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Annotated Bibliographic Guide

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NUCLEAR PROLIFERATION: A SELECTIVE ANNOTATED BIBLIOGRAPHIC GUIDE

Bert Chapman

The conclusion of the Cold War's U.S.-Soviet superpower rivalry may have ended the threat of a global nuclear military confrontation involving these powers. It did not, however, result in the termination of international regional conflicts or of military threats to U.S. national security. The collapse of a world political and strategic system ostensibly polarized between two ideologically contrasting superpowers has resulted in the emergence of numerous threats to regional and global order.

One of these threats is the re-emergence and continual growth of internecine ethnic conflicts, such as those gripping the states once part of the former Soviet Union and Yugoslavia, as well as in parts of the world as diverse as Rwanda and the Middle East. Another global security threat that has gained increased importance in light of the Soviet Union's collapse, and was a contributing factor to the 1991 Persian Gulf War, is the spread of nuclear weapons and related technologies to countries in addition to the five recognized nuclear powers of the United States, Russia, Great Britain, France, and China. This phenomenon is commonly called nuclear proliferation, and it already is an important foreign policy and national security concern for the United States and other major players on the international stage.

Current and ongoing concerns over North Korean nuclear development are the most vivid examples of U.S. and international concern over nuclear proliferation. The presence of states such as North Korea, Iran, Libya, and Iraq possessing combinations of militarily

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aggressive leaders, messianic ideological doctrines, and proven records of using force against domestic and international opponents heightens international political tensions. The possibility of these respective nations and their leaders Kim Jong-Il (North Korea), Hafshemi Rafsanjani (Iran), Muammar Qaddafi (Libya), and Saddam Hussein (Iraq) possessing nuclear weapons is even more ominous in view of their demonstrated records of fomenting subversion, promoting terrorism, and military aggression.¹ The additional possibility that these or other renegade nations might distribute nuclear weapons and the requisite technologies to terrorist groups is even more disquieting.

Assessment

The Bush administration, in an outgoing assessment of this problem, presented the following analysis of the nuclear proliferation dilemma:

In the post-Cold War era, one of our most threatening national security challenges is the spread of weapons of mass destruction and the means to deliver them. As the threat of nuclear confrontation with the former Soviet Union recedes, the danger that a nuclear, chemical, or biological weapon will be launched from some other quarter by an aggressor is growing. Covert procurement networks continue their energetic global efforts to acquire the means to build these weapons. While the disintegration of the Soviet bloc has led to relaxation of the forty-year old East-West controls of the Allied Coordinating Committee for Multilateral Export Controls (COCOM), dual-use technologies with military applications are becoming increasingly available throughout world markets. Inevitably, an increasing number of supplier nations will become able to contribute to the proliferation of ballistic missiles and weapons of mass destruction.²

Additional illustration of the gravity of nuclear proliferation comes from the following assessment by a recent governmental policymaker in this area.

For a long time, the nuclear club was one of the world's most exclusive: the United States, the Soviet Union, China, France, and Britain were the only acknowledged members. Even before proliferation became a significant concern in the 1980s, there was a handful of states which probably qualified for membership in this exclusive group, most notably India, Israel, South Africa, and Pakistan. But the

neighborhood around the club is changing and more states are aspiring to membership. The spread of computers and advanced technology and the growth of scientifically trained elites is making it possible for less wealthy states to begin to develop and maintain a nuclear capability.

While states engaged in nuclear weapons research may choose to terminate their programs before they actually develop weapons, Taiwan, Iran, Algeria, and Libya are conducting such research. Argentina and Brazil went beyond research and began to develop nuclear material production facilities before their widely praised decisions to refrain from further development. Iraq actually had succeeded in producing nuclear weapons material and North Korea not only has produced it, but is probably developing nuclear weapons in which to use it. Most of the countries which are developing nuclear weapons are also developing or already have ballistic missiles. Even when sounding rockets and space launch programs are excluded, most Middle Eastern countries, North and South Korea, India and Pakistan, South Africa, Brazil and Argentina, Libya and Tunisia have or are developing ballistic missiles of varying ranges and payloads.³

The global diffusion of scientific and technological knowledge includes nuclear knowledge and expertise consequently enhancing the ability of nuclear aspirants to acquire and construct the requisite materials and technology to produce nuclear weapons.

It only takes about 15 kilograms of highly enriched uranium or 6 kilograms of plutonium to make a nuclear weapon. Just as a result of the arms control agreements already signed, by the end of the decade between 300,000 and 500,000 kilograms of uranium and 60,000 kilograms of plutonium will have been released from the arsenal of the former Soviet Union.

Building a nuclear weapon is relatively easy compared to the difficulty of refining uranium and plutonium to concentrations required to make a nuclear explosion.

The breakdown of central control in the Soviet Union and the surfeit of weapons-grade nuclear material raises the prospect that countries determined to develop nuclear weapons will not have to make their own nuclear material; they'll just buy it.⁴

Nuclear proliferation is likely to assume an increasingly important role in international political discourse and, hopefully, within the realm of public opinion. The exponential global growth of nuclear expertise and ongoing advances in communication and information technologies possess the potential to enhance public awareness and knowledge of developments in this area. These advances, though, may also contribute to an information overload and public policy analysis that restricts the possibility of effectual governmental responses to nuclear proliferation crisis situations.

There are no easy, lasting, or cost-free solutions to this predicament. The United States, its allies, and the international community must approach nuclear proliferation problems on a case-by-case basis. These problems must be dealt with in realistic and pragmatic ways without succumbing to the utopian idealism of nuclear abolitionists.

Diplomatic measures may be sufficient in one case involving a nuclear weapons-aspiring power while economic sanctions may be required with another state. Covert intelligence operations against proliferant regimes may be the requisite medicine in certain situations. Possessing reliable and effective antiballistic missile defense systems is also an important response to nuclear proliferation. In still other instances, various levels of overt military action against the offending state organization may be required ranging from surgical strikes to full-scale military operations including territorial invasion, overthrowing the offending regime, and culminating in unilateral, multilateral, or international military occupation.

The literature on nuclear proliferation is voluminous and multifaceted. Listed within the following selective bibliography are important United States government documents, United Nations publications and information sources, selected Internet resources, and books by scholars and other experts in this field. These monographic works present a diverse array of opinions and examine subjects relevant to nuclear proliferation such as United States antiproliferation policies, nuclear weapons developments in currently non-nuclear states, the projected 1995 extension of the International Non-Proliferation Treaty (NPT), international efforts to combat proliferation such as the Missile Technology Control Regime (MTCR),⁵ activities of the International Atomic Energy Agency (IAEA), and proliferation consequences of the Soviet Union's breakup and the dispersal of its nuclear weapons arsenal to successor states.

United States. General Accounting Office. *Arms Control: U.S. Efforts to Control the Transfer of Nuclear-Capable Missile Technology*. Washington, DC: GAO, 1990. SuDocs no.: GA 1.13:NSIAD-90-176. Item 0546-D. 32p.

This is an unclassified version of a General Accounting Office (GAO) report on various aspects of MTCR and the role of the United States in this organization. Topics examined in this publication include whether relevant U.S. agencies adopted specific procedures to implement MTCR, the numbers of MTCR licenses processed and their disposition, the effectiveness of interagency coordination, and the sufficiency of U.S. MTCR resources.

United States. General Accounting Office. *Ballistic Missile Defense: Evolution and Current Issues*. Washington, DC: GAO, 1993. SuDocs no.: GA 1.13:NSIAD-93-229. Item 0546-D. 84p.

One aspect of nuclear weapons proliferation is finding means of defending against ballistic missiles. This GAO report analyzes U.S. ballistic missile defense programs as embodied in the Strategic Defense Initiative (SDI).

Ballistic Missile Defense opens with a historical overview of U.S. ballistic missile defense efforts. Subsequent chapters chronicle SDI's evolution and congressional oversight, theater and national missile defense, defense and commercial technology transfer applications, the planned use of launch vehicles and nuclear reactors in space, and pertinent appendixes, documentation, tables, and figures.

United States. General Accounting Office. *Nuclear Nonproliferation and Safety: Challenges Facing the International Atomic Energy Agency*. Washington, DC: GAO, 1993. SuDocs no.: GA 1.13:NSIAD/RCED-93-284. Item 0546-D. 76p.

The International Atomic Energy Agency (IAEA) is a United Nations-affiliated agency whose organizational mandate's intent is to "administer safeguards to detect diversions of significant quantities of nuclear material from peaceful uses." (p.2) This particular report analyzes and evaluates IAEA's performance in fulfilling its institutional purpose.

Contents of this effort examine IAEA's organization and statutory mandate, the need to strengthen IAEA's safeguards program, IAEA experiencing difficulty funding its safeguards program, U.S. technical assistance being helpful despite management weaknesses, the satisfaction of IAEA-member states with its nuclear safety role, and IAEA's limited access to problem nuclear reactors.

