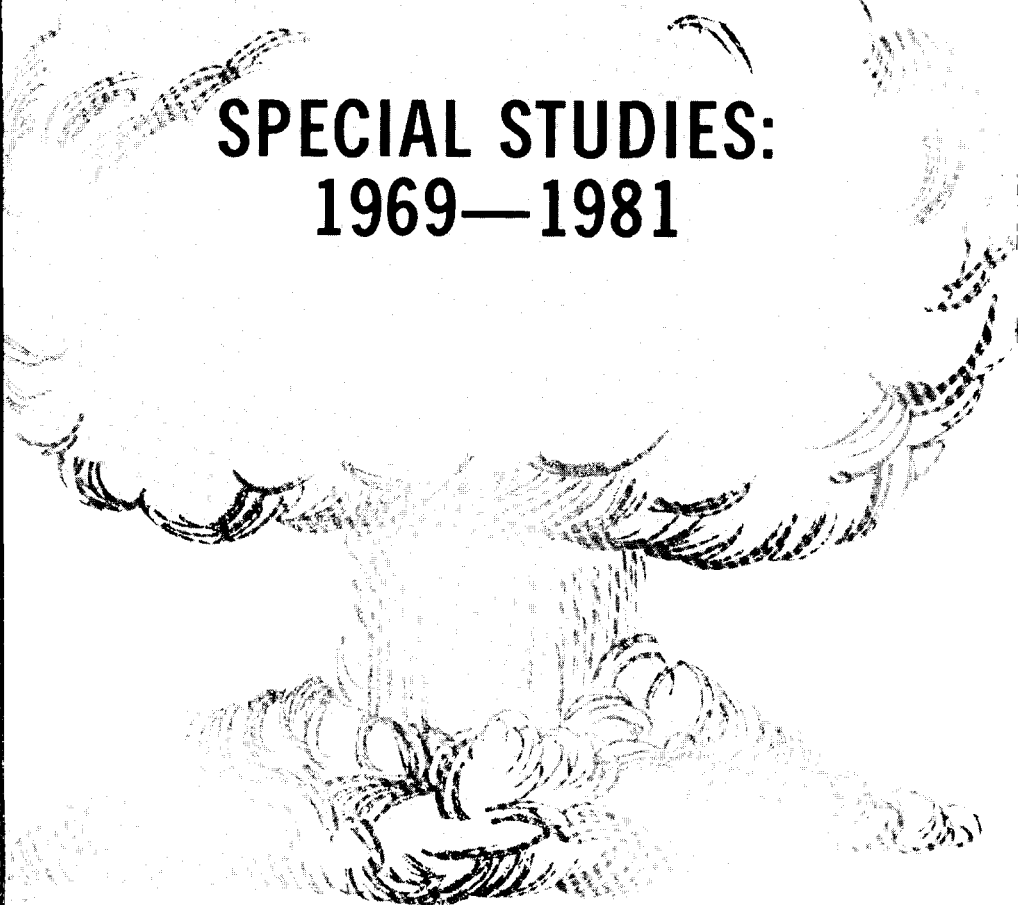


**NUCLEAR WEAPONS,
ARMS CONTROL,
and the
THREAT OF
THERMONUCLEAR WAR:**

**SPECIAL STUDIES:
1969—1981**



A Guide to

**NUCLEAR WEAPONS, ARMS CONTROL,
and the
THREAT OF THERMONUCLEAR WAR:
SPECIAL STUDIES: 1969—1981**

Guide Compiled by
Robert Lester

Edited by
Paul Kesaris

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Acronyms and Abbreviations

MBFR:	Mutual Balanced Force Reduction
NATO:	North Atlantic Treaty Organization
NORAD:	North American Air Defense Command
SAC:	Strategic Air Command
SALT:	Strategic Arms Limitation Treaty
U.S.:	United States
U.S.S.R.:	Union of Soviet Socialist Republics

