other materials on Nuclear Non-Proliferation

- Books:

Anthony H. Cordesman, **Weapons of Mass Destruction in the Middle East**, (London: Brassey's for the Royal United Services Institute, 1991).

Derek Paul, Hanna Newcombe, Betty Truman and Jennie Hatfield-Lyon, Eds.: **Disarmament's Missing Dimension: A**

UN Agency to Administer Multilateral Treaties, Canadian Papers in Peace Studies 1990 No. 1, Markland Policy Group, Science for Peace/Samuel Stevens, Toronto 1990, 150 pp.

Radioactive Heaven and Earth: The Health and Environmental Effects of Nuclear Weapons Testing in, on, and above the Earth; a Report of the International Physicians for the Prevention of Nuclear War and the Institute for Energy and Environmental Research (New York: The Apex Press, May 1991, 180 pp.

- Articles and Other Materials:

George N. Barrie, 'The nuclear non-proliferation treaty on the eve of the fourth review conference', *Tydskrif vir die Suid-Afrikaanse Reg* (Journal of South African Law), Rand Afrikaans University, Johannesburg, 1991-1

Thomas B. Cochran and Robert S. Norris, 'A First Look at the Soviet Bomb Complex', *Bulletin of the Atomic Scientists*, Vol. 47, No. 4, May 1991

Jacques de la Ferté, 'Opportunities and Challenges of Nuclear Energy in Central and Eastern Europe', *NEA Newsletter*, Vol. 9, No. 1, Spring 1991

Richard Fildhouse, 'China's Mixed Signals on Nuclear Weapons', *Bulletin of the Atomic Scientists*, Vol. 47, No. 4, May 1991

David Fischer and Harald Mueller, 'The Fourth Review of the Non-Proliferation Treaty, in *SIPRI Yearbook 1991*, (Oxford: Oxford University Press for SIPRI, 1991).

James Leonard, 'Steps Toward a Middle East Free of Nuclear Weapons', *Arms Control Today*, Vol. 21, No. 3, April 1991

Andrew Mack, 'North Korea and The Bomb', *Foreign Policy*, No 83, Summer 1991.

David C. Morrison, 'Loose Soviet Nukes: A mountain or a Molehill?', *Arms Control Today*, Vol. 21, No. 3, April 1991

M. Plugge, 'The Iraqi Connection', *International Defense Review*, No. 6, 1991.

Dhirendra Sharma, 'India's Lopsided Science', *Bulletin of the Atomic Scientists*, Vol. 47, No. 4, May 1991

John Simpson, 'The 1990 Review Conference of the Nuclear Non-Proliferation Treaty. Pointer to the Future or Diplomatic Accident?', *The Round Table*, 1991, 318.

Carl-Erik Wikdahl, 'Sweden: Nuclear Power Policy and Public Opinion', *IAEA Bulletin*, Vol. 33, No. 1, 1991

- Research Papers:

Eric Chauvistre, 'Germany and Proliferation: The Nuclear Export Policy', Working Paper of the *Berghof Foundation for Conflict Research*, Berlin, 1991

Zachary S. Davis, 'Nuclear Nonproliferation Regimes: A Comparative Analysis of Policies to Control the Spread of Nu-

clear, Chemical and Biological Weapons and Missiles', Report for Congress from the *Congressional Research Service*, *The Library of Congress*, Washington, D.C., April 1, 1991.

Milton M. Hoenig, 'Eliminating Bomb-Grade Uranium from Research Reactors', paper No. 7 in a series of papers published by the *Nuclear Control Institute on Issues Bearing on Extending and Strengthening the NPT*, Washington, January 1990.

V. Comments from Readers

A letter has been received from Ms Jan Murray, Secretary-General of the Uranium Institute (and a member of PPNN's Core Group), regarding an item in the Spring issue of the *Newsbrief* (No. 13).

A reader of the item on France might be forgiven for thinking that the nuclear programme had ground to a halt altogether, whereas the order of a new and very large (1450 MWe) plant was announced in June 1990 and the commercial contracts with the main supplier, Framatome, recently confirmed. Equally, electricity exports remain substantial (12% of production in 1990). This may be less kilowatts than the previous year ... but it is a similar proportion of production. This is not to say that the nuclear programme in France is without problems; the item correctly identified some of them. But as presented, the list of problems was somewhat unbalanced.

A reaction to the item on Sweden was received from Mr. Alan P. Marks, of the Western Mining Corporation Limited, of Melbourne, Victoria, Australia. He writes:

The Liberal and Centre Parties agreed on 15 January to support legislation by the Social Democrat minority government to eliminate the 1995 starting date for phasing out two of the existing 12 nuclear power stations. While there is as yet no proposal to change the 2010 deadline for the shut-down of all twelve stations, it is becoming increasingly clear that the ability to offer alternative, economic, electric power may be attached as a condition to such a shut-down. Swedish guidelines for energy and the environment have evolved as mutually incompatible when requiring no increase in CO₂ production, no additional hydro power and the shut-down of nuclear power; the latter is likely to be called into question. The background to the latest political move is Sweden's 50 percent dependence on nuclear electricity and the realisation, by both management and workers, in the energy-intensive industries on which the economy is based, that loss of a significant slice of low-cost power could lead to unemployment, movement of industries off-shore or both. Recent public opinion polls have shown that a majority of those polled want to keep nuclear power after 2010.

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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