Appendixes include listings of IAEA-member states, non-nuclear weapons states subject to IAEA inspections in 1992, IAEA Operational Safety Review Team (OSART) missions to nuclear power plants from 1983 to July 1993, and OSART technical exchange missions to nuclear power plants.

United States. General Accounting Office. *Nuclear Nonproliferation: Japan's Shipment of Plutonium Raises Concerns about Reprocessing*. Washington, DC: GAO, 1993. Washington, DC: GAO, 1993. SuDocs no.: GA 1.13:RCED-93-154. Item 0546-D. 20p.

The security of nuclear materials during transportation is particularly important due to fears that such material may be stolen by terrorist groups. In January 1993 the Japanese ship *Akatsuki Mara* and its armed escort *Shikishima* completed a two-month trip transporting 1.7 tons of plutonium oxide from Cherbourg, France, to Tokai, Japan. (p.1) This particular report examined the physical security arrangements of this shipment as well as any costs to the United States stemming from the transportation of plutonium.

Contents include assurances to U.S. officials of the shipment's physical security and safety and of the ships and equipment being used. There was U.S.-Japanese consultation on physical security standards and U.S. officials contend that there were minimal costs involved in the shipment. Japan's shipment does increase concerns over world plutonium stocks due to that element's use in nuclear weapons creation and several countries expressed concern over this shipment to Japan.

The report also mentions that commercial reprocessing increases international plutonium stocks and that U.S.-Japanese agreement on plutonium shipment sets significant precedents while limiting the opportunities for congressional oversight of such agreements. (p.11)

Nuclear Nonproliferation concludes by recommending that Congress consider the U.S.-Japanese agreement's impact terms on congressional oversight opportunities and on U.S. nonproliferation goals. (p.14)

United States. General Accounting Office. *Nuclear Regulation: Better Criteria and Data Would Help Ensure Safety of Nuclear Materials*. Washington, DC: GAO, 1993. SuDocs no.: GA 1.13:RCED-93-90. Item 0546-D. 73p.

The Nuclear Regulatory Commission (NRC) regulates the use of radioactive materials not used in electric utilities or nuclear weapons. This GAO report evaluates the quality of NRC's responsibilities and programs.

Following an executive summary, *Nuclear Regulation* begins by examining radiation sources and harmful

effects plus the regulation of nuclear materials. Subsequent chapters and appendixes stress the presence of good criteria and missing data in NRC's nuclear materials program, concerns of financial assurance by NRC concerning radioactive material cleanups, NRC inspections in individual states, categories used in state inspections, excerpts from the NRC state government inspection questionnaire, and a history of medically abnormal occurrences at federal and other nuclear facilities.

Report findings indicate that the NRC needs to establish common performance standards in its program evaluations, create specific procedures for revoking state agreements, and revoke existing agreements incompatible with recognized and accepted performance standards. (p.5)

United States. General Accounting Office. *Nuclear Safety: Progress Toward International Agreement to Improve Reactor Safety*. Washington, DC: GAO, 1993. SuDocs no.: GA 1.13:RCED-93-153. Item 0546-D. 16p.

Besides military concerns, the safety of individual nuclear power plants is an important factor to consider when examining nuclear proliferation. This report examines the IAEA's nuclear safety convention emphasizing civilian nuclear power plants. Nuclear facilities dealing with waste management, reprocessing or enrichment, research reactors, and military activities are not covered by convention terms. (p.1,3)

Report findings demonstrate that participating countries have mixed views on the convention's proper scope, most countries prefer general safety principles to internationally binding standards, and most countries oppose international enforcement or a regulatory organization monitoring nuclear plant safety. Developing a draft international safety convention has been difficult due to diverse national perceptions and expectations toward such action and due to national sovereignty concerns such an international agreement could cause. (p.7)

United States. General Accounting Office. *Nuclear Security: DOE's Progress on Reducing Its Security Clearance Workload*. Washington, DC: GAO, 1993. SuDocs no.: GA 1.13:RCED-93-183. Item 0546-D. 15p.

The security of nuclear power plants is an important issue to consider in examinations of nuclear proliferation due to the possibility of the theft of nuclear materials or sensitive information. The process of granting access to such sensitive information and material in the form of security clearances is time-consuming and expensive. This particular report examines the U.S. Department of Energy's (DOE)

security clearance program and its efforts to reduce backlogs in granting such clearances.

Report contents provide background information on DOE security clearance policies and procedures, DOE's clearance processing workload, and the satisfaction of most DOE contractors with current security clearance processing times. Findings reveal that while DOE processing time is down more progress is needed and that security cases containing unfavorable applicant information are problematic and take considerable time to resolve. (p.11-12)

United States. General Accounting Office. *Soviet Nuclear Weapons: U.S. Efforts to Help Former Soviet Republics Secure and Destroy Weapons*. Washington, DC: GAO, 1993. SuDocs no.: GA 1.5/2:T-NSIAD-93-5. Item 0546-D-01.

This is a statement made to Congress by Joseph E. Kelley, the director of GAO's National Security and Foreign Affairs Division, on U.S. efforts to assist Russian nuclear weapons dismantling efforts.

Kelley mentioned that the Defense Department had been given \$303 million to support the safety and security of the Russian nuclear arsenal and that the United States had considered options for disposing of Russian plutonium and selling and using highly enriched Russian uranium. One problem in these efforts, according to Kelley, was Russian refusal to permit direct U.S. involvement in the nuclear dismantling process.

United States Congress. House Committee on Armed Services. *Shaping Nuclear Policy for the 1990's: A Compendium of Views-Report of the Defense Policy Panel*. Washington, DC: GPO, 1993. SuDocs no.: Y 4.AR 5/2:N 88/5. Item 1012-A. ISBN 0-16-040067-8. 632p.

This document contains responses to a 1992 paper by former House Armed Services Committee Chair and Secretary of Defense Les Aspin entitled "From Deterrence to DeNuking: A New Nuclear Policy for the 1990's," which examines possible U.S. nuclear policy options.

Responses and comments to Aspin's paper are provided by a variety of current and former government officials, scholars, and corporate representatives, including former U.S. Ambassador to West Germany Richard Burt, Librarian of Congress James Billington, Fred Ikle of the Center for Strategic and International Studies, Representative Dave McCurdy (D-OK), Joseph S. Nye, Jr., of Harvard University, and other influential U.S. national security policy figures.

United States Congress. House Committee on Banking, Finance, and Urban Affairs. *H.R. 4803, The Nonprolif-*

eration of Weapons of Mass Destruction and Regulatory Improvement Act of 1992. Washington, DC: GPO, 1992. SuDocs no.: Y 4.B 22/1:102-121. Item 1013-A. ISBN 0-16-039830-4. 330p.

This is an 8 May 1992 hearing on bill H.R. 4803 introduced by Banking Committee Chair Henry Gonzalez (D-TX). The purpose of this bill is to deny funding to the International Monetary Fund (IMF), World Bank, and other international multilateral development institutions until they end the membership of countries not adhering to international nonproliferation regimes and prohibit the U.S. Export-Import Bank from financial assistance to countries failing to adhere to nonproliferation requirements. (p.1)

Witnesses testifying at this hearing include Kathleen Bailey of the National Institute for Public Policy, U.S. Department of Defense Deputy Assistant Secretary for International Security Affairs Carl Ford, Central Intelligence Agency (CIA) Director Robert Gates, CIA Non-Proliferation Center Director Gordon Oehler, Federal Reserve Board Supervision and Regulatory Committee leader John LaWare, Wisconsin Project on Nuclear Arms Control Director Gary Milhollin, Treasury Department Deputy Assistant Secretary for International Monetary Affairs Barry Newman, and the State Department's Deputy Assistant Secretary for Politico-Military Affairs William Rope.

Supplemental material submitted into the transcript includes an update on 1990 conventional arms transfers, charts on IMF and World Bank loans from member countries, written questions submitted to witnesses by committee members, and a 1990 cable from the State Department to U.S. embassies informing them of the active role they are to play in supporting U.S. defense trade.

United States Congress. House Committee on Foreign Affairs. *Iraq's Nuclear Weapons Capability and IAEA Inspections in Iraq*. Washington, DC: GPO, 1993. SuDocs no.: Y 4.F 76/1:IR 1/13. Item 1017-B. ISBN 0-16-041691-4. 206p.

Concern over Iraqi development of a nuclear weapons capability was one of the factors prompting the initiation of Operation Desert Storm. This hearing examines the postwar status of Iraq's nuclear program as well as the role of the United Nations and IAEA in inspecting Iraqi nuclear capabilities.

The principal witness is Robert Galluci, the State Department's assistant secretary for politico-military affairs. Other witnesses include Gary Milhollin; Jules Kroll of Kroll Associates; Jay C. Davis, the director of the Lawrence Livermore National Laboratory's Center for Accelerator Mass Spectrometry; and Lawrence Scheinman, the associate director of Cornell University's Peace Studies Program.