REEL INDEX

Reel I

Frame

- 0001 **Disarmament in Perspective: An Analysis of Selected Arms Control and Disarmament Agreements between the World Wars, 1919-1939. Volume I. Disarmament and the Peace Conference.**
California State College Foundation, Los Angeles. Richard Dean Burns, Donald Urquidi, Arthur L. Smith, Jr., and Seymour Chapin. July 1968. 244pp.
Contents: The armistices, 1918; disarming the vanquished; the Versailles treaty and German disarmament; the Versailles treaty and territorial demilitarization; disarming the vanquished; Austria, Hungary and Bulgaria; the peace conference and general disagreement; German disarmament and allied military control, 1920-1927, and German disarmament, 1927-36: compliance and evasions.
- 0243 **Disarmament in Perspective: An Analysis of Selected Arms Control and Disarmament Agreements between the World Wars, 1919-1939. Volume II. Demilitarization of Frontiers, Islands and Straits.**
California State College Foundation, Los Angeles. Richard Dean Burns, Donald Urquidi, Arthur L. Smith, Jr., and Seymour Chapin. July 1968. 148pp.
Contents: The Russo-Finnish treaty of October 1920; insular arms control; Spitsbergen and the Aland Islands; the Lausanne convention: Demilitarization of the Thracian frontier and Aegean Islands; the Lausanne convention: The Straits, and from Lausanne to Montreaux: 1923-36.
- 0391 **Disarmament in Perspective: An Analysis of Selected Arms Control and Disarmament Agreements between the World Wars, 1919-1939. Volume III. Limitation of Sea Power.**
California State College Foundation, Los Angeles. Richard Dean Burns, Donald Urquidi, Arthur L. Smith, Jr., and Seymour Chapin. July 1968. 289pp.
Contents: The Washington Naval Treaty, 1922; the Contemporary Verdict, 1922-27; the London Naval Treaty, 1930; the negotiations; the London Naval Treaty, 1930; assessment of naval limitation on the Mediterranean, Aegean and Black Seas; Anglo-German Naval Pact, 1935; the London Naval Treaty, 1936; and bilateral accessions, 1937-38, and Supervision and Control of the Washington Naval System, 1922-41.
- 0680 **Disarmament in Perspective: An Analysis of Selected Arms Control and Disarmament Agreements between the World Wars, 1919-1939. Volume IV. Conclusions.**
California State College Foundation, Los Angeles. July 1968. 36pp.
Contents: Origins of arms control proposals, the negotiatory progress, verification and control, compliance and revision, and arms control and security.

- 0716 **Superpower Strategic Postures for a Multipolar World.**
Rand Corp., Santa Monica, Calif. Malcolm W. Hoag. October 1969. 27pp.
The report attempts to predict the extent and character of long-run nuclear proliferation, and to prescribe policy measures that are designed to affect proliferation and resultant multipolar power relationships.
- 0743 **Limiting Damage from Nuclear War.**
Rand Corp., Santa Monica, Calif. October 1969. 101pp.
Based on the current concept that nuclear attack would occur only after an international crisis, thus providing from several days to several months of strategic warning, this study maintains that damage-limiting systems can be designed that would reduce present estimates of about 100 million fatalities by 90 percent. Two extreme programs are considered: a "cheap" program based on urban evacuation and improvised fallout shelters, and an "expensive" program based on urban blast shelters and active defense.
- 0844 **The Postattack Viability of American Institutions.**
Rand Corp., Santa Monica, Calif. William M. Brown. January 1970. 28pp.
The paper delineates a set of crucial problems which are apt to develop if a nuclear war collapsed the federal government as an authoritative presence and then discusses some problems that might be insurmountable even if the federal government survived. The first set represents the threat to viability that would come from the dependence on the suddenly missing hand of the federal government; the second because the hand would not be sufficiently skilled at or aware of its vital postattack functions.
- 0872 **Transattack Environment Scenarios.**
Urs Research Co., Palo Alto, Calif. Robert A. Harker. January 1970. 60pp.
This report presents emergency operations attack scenarios for New Orleans and Detroit. These scenarios indicate the responses within the cities to environmental changes which would occur during the first six hours after the receipt of attack warning. Also, there is description of the background research for the transattack environment simulation which was presented to New Orleans government officials. An analysis of the applicability of this research work to OCD's Emergency Operations Simulation Training program is also included.
- 0932 **A Study of National Travel Requirements for Strategic Evacuation.**
Institute for Defense Analyses, Program Analysis Div., Arlington, Va. Leo A. Schmidt. March 1970. 59pp.
Calculations are made of the travel requirements from large urban centers to rural reception areas under the assumption that a reception area can house four times its normal population. The New York and Los Angeles areas required large travel distances; however, for the remainder of the country, average travel distances of about 60 miles are indicated. The computer results for evacuating the Detroit area were studied in more detail as an example of the nationwide calculations. The pattern of reception centers appeared consistent with the regional areas defined by the Office of Business Economics of the Department of Commerce. The size of these regional areas appeared appropriate as a basis for evacuation planning as well as for postattack assistance to major centers. The most critical deficiency found, besides a lack of adequate regional planning, was a lack of fallout shelters in rural areas to house the evacuated population.
- 0991 **Nonproliferation Treaty Safeguards and the Spread of Nuclear Technology.**
Rand Corp., Santa Monica, Calif. V. Gilinsky, and W. Hoehn. May 1970. 44pp.
Present U.S. policy on preventing the further spread of nuclear weapons accords a major role to international safeguards on civilian nuclear facilities, particularly safeguards administered by the International Atomic Energy Agency (IAEA), whose object is to ensure that no nonnuclear weapons state can secretly divert its civilian nuclear materials and facilities to military purposes. Article III of the Non-Proliferation Treaty (NPT) requires nonnuclear parties to the treaty to begin negotia-