Additional hearing transcript materials include pertinent newspaper and journal articles and reports. Particularly important reports include "Iraq Rebuilds Its Military Industries" by Kenneth Timmerman of the House Foreign Affairs Committee's Subcommittee on International Security, International Organizations, and Human Rights, a written IAEA statement on Iraq's nuclear program, and a Foreign Affairs Committee staff report of its July 1993 study mission to IAEA headquarters in Vienna.

United States Congress. House Committee on Foreign Affairs. *Nonproliferation Regimes: Policies to Control the Spread of Nuclear, Chemical, and Biological Weapons and Missiles*. Washington, DC: GPO, 1993. SuDocs no.: Y 4.F 76/1:N 73/3. Item 1017-A. ISBN 0-16-040282-4. 74p.

This report prepared for the House Foreign Affairs Committee by the Library of Congress' Congressional Research Service (CRS) examines existing international efforts to control the proliferation of mass destruction weapons.

The report's executive summary presents a concise overview of existing nuclear, chemical, and missile nonproliferation regimes. Subsequent sections provide more detailed information about these international proliferation control efforts and U.S. policy actions in these areas.

Nuclear nonproliferation covers the first significant section. Its contents list the 1970 NPT Treaty, the IAEA's 1957 authorizing statute, the 1968 Tlatelolco Treaty making Latin America a nuclear free zone, the 1986 Raratonga Treaty making the South Pacific nuclear free, and other significant international proliferation control efforts. Major historical congressional nonproliferation efforts listed include the Atomic Energy Act (1946) and its 1954 amendment, the Energy Reorganization Act (1974), Nuclear Nonproliferation Act (1978), Foreign Assistance Act (1961), and other measures. (p.12-27)

Nonproliferation legislation from the 102d Congress (1991/1992) is included and consists of the Weapons of Mass Destruction Control Act of 1992-Public Law (P.L. 102-484), the Iran-Iraq Nonproliferation Act of 1992 section in the Fiscal Year (FY) 1993 Defense Authorization Act of P.L. 102-484, Aid to Russian and Former Soviet Republics: The Freedom Support Act (P.L. 102-511), and proposed legislation in this area along with an overview of historical and ongoing presidential nonproliferation policies. (p.27-32)

Additional sections of this report examine chemical and biological weapon proliferation regimes emphasizing their respective memberships, organization, verification, enforcement, sanctions options, and reporting requirements. U.S. government agencies with nonpro-

liferation policy jurisdiction are covered as is congressional oversight of executive branch policies in this area.

United States Congress. House Committee on Foreign Affairs. *North Korean. Nuclear Program*. Washington, DC: GPO, 1992. SuDocs no.: Y 4.F 76/1: K 84/12. Item 1017-A. ISBN 0-16-039758-8. 34p.

This 22 July 1992 hearing provides an overview of developments concerning North Korea's nuclear program. Hans Blix, the IAEA's director general, was the principal witness. Blix responded to committee members' questions about North Korean nuclear development and IAEA procedures for inspecting nuclear activity in various countries.

United States Congress. House Committee on Foreign Affairs. *Policy Implications of North Korea's Ongoing Nuclear Program and Markup of H. Con. Res. 179, H. Con. Res. 189, and H. Con. Res. 240*. Washington, DC: GPO, 1992. SuDocs no.: Y 4.F 76/1:N 81/17. Item 1017-A. ISBN 0-16-039929-5. 76p.

This is a transcript of a 21 November 1991 hearing by the House Foreign Affairs Committee's Asian and Pacific Affairs Subcommittee on North Korea's nuclear program along with the markup of resolutions falling within the committee's jurisdiction.

Representative Stephen Solarz (D-NY) chaired the hearing. Featured witnesses included retired Army General John Wickham whose service experience included being the former commander of U.S. forces in South Korea, former Assistant Secretary of Defense Richard Perle, and Han Sung-Joo of Korea University.

Witnesses discussed issues such as personal characteristics of former North Korean leader Kim Il-Sung and his son and eventual successor Kim Jong-Il, Chinese influence over North Korean policies, the status of North Korea's nuclear program, South Korean reactions to North Korean nuclearization, and possible U.S. policy responses to North Korean nuclear weapons acquisition.

Such hypothetical U.S. policy responses, in the view of Representative Solarz, include doing nothing and hoping existing deterrence mechanisms work, encouraging or acquiescing in South Korean nuclear weapons development to foster additional deterrence, imposing sanctions against North Korea in an effort to dissuade it from nuclear weapons development, and taking military action against North Korean nuclear resources. (p.2)

United States Congress. House Committee on Foreign Affairs. *Proliferation and Arms Control in the 1990's*. Washington, DC: GPO, 1993. SuDocs no.: Y 4.F 76/1:P 94/5. Item 1017-A. ISBN 0-16-039963-7. 85p.

The 3 March 1992 hearing before the House Foreign Affairs Committee's Subcommittee on Arms Control, International Security, and Science examined ongoing developments in nuclear proliferation and arms control.

The three witnesses testifying at this hearing were Elisa Harris and Janne Nolan of the Brookings Institution and Louis Nosenzo, director of the Meridian Corporation's Defense Policy Center. The transcript consists of dialogue between committee members and witnesses with no significant supplemental literature included.

United States Congress. Joint Economic Committee. *Arms Trade and Nonproliferation*. Washington, DC: GPO, 1992. SuDocs no.: Y 4.Ec 7:Ar 5/pt. 1. Item 1000-B. ISBN 0-16-037370-0. 298p.

This is a transcript of hearings held in 1990 and 1991 by the Technology and National Security Subcommittee of Congress' Joint Economic Committee. The hearings consist of testimony by Bush administration officials involved in arms trade and nonproliferation issues along with nongovernmental experts.

Topics addressed include the U.S. government's ability to organize export controls on relevant technologies, MTCR member nations, nuclear export controls in other countries, conventional arms sales, China and the MTCR, proliferation as a national security problem, exports to Iraq, the need for less secrecy in the export licensing process, and other pertinent subjects.

United States Congress. Joint Economic Committee. *Arms Trade and Nonproliferation in the Middle East*. Washington, DC: GPO, 1993. SuDocs no.: Y 4.Ec 7:Ar 5/Pt. 2. Item 1000-B. ISBN 0-16-0413664. 112p.

This is a 1992 hearing on Middle East nuclear proliferation and arms trade issues. It features testimony from Senator Jeff Bingaman (D-NM), Representative Pete Stark (D-CA), proliferation experts Kathleen Bailey of the National Institute for Public Policy and Janne E. Nolan of the Brookings Institution, and Bush administration officials in charge of nonproliferation issues from the Commerce, Defense, and State departments.

The Stockholm International Peace Research Institute (SIPRI) and Congressional Research Service (CRS) are included in the hearing transcript.

United States Congress. Office of Technology Assessment. *Export Controls and Nonproliferation Policy*. Washington, DC: GPO, 1994. \$5.50. SuDocs no.: Y 3.T 22/2:2 Ex 7/2. Item 1070-M. ISBN 0-16-045014-4. S/N 052-003-01371-1. 82p.

Another important nuclear proliferation issue for national governments to contend with is the conflict

between national security and increasing exports of nuclear technology to enhance national competitiveness. Developing an effective U.S. export control system to balance these often competing interests is a major challenge for the executive branch and Congress.

This report examines some of the issues involved in this complicated subject. It presents options for enhancing export control effectiveness and easing regulatory burdens on U.S. companies competing with foreign firms with more lenient export controls.

Additional contents include current U.S. nonproliferation export controls, benefits and costs of various U.S. export controls, options for export control enhancement, and specific steps to reduce industrial export burdens such as decreasing the number and purposes of such controls, streamlining the application process, and analyzing and publishing the economic costs of such export controls.

Appendixes include estimated economic costs of export controls and a case study examining the complexities involved in establishing export control thresholds for computers.

United States Congress. Office of Technology Assessment. *Monitoring Limits on Sea-Launched Cruise Missiles*. Washington, DC: GPO, 1992. \$2.25. SuDocs no.: Y 3.T 22/2:2 Se 1. Item 1070-M. S/N 052-003-01298-7. 49p.

The recent Strategic Arms Reduction Talks (START) Treaty did not limit long-range nuclear-armed sea-launched cruise missiles (SLCMs). This report examines problems and issues involved in monitoring possible SLCM limitations within the parameters of possible future nuclear arms agreements.

Specific issues covered include bilateral and unilateral approaches to SLCM arms control, the military role of U.S. and Soviet SLCMs, monitoring methods and problems, weapons testing, deployment, and launcher limits, and politically binding declarations. An appendix provides a technical description of an SLCM and diagrams.

United States Congress. Office of Technology Assessment. *Proliferation of Weapons of Mass Destruction: Assessing the Risks*. Washington, DC: GPO, 1993. \$7. SuDocs no.: Y 3.T 22/2:2 W 37/2. Item 1070-M. ISBN 0-16-41896-8. S/N 052-003001335-5. 123p.

This report describes various weapons of mass destruction, potential consequences of their spread, and their global proliferation status. It provides a survey of nonproliferation policy measures along with possible measures for developing effective nonproliferation policy options.

Major findings of this study note that states in unstable world regions such as the Middle East, South

Asia, and the Korean peninsula are most active in developing mass destruction weapons, proliferation poses particular problems for the United States and other nations, and the breakup of the Soviet Union presents an immediate threat to international nonproliferation regimes. Another conclusion stresses the need for substantial international cooperation for successful nonproliferation policy. Two others note that increasing international technological knowledge and scientific expertise decreases the ability of the United States and its allies to withhold relevant technologies from aspiring producers of such weapons; and that states desirous of producing mass destruction weapons must be convinced that doing so is not in their national interest. (p.4-6)

United States Congress. Office of Technology Assessment. *Seismic Verification of Nuclear Testing Treaties*. Washington, DC: GPO, 1988. \$7. SuDocs no.: Y 3.T 22/2:2 Se 4. Item 1070-M. S/N 052-003-01108-5. 139p.

Verification is an essential element of nuclear arms control. One way of determining compliance or noncompliance with nuclear arms control agreements is through seismic verification of nuclear detonations and tests.

Seismic Verification examines issues germane to this subject focusing on the measuring accuracy of underground explosion yields and what size of underground nuclear test explosions can be seismically monitored with considered confidence. Following an executive summary on seismic monitoring, other chapters address the national security context of seismic verification, seismology's verification role, detecting and identifying seismic events, ways of evading verification monitoring networks, and estimating nuclear explosion yields.

An appendix lists hydrodynamic methods of explosion yield estimation.

United States Congress. Senate Committee on Foreign Relations. *Interpreting the Pressler Amendment: Commercial Military Sales to Pakistan*. Washington, DC: GPO, 1992. SuDocs no.: Y 4.F 76/2:S.Hrg. 102-859. Item 1039-A. ISBN 0-16-039501-1. 98p.

This is a 30 July 1992 Senate Foreign Relations Committee hearing on a legislative amendment proposed by Senator Larry Pressler (R-SD). Pressler's amendment stipulates that no military equipment or technology may be sold or given to Pakistan without presidential assurance that Pakistan does not possess nuclear weapons. (p.1)

This particular hearing examines U.S. policy toward Pakistan in light of the Pressler Amendment and various interpretations of this provision. Witnesses

appearing before the committee include the State Department's Principal Deputy Legal Advisor Michael Matheson, Deputy Assistant Secretary of State for Near Eastern and South Asian Affairs John Malott, Georgetown University School of Law Professor William Eldridge, Jr., and Ralph Earle II of the Washington, DC-based Lawyers Alliance for World Security.

The appendix features State Department responses to questions from Senators Pressler, Claiborne Pell (D-RI), and Frank Murkowski (R-AK).

United States Congress. Senate Committee on Foreign Relations. *Threat of North Korean Nuclear Proliferation*. Washington, DC: GPO, 1992. SuDocs no.: Y 4.F 76/2:S.Hrg. 102-635. Item 1039-A. ISBN 0-16-038687-X. 119p.

This is a transcript of three hearings held by the East Asian and Pacific Affairs Subcommittee of the Senate Foreign Relations Committee on the consequences of North Korea having nuclear weapons. The hearings were held on 25 November 1991, 14 January 1992, and 6 February 1992 and presided over by Subcommittee Chair Senator Alan Cranston (D-CA).

Featured witnesses consisted primarily of academic experts on nuclear proliferation such as Gary Milhollin, Leonard Spector of the Carnegie Endowment for International Peace, and Jeremy Stone of the Federation of American Scientists. Arnold Kanter the State Department's deputy undersecretary for political affairs, was the principal governmental witness.

Topics covered include assessments of the status of North Korea's nuclear program, North Korean economic conditions, prospects for IAEA inspections of North Korean nuclear facilities, the possibility of U.S. military air strikes against North Korea's Yongbyon nuclear reactor, and the possibility of negotiating U.S. policy differences with North Korea.

United States Congress. Senate Committee on Foreign Relations. *U.S. Policy Toward North Korea*. Washington, DC: GPO, 1994. SuDocs no.: Y 4.F 76/2:S.Hrg. 103-553. Item 1039-A. ISBN 0-16-044391-1. 52p.

This is a transcript of a 3 March 1994 hearing by the Senate Foreign Relations Committee's Subcommittee on East Asian and Pacific Affairs. Undersecretary of State for International Political Affairs Lynn Davis was the principal witness. She was questioned by Senators Charles Robb (D-VA), Frank Murkowski (R-AK), and Richard Lugar (R-IN).

Questioning centered around North Korean willingness to permit international inspection of their nuclear program and facilities and the overall status of North Korean nuclear activity. This hearing occurred just prior to the China visit of Secretary of State Warren Christopher. The hearing transcript also

features a report by Senators Sam Nunn (D-GA) and Lugar concerning their recent visit to South Korea and their views on the status of current negotiations with North Korea as well as possible future U.S. policy options.

United States Congress. Senate Committee on Governmental Affairs. *Disposal of Plutonium in Russia*. Washington, DC: GPO, 1993. SuDocs no.: Y 4.G 74/9:S.Hrg. 103-135. Item 1037-B. ISBN 0-16-041263-3. 194p.

The dissolution of the Soviet Union left the status of its nuclear arsenal in uncertainty and produced heightened concern over the stability of that arsenal. An issue of acute importance in this regard involves Russian disposal of plutonium. There is the danger that Russian plutonium may be sold or smuggled to other countries as a means of providing Russia with vitally needed funds. Examining Russian plutonium disposal efforts is the focus of this 9 March 1993 hearing.

Testimony is provided by Senator Hank Brown (R-CO); General William Burns, the State Department's special envoy on Safety, Security, and Dismantlement of Nuclear Weapons; and Joseph Kelley of GAO's International Affairs Issues department on U.S. efforts to assist Russian plutonium dismantling.

Supplemental material includes the text of a decree by Russian Federation President Boris Yeltsin on foreign nuclear power plant construction, a U.S.-Russian agreement on the disposition of highly enriched uranium from nuclear warheads, and scholarly journal articles on various aspects of plutonium disposal.

United States Congress. Senate Committee on Governmental Affairs. *Proliferation Threats of the 1990's*. Washington, DC: GPO, 1993. SuDocs no.: Y 4.G 74/9:S.Hrg. 103-208. Item 1037-C. ISBN 0-16-041553-5. 192p.

The principal witness in this February 1993 hearing on major proliferation threats to the United States during the 1990s was CIA Director James Woolsey, who testified about challenges to U.S. security posed by the actual or potential proliferation of nuclear technology to countries such as Iran and North Korea and by the collapse of the Soviet Union.

Transcript highlights include Woolsey's statement that more than 25 countries, many of them hostile to the United States and its allies, may have or may develop nuclear and other mass destruction weapons and the means to deliver them. (p.9) Other important transcript contents include excerpts from a Russian Foreign Intelligence Service report on the proliferation of mass destruction weapons, correspondence between committee members and former Secretary of Defense Richard Cheney and then-Secretary of Defense Les

Aspin, and questions from committee members to Woolsey on various proliferation topics and Woolsey's responses.

United States Congress. Senate Committee on Governmental Affairs. *Proliferation Watch*. SuDoc Y 4.G 74/9-11:. Item 1037-B. Issue examined: vol. 4, no. 4 (July-August 1993).

This source highlights domestic and international press coverage of nuclear proliferation developments. It opens with an editorial by committee chair Senator John Glenn (D-OH) on the need for the U.S. to retain export controls on nuclear sensitive technologies. An article in this particular issue reported a 10 July 1993 London *Financial Times* story on India's closing its nine heavy water reactors for inspections following a fire at the Narora plants. (p.4)

United States Congress. Senate Committee on Governmental Affairs. *Weapons Proliferation in the New World Order*. Washington, DC: GPO, 1992. SuDocs no.: Y 4.G 74/9:S.Hrg. 102-720. Item 1037-B. ISBN 0-16-039043-5. 44p.

This is a report of a 15 January 1992 committee hearing on weapons proliferation in light of the then-recent collapse of the Soviet Union presided over by Committee Chair Senator John Glenn.

Principal witnesses were then-CIA Director Robert Gates and CIA National Intelligence Officer for Science, Technology, and Proliferation Gordon Oehler. Discussion centered on pertinent proliferation topics such as North Korea's nuclear program, nuclear arsenal security in the aftermath of the Soviet Union's disintegration, the dispersal of Soviet nuclear expertise to other countries, and nuclear development efforts in nations such as Algeria, India, and Pakistan.