tions with the IAEA on safeguards by September 1, 1970; the treaty safeguards must be in effect by March 1972. The authors of this report argue that antiproliferation efforts may be most effective when directed at inhibiting the preconditions for rapid development of nuclear weapons programs.

- 1035 **Impact of Economic and Technological Issues on the Soviet Approach to SALT.**
Rand Corp., Santa Monica, Calif. Thomas W. Wolfe. June 1970. 37pp.
The document concerns the impact of economic and technological factors upon the Soviet Union's approach to arms control, plus a number of interrelated questions which seem to be of pivotal significance with regard to foreign and defense policy trends in the Soviet Union, and which may thus merit attention in the context of the negotiations taking place in Vienna.

Reel II

- 0001 **Everyday Civil Defense in the U.S.A. (A Comparison of the U.S.A. and U.S.S.R. Preparedness).**
Army War College, Carlisle Barracks, Pa. Leonard N. Arroyo. September 1970. 31pp.
The essay compares the U.S. preparedness with that of the Union of Soviet Socialist Republics (U.S.S.R.) by presenting the shelter situation and public education in both countries. This essay points out that U.S. is behind U.S.S.R. in these two areas of civil defense. The study includes recommendations to improve civilian knowledge and civilian protection in U.S. with the idea in mind of reducing the number of casualties in case of a massive nuclear attack.
- 0032 **Potential Vulnerabilities Affecting National Survival.**
Stanford Research Institute, Menlo Park, Calif. Richard L. Goen, Richard B. Bothun and Frank E. Walker. September 1970. 194pp.
This report continues a study of selected problem areas related to national survival and recovery after nuclear attack. The vulnerability of important manufacturing industries if directly attacked is analyzed, and the number of weapons required to reduce the industries to any level is derived. The vulnerability of petroleum product pipelines to direct attack is also considered, and the capabilities of rail tank cars and tank trucks to replace the pipelines is determined. Location patterns of electric-power-generating stations, the capabilities for transmission of power between power supply areas, and postattack power requirements are examined. The relocation of homeless survivors, and the availability of housing within various distances of the large metropolitan areas are analyzed, taking account of dose-rate constraints on use of the housing.
- 0026 **Nuclear Emergency Operations Planning at the Operating Zone Level.**
Stanford Research Institute, Menlo Park, Calif. Charles T. Rainey. October 1970. 54pp.
The study was concerned with the development of a prototype Nuclear Emergency Operations Plan for local jurisdictions of less than 25 square miles and for operating zones within larger jurisdictions. The emergency period considered begins with the onset of a crisis, includes the warning and attack phases, and continues until weapon-caused fires, if any, are out and fallout radiation, if any, no longer constitutes a substantial hazard. The prototype zonal NEOP consists of three parts. The first is the basic plan of the local government within which the zone is located. The second is a master checklist of preplanned actions. This checklist is based on the dynamics of the principal threats (direct effects and fallout) posed by nuclear weapons. All operating zones would use the same checklist except that those zones unlikely to experience direct weapons effects would require the fallout portions only. The third part contains service annexes that detail the plans for accomplishment of emergency actions within a given zone.