United States. Joint Publications Research Service. *Proliferation Issues*. SuDocs no.: PrEx 7.13:TND. Item 1067-M-01. Issue examined: 7 July 1993.

This periodical contains foreign media reports on global proliferation and transfer developments in nuclear, chemical, and biological weapons including delivery systems and weapon-applicable technology transfer.

Coverage is global in scope and focuses on developments in countries such as North Korea, Russia, Argentina, Israel, and Bosnia-Herzegovina. Examples of report contents include a Russian newspaper report of purported dissatisfaction by North Korean President Kim Il-Song toward his son and designated successor Kim Jong-Il for leading North Korea's decision to withdraw from the NPT regime and Czech denials of South Korean newspaper reports that Czechoslovakia's

former Communist government exchanged nuclear military technology with North Korea. (p.6,10)

UNITED NATIONS PUBLICATIONS

Batiouk, Victor. *Ukraine's Non-Nuclear Option*. New York and Geneva: United Nations Institute for Disarmament Research (UNIDIR), 1992. ISBN 92-9045-071-1. 34p.

The disintegration of the Soviet Union caused concern over the dispersal of some elements of the Soviet nuclear arsenal to successor states. Ukraine, as one of these successor states, possessed 176 strategic nuclear missiles with 1,240 warheads. In response to domestic and international pressure, Ukraine declared its intention to eliminate its nuclear arsenal by the end of 1994. (p.1)

This paper, written by Ukraine's Permanent Representative to the United Nations Viktor Batiouk, is a personal exposition of Ukraine's policy decision to reject nuclear weapons ownership. Batiouk opens by examining Ukraine's relationship to the NPT in 1991 along with his assessment of the historical and contemporary factors motivating Ukrainian antinuclear sentiment with particular emphasis given to the Chernobyl disaster.

He proceeds to profile the Ukrainian Parliament's 24 October 1991 antinuclear policy statement (p.7-9), list specific reasons for Ukraine's rejection of a nuclear arsenal, and discuss possible foreign policy and military security implications of a non-nuclear Ukraine.

Appendixes list Ukrainian national sovereignty and independence declarations as well as other Ukrainian nuclear policy declarations.

Chauvistre, Eric. *The Implications of IAEA Inspections under Security Council Resolution 687*. New York and Geneva: UNIDIR, 1992. ISBN 92-9045-059-2. 84p.

The United Nations Security Council passed resolution 687 on 3 April 1991 requiring international inspection, removal, destruction, or rendering useless of all Iraqi mass destruction weapons, facilities, and delivery mechanisms. (p.5) This report examines the implementation of this resolution and possible implications it may have in future IAEA efforts to restrain nuclear proliferation.

Following the executive summary and introduction, Chauvistre provides background information on Resolution 687 and Iraq's responses. Further contents include summaries of six 1991 IAEA nuclear facility inspection missions and future IAEA monitoring and verification rights in examining Iraqi compliance or noncompliance with this resolution.

The second part of Chauvistre's report examines IAEA safeguards focusing on debate over these safeguards at the fourth NPT review conference in 1990, institutional limits to safeguard improvements, regional nonproliferation approaches and more intrusive verification controls, and potential unilateral action against proliferants if more intrusive controls are not available.

The concluding chapter chronicles the experiences of the Security Council inspectors in Iraq and prospects for improving inspection safeguards and developing further controls on proliferant states. A final assessment contends that strengthening IAEA inspection enforcement authority could contradict IAEA's mission to promote nuclear energy, that IAEA's existing enforcement budget is jeopardized by the efforts of some IAEA-member states to "freeze" its budget, that the absence of an internationally credible nuclear control system could have negative political and environmental repercussions, and that some areas of national sovereignty and security must be sacrificed to achieve more effective controls against proliferation. (p.35-36)

Goldblat, Jozef. *The Non-Proliferation Treaty: How to Remove the Residual Threats* (Research Paper no. 13). New York and Geneva: United Nations and UNIDIR, 1992. ISBN 92-9045-069-X. ISSN 1014-4013. 36p.

This study examines various ways to strengthen the nonproliferation regime as embodied in the 1968 NPT agreement consisting of some 150 nations as of September 1992. (p.11)

Contents include examinations of NPT's implementation status, nuclear safeguards such as providing facilities design information, nuclear material safety in domestic use, international transportation, nuclear weapons safety, and nuclear supplies. Other subjects addressed include controls on nuclear-capable missiles, MTCR assessment, NPT arms control stipulations, and suggested NPT amendment procedures.

Appendixes include NPT text and recent pertinent documents.

Nuclear Deterrence: Problems and Perspectives in the 1990's. Serge Sur, ed. New York and Geneva: United Nations and UNIDIR, 1993. ISBN 92-9045-084-3. 173p.

These proceedings of a United Nations Institute for Disarmament Research (UNIDIR) conference in Paris on 10-11 December 1992 examine the role of nuclear deterrence and its possible impact on proliferation. Conference participants include governmental policymakers and subject experts from countries such as the United States, India, France, China, Egypt, Nigeria, Russia, Germany, and various United Nations officials.

Topics covered include the future of nuclear deterrence, recent and prospective nuclear arsenal developments, nuclear proliferation prospects, the future of the nonproliferation regime, consequences for deterrence posed by nuclear threshold states, space and nuclear deterrence, and minimal deterrence and regional security. These topics are presented as speeches and contain the responses of conference participants adding their own perspectives to the issues being addressed.

A speech by former U.S. Arms Control and Disarmament Agency (ACDA) Director Ronald Lehman concludes the conference proceedings.

United Nations Office for Disarmament. *Non-Proliferation and Confidence Building Measures in Asia and the Pacific*. (Disarmament Topical Papers 10). New York: United Nations, 1992. ISBN 92-1-142-195-3. 183p.

These proceedings of an August 1992 United Nations conference in Hiroshima, Japan, feature presentations by an international panel on nuclear proliferation in Asia and the Pacific.

Specific presentation topics include strengthening existing nonproliferation regimes, NPT achievements and new obligations, preventing nuclear proliferation in the former Soviet Union, possible solutions to Korean peninsula nuclearization, developments in Southeast Asia and Indochina, former Soviet weapons engineers and nonproliferation, realizing a nuclear-free Korean peninsula, and constructing and strengthening Asian confidence and security without resorting to nuclear weapons development.

Contents also include conference working group reports on nonproliferation and welcoming speeches by United Nations and Japanese officials.

INTERNET SOURCES

In addition to traditional print sources, there are Internet-accessible sources of nuclear proliferation information. A steadily increasing number of U.S. government agencies have placed their publications on the Internet, and with diligent searching one can find those dealing with nuclear proliferation. For instance, publications by Congress' Office of Technology Assessment (OTA) can be found by telnetting to the Capital Access Bulletin Board at cap.gwu.edu login: visitor; password: guest. Once logged in, users can follow on-screen instructions or type "go ota" to reach OTA publications.

OTA also has a file transfer protocol (FTP) site for users desirous of downloading selected OTA publications. The address for this is otabbs.ota.gov login: anonymous; password: your e-mail address.

Once logged in you can select the desired reports by typing "get cd/pub/" and the file name for the report you want. For instance, if you want to FTP the *Export Controls and Nonproliferation Policy* report mentioned earlier, type "get cd/pub/expprtcon."

Anyone interested in exploring the status of current and recent historical congressional legislation on nuclear proliferation can search the Library of Congress Information System (LOCIS). The telnet address for LOCIS is locis.loc.gov 23 and it contains legislative history and bill status information going back to the 93d Congress in 1973-1974.

Another useful source of electronic nuclear proliferation is through Radio Free Europe (RFE) reports. The gopher address for RFE is gopher.feld.cvut.cz 70. Once converted to this Czech site, select 15. Politicke zpravodajstci-Political News. RFE news reports on events in central and eastern Europe and the former Soviet Union going back to October 1993 are retrievable. These reports are compiled from Monday through Friday. Although there may be spotty coverage for some dates, this is a good source for breaking news from these regions on nuclear proliferation and numerous other political, diplomatic, and military developments.

The United Nations and its affiliated agencies also post some of their publications on the Internet. A UN Internet site of particular interest to students of nuclear proliferation is the IAEA gopher server at this organization's Vienna headquarters. The gopher address for this particular database is nesirs01.iaea.or.at 70. Once logged in, the IAEA main gopher menu reads as follows:

- 1) About the IAEA Gopher Service
- 2) About the International Atomic Energy Agency
- 3) Programmes
- 4) Public Information News Services
- 5) International Nuclear Information System (INIS)
- 6) AGRIS (International Information System for the Agricultural Sciences)
- 7) Networking and Computing
- 8) Library Services
- 9) Vacancy Notices
- 10) Official Holidays
- 11) Publications
- 12) Phone and E-Mail Directory

The IAEA gopher is still under construction but items of interest that can be found on it include IAEA news briefs and press releases as well as INIS information. Hopefully, the IAEA will place larger volumes

of information and reports on this server. The IAEA's central e-mail address is iaeo@iaea1.or.at for those who wish to make suggestions for enhancing this particular database.

It is also possible to do Veronica searches on the Internet to product results on nuclear proliferation. A recent search of "nuclear proliferation" through the University of Texas-Dallas gopher server produced 17 hits including the text of the 1968 version of the NPT.

BOOKS

Bailey, Kathleen C. *Doomsday Weapons in the Hands of Many: The Arms Control Challenge of the '90s*. Urbana: University of Illinois Press, 1991. ISBN 0-252-01826-5. 158p.

This concise work examines the importance of nuclear, chemical, and biological weapons as current arms control challenges in light of the diminution of the nuclear rivalry between the United States and former Soviet Union.

Material in this compilation focuses on the decreasing difficulty of nuclear weapons development due to the widespread diffusion of nuclear knowledge; examples of nuclear proliferation in countries such as India, Pakistan, and Israel; and international nuclear nonproliferation policies.

Later chapters examine nations having chemical weapons and their reasons for possessing such armaments, chemical weapons control policies, biological and toxin agents, the growth of cruise missile proliferation, and U.S. missile proliferation policies.

Appendixes list major international agreements on nuclear, chemical, and biological warfare.

Bailey, Kathleen C. *Strengthening Nuclear Nonproliferation*. Boulder, CO: Westview Press, 1993. ISBN 0-8133-2006-2. 132p.

This book lists various measures for strengthening nonproliferation efforts. Opening chapters examine the purpose and performance of NPT, the failure of proliferation control policies emphasizing restrictions on the supply of relevant knowledge and technology, and limitations on detecting and verifying nuclear weapons development.

Intermediate chapters assess the changed international political, diplomatic, and military environment following the Soviet Union's disintegration, the impracticality of nuclear disarmament and ending nuclear weapons testing, IAEA inspection procedures, international sanctions against proliferating states, security assurances, and educating nuclear aspiring states on proliferation's multiple costs.

The conclusion focuses on regional conflict resolution, widening participation in arms control agreements, and considering military intervention.

Appendixes list three UN resolutions against Iraq's nuclear weapons program.

Barnaby, Frank. *How Nuclear Weapons Spread: Nuclear Weapon Proliferation in the 1990s*. London: Routledge, 1993. ISBN 0-415-07674-9. 144p.

Barnaby presents an overview of ongoing nuclear proliferation developments. The introduction stresses the benefits of nuclear technology as applied to medicine, agriculture, and industry while stressing the problem of plutonium production. (p.ix-xii)

The principal introductory sections examine linkage between peaceful and military programs; the plutonium economy and highly enriched uranium; components of nuclear and thermonuclear weapons such as critical mass, implosion, and detonator firing; nuclear weapon testing; dismantling nuclear weapons; and plutonium disposal methods such as burning in reactors and mixing with high-level radioactive waste.

Intermediate sections assess prospects for existing national nuclear arsenals and nuclear proliferation to threshold states such as Israel, Iraq, Iran, Brazil, and South Africa. Entries for many of these countries also examine the status of international safeguards against the spread of nuclear weapons capability to these respective countries.

Final chapters examine nuclear proliferation to subnational organizations such as terrorist groups and the dangers inherent in such occurrences, proliferating nuclear weapon delivery systems, ways of preventing nuclear proliferation through current NPT and IAEA safeguards, and the possible need to create a new international nuclear control agency to combat problems such as nuclear smuggling.

Blackwill, Robert D., and Albert Carnesale, eds. *New Nuclear Nations: Consequences for U.S. Policy*. New York: Council on Foreign Relations Press, 1993. ISBN 0-87609-1503-2. 272p.

This collection of essays examines the emergence of nuclear-capable nations in light of the Soviet Union's breakup and the consequences of this for the United States. The initial essay sets the subject of nuclear proliferation in context by positing a scenario of how Operation Desert Storm's conduct might have been affected had Iraq possessed usable nuclear weapons.

Additional chapters focus on new nuclear threats to U.S. security, arms control for new nuclear nations, diplomatic responses, assisting newly proliferating states, implications for U.S. military strategy, offensive military options against nuclear threats, defenses against

new nuclear threats, and the role of intelligence operations and assessments.

New Nuclear Nations' conclusion mentions possible solutions to the proliferation problem but warns that dealing with new nuclear threats is difficult, that existing measures are useful but probably insufficient, and that preventing and, if feasible, reversing nuclear proliferation should be the highest priority of U.S. policy. (p.259)

Cantelon, Philip L., Richard G. Hewlett, and Robert C. Williams, eds. *The American Atom: A Documentary History of Nuclear Policies from the Discovery of Fission to the Present*. 2d ed. Philadelphia: University of Pennsylvania Press, 1991. ISBN 0-8122-3096-5. 369p.

The development of nuclear power and nuclear weapons has produced documents of immense importance to historical researchers. Some of these important source materials are compiled in this book.

Contents cover much of the twentieth century including H.G. Wells' fictional vision of nuclear energy and Albert Einstein's 1939 letter to President Franklin Roosevelt apprising him of German nuclear research and the need for the United States to conduct such research as well.

Material from the Manhattan Project is presented, such as correspondence of Robert Oppenheimer; General Leslie Grove's report on the Trinity explosion near Alamogordo, New Mexico, on 16 July 1945; and accounts of President Truman obliquely informing Stalin at Potsdam of American's nuclear capability.

Later chapters address atomic energy after World War II, the hydrogen bomb, Oppenheimer's security clearance suspension and the ensuing controversy surrounding this, nuclear testing and the 1963 Test Ban Treaty, nuclear deterrence, arms control agreements, and nuclear power.

Specific documents listed include the McMahon Bill (Atomic Energy Act of 1946), President Eisenhower's 1955 "Atoms for Peace" address to the United Nations, Hans Bethe's 1954 denunciation of hydrogen bomb development, excerpts from Herman Kahn's provocative and controversial 1960 book *On Thermonuclear War*, a 1984 statement by President Reagan on the Strategic Defense Initiative, the 1972 U.S.-Soviet Anti-Ballistic Missile (ABM) Treaty, the unratified 1979 Strategic Arms Limitation Talks (SALT) II treaty between the United States and Soviet Union, the U.S. Catholic Bishops Pastoral Letter on war and peace (1983), the 1987 U.S.-Soviet Intermediate Nuclear Forces (INF) Treaty, comments by Edward Teller on nuclear power development (1953), and reports on the Three Mile Island (1979) and Chernobyl (1986) nuclear power plant accidents.

Carus, W. Seth. *Ballistic Missiles in the Third World: Threat and Response*. New York and Washington, DC: Praeger Publishers/Center for Strategic and International Studies, 1990. (The Washington Papers 146). ISBN 0-275-93750-X pa. 82p.

The use of Scud missiles by Iraq during Operation Desert Storm enhanced public awareness of the potential military implications of Third World nations possessing ballistic missiles. *Ballistic Missiles in the Third World* provides a succinct overview of this development and suggests ways for the United States to cope with this challenge.

Carus examines the role of surface-to-surface missiles in the Third World and the multiple motivations for the proliferation of such missiles. Later chapters cover Third World ballistic missile proliferation including areas such as the ballistic missile trade, technology transfer, and the role of ostensibly civilian space programs in augmenting such proliferation.

Additional chapters chronicle ballistic missile capabilities such as speed of attack and responses to such weapons including retaliation, hardening facilities, electronic countermeasures, and active defenses.

The conclusion suggests ways to limit ballistic missile proliferation such as strengthening intelligence capabilities and emphasizing regional and bilateral programs to combat this problem. (p.62,59)

Carus, W. Seth. *Cruise Missile Proliferation in the 1990's*. Westport, CT, and Washington, DC: Praeger Publishers/Center for Strategic and International Studies, 1992. (The Washington Papers 159). ISBN 0-275-94520-0 pa. 176p.

The Persian Gulf War demonstrated the increasing importance of cruise missiles in military combat. The relatively low cost of these weapons has made them affordable for many Third World nations while providing export revenue for producer nations. The ability of these missiles to be armed with nuclear warheads also has significant political and military implications.

This work focuses on ongoing cruise missile proliferation while providing an overview of these weapons. It proceeds to focus on types of cruise missiles such as strategic, antiship, tactical land attack, and harassment drones while emphasizing cruise missile advantages such as accuracy and evasion of hostile air defenses.

Coverage is provided of cruise missile acquisition by Third World nations and characteristics of cruise missile guidance such as inertial navigation systems, digital terrain comparison, satellite navigation, and terminal guidance. Examination of cruise missile construction focuses on airframes, propulsion systems, flight controls, and warheads.

The concluding chapter examines possible responses to cruise missile proliferation. Such responses include the development of antiballistic missile (ABM) systems such as the Patriot missile, enhancing the strength of the MTCR, possible arms control agreements, and developing diverse land and ship-based missile defense systems.

Appendixes list American, British, French, and German cruise missile systems along with an international inventory of cruise missile systems and components with countries of origin.

Clausen, Peter A. *Nonproliferation and the National Interest: America's Response to the Spread of Nuclear Weapons*. New York: Harper Collins College Publishers, 1993. ISBN 0-06-501395-6. 222p.

This historical study of U.S. policy on nuclear weapons proliferation since World War II examines the relationships between nonproliferation and key themes of U.S. foreign and national security policy and how the desire to limit the spread of nuclear weapons has created tension with U.S. foreign policy objectives. (p.xiii)

Contents include the role of the atomic bomb and the Soviet Union during the immediate postwar period, the Eisenhower administration's Atoms for Peace policy, the roles of nuclear deterrence and nonproliferation in North Atlantic Treaty Organization (NATO), the emergence of NPT in the 1960s, and geopolitical factors in nonproliferation policy such as Indian and Israeli quests for nuclear weapons.

Concluding chapters cover nuclear policy during the Ford and Carter administrations, declining emphasis on nonproliferation during the Reagan and Bush presidencies, and post-Cold War proliferation issues and dilemmas including the NPT's 1995 extension.

Appendixes feature an overview of nuclear technology and proliferation and the text of the NPT as signed and ratified by the United States.

Fischer, David. *Stopping the Spread of Nuclear Weapons: The Past and the Prospects*. London: Routledge, 1992. ISBN 0-415-00481-0. 336p.

The author, a former IAEA official and participant in drafting IAEA's initial authorization, provides a historical overview of efforts to limit the spread of nuclear weapons and discusses issues of consideration for the NPT's 1995 extension.

Stopping the Spread of Nuclear Weapons is divided into three parts. The initial section focuses on early national and international proliferation control efforts such as the U.S. McMahon Act of 1946 and the institutional development and evolution of IAEA.

An intermediate section focuses upon treaties within the NPT such as the Tlatelolco Treaty (1968)

and Rarotonga Treaty (1986) making Latin America and the South Pacific nuclear free zones. This section also includes discussion of NPT safeguards such as IAEA inspections of nuclear facilities in participating nations.

The final section examines emerging NPT regime issues such as nuclear submarines, plutonium production, nuclear terrorism, interactions between nuclear weapons states, nations aspiring to obtain nuclear weapons, and those renouncing such status along with assessments of possible developments at 1995 NPT negotiations and beyond.

Appendixes include the NPT's text and signatory nations to the NPT, Tlatelolco, and Rarotonga treaties.

Fischer, David. *Towards 1995: The Prospects for Ending the Proliferation of Nuclear Weapons*. Brookfield, VT: Dartmouth Publishing Company and UNIDIR. ISBN 1-85521-322-2. 292p.

This source reviews the spread of nuclear weapons and initiatives taken to control this spread as well as prospects for proliferation containment for the remainder of the century emphasizing the 1995 NPT extension conference.

It provides historical overview of the international nuclear nonproliferation regime focusing on how since the IAEA's 1957 statutory authorization its purposes have been to 1) promote the peaceful use of nuclear energy, 2) further nuclear safety, and 3) apply safeguards to insure nuclear materials are not used to manufacture nuclear weapons. (p.32)

Other chapters address the role of nuclear weapons states and nonnuclear weapons states in restraining the spread of nuclear weapons; NPT safeguards, export conditions, and controls; NPT's role in assisting economic development; peaceful nuclear explosions; NPT serving as a vehicle for nuclear disarmament; and nuclear free zones.

Concluding chapters are grouped around NPT's 1995 extension. This section focuses on possible NPT amending and renewing actions, ratification, withdrawing from NPT, and possible means of ensuring that international nonproliferation efforts remain strong.

Concerning the NPT's future the author sees four possible options:

- 1) Indefinite extension.
- 2) Indefinite series of relatively long treaty extensions with individual nations being able to terminate their participation after any extension.
- 3) Indefinite series of relatively short treaty extensions with similar optional termination options.

- 4) A single multi-year treaty extension or limited number of fixed-term extensions. (p.225)

Fischer also believes that the choice taken depends on the actions of nuclear weapons states prior to 1995 and on the perceptions of developing nations that have signed NPT and whose numerical superiority will determine the type of agreement achieved. (p.226)

Gardner, Gary. *Nuclear Nonproliferation: A Primer*. Boulder, CO: Lynne Rienner Publishers, 1992. ISBN 1-55587-478-9. 141p.

This overview examines various aspects of nuclear proliferation. Initial chapters provide technical information on the nuclear process covering nuclear fission, the nuclear fuel cycle, and nuclear reactors. Specific sections of these introductory chapters examine the components of an atom; neutrons and plutonium production; nuclear fuel cycle processes such as conversion, fabrication, spent-fuel storage, reprocessing, and waste disposal; nuclear reactor operating; and a taxonomy of nuclear reactors including light and heavy water, gas-cooled, and fast breeder.

Intermediate chapters cover the nonproliferation regime's historical and legal background along with the development of international safeguards against proliferation and political issues involved in nuclear proliferation.

Concluding chapters focus on the 1995 NPT extension conference, nations of proliferation concern such as Iran and North Korea, current challenges to nonproliferation such as international gluts of plutonium and uranium, and the proliferation potential of the former Soviet Union.

A summary lists key issues covered in this useful volume and a list of supplemental readings.

Muller, Harald, ed. *A European Non-Proliferation Policy: Perspectives and Problems*. Oxford: Oxford University Press, 1987. ISBN 0-19-829702-5. 416p.

This collection of essays examines the historical development of western European nuclear proliferation and Europe's influence on non-European nations desirous of enhancing their nuclear capabilities.

The first of this volume's two parts examines European nonproliferation policy focusing on the development of the British and French nuclear weapons programs, European nuclear power, the role of European institutions in formulating nonproliferation initiatives, IAEA activities, and structural aspects of western European nonproliferation policies such as security and arms control along with divergent national economic interests.

The second part focuses on the scope for western European influence on nuclear threshold countries through trade, scientific expertise, and other forms of economic and diplomatic interaction. Threshold countries profiled include India, Pakistan, Iran, Israel, Libya, South Africa, Brazil, and Argentina.

Nolan, Janne E. *Trappings of Power: Ballistic Missiles in the Third World*. Washington, DC: The Brookings Institution, 1991. ISBN 0-8157-6095-7pa. 209p.

Iraq's use of Scud missiles during the Gulf War, although ultimately unsuccessful, helped enhance public awareness of their potential significance in future military conflicts. *Trappings of Power* illustrates how the spread of ballistic missile technology to developing nations complicates the international political and security environment. Nolan makes the following contention about the significance of this problem:

The spread of missile technology to unstable regions of the world poses serious dilemmas for policymakers. The technical characteristics of ballistic missiles, including the speed with which they can reach targets, their invulnerability to defenses, their adaptability for delivering warheads of mass destruction, and their particular utility for preemptive military operations, makes them inherently destabilizing in regions where combat is likely to occur. Not coincidentally, most of the significant new missile producers are in the Middle East, the Persian Gulf, and South and Northeast Asia, all regions of chronic tension. (p.8)

Contents stress the significance of technology diffusion on U.S. interests, the context of Third World defense investment, ballistic missile producers, the military significance of ballistic missiles, the bureaucratic dimension of missile technology proliferation demonstrated in U.S. military sales policy, and a statement of measures the author believes to be necessary for promoting an international technology security regime.

Pande, Savita. *Pakistan's Nuclear Policy*. New Delhi: B.R. Publishing Corporation, 1991. ISBN 81-7018-657-9. 201p.

South Asia is a center of activity for those concerned with nuclear proliferation. Historical enmity between India and Pakistan has caused both of these nations to try and obtain nuclear weapons. This particular work presents an Indian perspective on Pakistan's nuclear development.

An introduction provides an overview of factors causing nations to obtain nuclear weapons. One point

the author makes is that conducting a nuclear weapons test has traditionally been the established standard for being a nuclear power. Pande asserts this definition should be broadened to nations having made the requisite nuclear construction and testing preparations without actually testing the weapon due to political reasons instead of insufficient technical capability. (p.4-5)

The next chapter covers the evolution of the Pakistani nuclear program from its genesis in 1955 (p.26) and some of the individuals and operations involved in enhancing that country's nuclear capability. Following chapters address the roles of the United States, Islamic nations, and China in influencing Pakistani nuclear development with particular emphasis on the evolutions in U.S. policy toward Pakistani nuclear acquisition.

The final two chapters address Pakistan's response to the nonproliferation regime including the 1963 partial Test Ban Treaty, NPT, and the proposed establishment of a nuclear weapons free zone in South Asia. The conclusion highlights the issues involved in Pakistan's nuclear development and emphasizes the importance of Pakistan's military defeat by India in 1971, along with the absence of significant Western and Chinese support, as factors further stimulating Pakistani nuclear development. (p.159-161)

Pilat, Joseph F., and Robert E. Pendley, eds. *Beyond 1995: The Future of the NPT Regime*. New York: Plenum Press, 1990. ISBN 0-306-43271-9. 257p.

This source includes essays by an international panel of experts on the proposed 1995 extension of the NPT.

Writings examine the NPT's current status, criticisms of the NPT, hypothetical consequences of NPT's collapse, the possible fate of safeguards if NPT is not renewed, whether the NPT matters, and an examination of proliferation without NPT. Other chapters express global concern over nuclear weapons proliferation, working toward a global framework of nuclear restraint, European and international security without NPT, East Asian proliferation, global and regional power relations apart from NPT, whether India should sign the NPT, and speculation on the overall international impact of a world without NPT.

An appendix lists relevant UN nonproliferation resolutions from 1959-1988.

Pilat, Joseph F., ed. *The Nonproliferation Predicament*. New Brunswick, NJ: Transaction Books, 1985. ISBN 0-88738-047-6. 137p.

This collection of essays focuses on various aspects of nonproliferation from the perspective of the middle 1980s. Subjects addressed include a historical overview

of U.S. nonproliferation policy, early Reagan administration nonproliferation policy, congressional involvement in nonproliferation issues and attempts to influence executive branch policy in this area, the nuclear proliferation market, countries such as Pakistan, Iraq, Iran, Libya, and others representing proliferation problems at this time, the possible relevance of nuclear weapons proliferation to U.S. national security, and future issues confronting nations desirous of limiting nuclear proliferation.

Reiss, Mitchell. *Without the Bomb: The Politics of Nuclear Proliferation*. New York: Columbia University Press, 1988. ISBN 0-231-06438-1. 337p.

Reiss presents a study of the political factors influencing nations in their decisions to develop or not develop nuclear arsenals for national defense. This work, divided into three parts, focuses on countries that decided not to develop nuclear weapons.

Part one provides an overview of evolving international perspectives on nuclear proliferation. Such viewpoints have moved from the 1950s' desire to halt proliferation, to the 1960s' and 1970s' perspective of controlling proliferation, and on to the then-current objective of living with this phenomenon. (p.xxii)

The second section presents case studies of six countries that officially decided not to develop nuclear weapons. These countries include Sweden, South Korea, Japan, Israel, South Africa, and India. While all of these countries possess the requisite technical capability to produce nuclear weapons, their decisions not to do so publicly stem from factors such as domestic and international political and economic constraints or insufficient military delivery capability.

The final chapter provides more specific information on the factors causing these countries to forego nuclear weapons development. These criteria include domestic opposition, bilateral disincentives such as jeopardizing relations with a militarily allied power, international nonproliferation agreements, and general international disapproval against nuclear weapons.

Rioux, Jean-Francois, ed. *Limiting the Proliferation of Weapons: The Role of Supply-Side Strategies*. Ottawa: Carleton University Press, 1992. ISBN 0-88629-192-5. 195p.

Approaches to limiting the spread of nuclear weapons can be divided into "demand side" and "supply side" perspectives. Proponents of the former prefer using incentives and disincentives such as economic and political development and great power security guarantees to persuade nuclear aspirant nations that acquiring nuclear weapons is not in their best interests. Supply-side policies stress the use of embargoes, weapons export controls, and other restrictions

on materials and technology as means of preventing nuclear proliferation. (p.2-3)

This collection of essays examines the use of both of these approaches but with greater emphasis on supply-side strategies. The initial section of this collection examines trends in nuclear proliferation and supply-side controls, whether new nuclear producing nations such as Japan and Brazil threaten existing supply-side restraints, and if leaks in current nuclear export controls can be plugged.

Subsequent essays focus on approaches to controlling chemical and biological weapons, ballistic missile proliferation and the MTCR, trends in conventional weapon production and transfer, and international arms trade trends.

Appendixes list groups of nuclear supplying powers; the text of a 1991 London Economic Summit declaration on arms transfers and nonproliferation by the United States, United Kingdom, Canada, France, Germany, Italy, and Japan; another 1991 declaration on these subjects by the five UN Security Council members China, France, Great Britain, Soviet Union, and the United States; and 1992 nuclear suppliers group guidelines for transferring nuclear-related equipment and technology.

Snyder, Jed C., and Samuel F. Wells, Jr., eds. *Limiting Nuclear Proliferation*. Cambridge, MA: Ballinger Publishing Company, 1985. ISBN 0-88730-042-1. 363p.

This source includes essays on nuclear proliferation from the perspective of the middle 1980s. It opens with a foreword by former U.S. Secretary of Defense and Energy James Schlesinger. An editorial introduction presents an overview of the book's contents as well as surveying extant critical thought on proliferation.

The first part presents studies of selected nuclear threshold states including Iraq, Israel, India, Pakistan, Argentina, Brazil, and South Africa. This section covers the efforts of these nations to acquire potential nuclear weapons capabilities and of various international efforts to prevent these states from obtaining nuclear armaments.

A second part examines U.S. nuclear exports and the nonproliferation regime along with the former Soviet Union's nuclear export policies.

The concluding section addresses management strategies and possible policy alternatives to then-existing proliferation challenges. Areas of emphasis in this regard include proposing a comprehensive U.S. nonproliferation policy and recognizing the need for diverse and flexible policies to counter nuclear proliferation and diminish the threat of regional nuclear war stemming from regional rivalries.

Spector, Leonard S., with Jacqueline Smith. *Nuclear Ambitions: The Spread of Nuclear Weapons, 1989-1990*. Boulder, CO: Westview Press, 1990. ISBN 0-8133-8074-X. 450p.

Spector and Smith provide an overview of nuclear proliferation at the beginning of the 1990s emphasizing developments in nuclear threshold nations.

An introductory global trends section examines changing U.S.-Soviet relations, the silent spread of nuclear weapons without explosions by nuclear threshold powers, ballistic missile proliferation, new nuclear trade patterns, and nuclear submarines.

Subsequent sections focus on nuclear aspiring powers in Asia, the Middle East, Latin America, and Africa. Each continental section opens with a contextual overview and proceeds to chronicle nuclear developments in nations within these regions such as Pakistan, Libya, Argentina, and South Africa.

A final section examines nonproliferation regime controls and safeguards with appendixes listing ways of making nuclear weapons, IAEA safeguards, and relevant international treaties.

Van Creveld, Martin. *Nuclear Proliferation and the Future of Conflict*. New York: The Free Press, 1993. ISBN 0-02-933156-0. 180p.

The author presents a historical overview of military strategy whose preeminent focus is on the increasing importance of regional conflict and consequent increase in the potential use of nuclear weapons in such confrontations.

The initial chapter presents an overview of war before nuclear weapons emphasizing how the nation-state eventually obtained a monopoly on the legal use of violence. (p.11) Subsequent chapters focus on how nuclear weapons changed the global military environment; nuclear weapons development in Asian states such as China, India, and Pakistan; and comparable nuclear weapons development in Israel and the Arab states.

A concluding chapter focuses on the author's view of future military conflicts and the potential influence of nuclear weapons in such confrontations. Augmented with extensive use of non-English language sources, this volume by a prominent Israeli scholar is a succinct yet substantive portrayal of nuclear proliferation.

NOTES

1. U.S. Department of State, *Patterns of Global Terrorism 1993* (Washington, DC: GPO, 1994), 22-25.

(continued on page 92)

11. Trish Ridgeway, *Library Orientation Methods, Mental Maps, and Public Services Planning* (Rock Hill, SC: Winthrop College, 1983). ERIC ED247942.

12. Nathan Gale, Reginald G. Golledge, James W. Pellegrino, and Sally Doherty, "The Acquisition and Integration of Route Knowledge in an Unfamiliar Neighborhood," *Journal of Environmental Psychology* 10 (March 1990): 3-25.

(Continued from page 69)

2. President George Bush, *National Security Strategy of the United States* (Washington, DC: GPO, 1993), 16.

3. Heather Wilson, "Missed Opportunities: Washington Politics and Nuclear Proliferation," *The National Interest* no. 34 (Winter 1993/94): 27. Wilson served as director for defense policy and arms control on the National Security Council staff from 1989 to 1991.

4. Wilson, 28.

5. See W. Seth Carus, *Cruise Missile Proliferation in the 1990s* (Westport, CT, and Washington, DC: Praeger/Center for Strategic and International Studies, 1992), 89-94 for an

overview of the Missile Technology Control Regime (MTCR). This voluntary arrangement to prevent the proliferation of nuclear warhead carrying missiles was formulated in 1987 by the United States, Canada, France, Germany, Great Britain, Italy, and Japan. By 1991, membership expanded to include Australia, Austria, Belgium, Denmark, Finland, Luxembourg, the Netherlands, Norway, Spain, and Sweden. Other nations, including the former Soviet Union, agreed to abide by MTCR provisions without becoming formal members.