- 0280 **Petroleum Distribution, Gross National Product, and System Vulnerability: Methods of Analysis.**
Checchi and Co., Washington, D.C. Robert P. Manly, Harvey A. Lerner, and J. William Grigsby. October 1970. 123pp.
 The purpose of the report is to develop improved methods, techniques, and technical information for analyzing the effects of nuclear attack on distribution systems in the U.S. The report represents a bridge between previous studies of the vulnerability of local petroleum distribution systems and analyses of a broader range of economic, geographical, and system parameters. Principal attention is given to four areas of analysis which are appropriate to broader concepts of vulnerability: gross national product analysis, national needs analysis, spatial interaction analysis, and network-boundary flow analysis.
- 0403 **Acceptable Limitations in Strategic Weapons.**
Army War College, Carlisle Barracks, Pa. N.F. Stein. December 1970. 68pp.
 Contents: U.S. nuclear strategy; the strategic threat; options for arms limitation.
- 0471 **Proceedings of the Interdisciplinary Conference on Selected Effects of a General War (3rd), held at Princeton, N.J., on March 20, 1968. Volume III.**
General Electric Co., Santa Barbara, Calif. DASA Information and Analysis Center. Austin M. Brues, and Arthur C. Upton. January 1971. 647pp.
 The report is a result of a third conference held in March 1968 on the selected effects of a general war. Specific topics included in the conference were the behavior of populations in disaster and the effects of widespread or local thermonuclear attacks on the U.S.

Reel III

- 0001 **One American Perspective on Nuclear Guarantees, Proliferation, and Related Alliance Diplomacy.**
Rand Corp., Santa Monica, Calif. Malcolm W. Hoag. February 1971. 31pp.
 Contents: The American consensus—why; responsible custodianship for mankind; what strategic doctrine for responsible custody?; competing strategic doctrines; what strategic doctrine for nuclear guarantee?; what implications for allies?
- 0032 **Theory of Deterrence and Dissuasion.**
Office of Research Analyses, Holloman AFB, N. Mex. Bruno J. Manz. February 1971. 28pp.
 A theory is developed within the wider probabilistic theory of international nuclear stability to establish the probabilities of various types of nuclear missile wars between two opponents as functions of damage and certain psycho-political parameters. The report is concerned with a spontaneous belligerency function of the two opponents. A theory is presented which generates the probability that either power will attack spontaneously as a function of appropriate damages and four psycho-political parameters, viz., the aggressiveness parameters and the standards of damage of both powers. It is always endeavored to derive the probabilities logically from certain clearly exposed principles which form the postulatory basis for the theory.
- 0060 **Civil Defense—Its Role in Nuclear Deterrence.**
Army War College, Carlisle Barracks, Pa. Richard E. Leonard. February 1971. 45pp.
 Contents: Civil defense in historical perspective; civil defense in nuclear targeting strategies; civil defense and arms control.
- 0105 **National Entity Survival: Measure and Countermeasure.**
Stanford Research Institute, Menlo Park, Calif. Richard K. Laurino, and Francis W. Dresch. July 1971. 123pp.
 The report provides a comprehensive review of the national entity survival studies

with respect to possible methods to calibrate national survival levels in view of various levels of resource losses due to attack and to the use and need for alternative countermeasures. The report defines various levels of U.S. viability in which postattack concepts of operation would fundamentally differ, and describes general conditions under which expedient measures are most useful. Conditions for effective advanced planning for postattack recovery are discussed.

0228 **Recovery from a Nuclear Attack. (A Study Based upon a Hypothetical 1973 War Scenario).**

Brown (William M.), Topanga, Calif. William M. Brown. October 1971. 77pp.

The analysis of postattack recovery problems is approached by means of a 1973 nuclear war scenario which depicts a preattack crisis of several months duration, an urban evacuation, a large Soviet nuclear attack before the evacuation is completed, a calculation of the casualties, and a discussion of the critical problems at two weeks and at three months postattack. The factors found to affect the recovery most strongly are: (1) the survivability of the federal government; (2) the nature of the preattack civil defense plans, and (3) the civilian responses during the preattack crisis. In this scenario an incapacitation of the federal and most state governments leads to major societal changes including the political fragmentation of the nation. Competition for scarce resources leads to authoritarian community governments, riots, and inter-community conflicts as well as great inequities in the distribution of survival supplies. Some low-cost countermeasures which might reduce or prevent the more undesirable developments are suggested.

0305 **The Soviet Military Industrial Complex and Arms Control Talks.**

Army War College, Carlisle Barracks, Pa. William P. Schneider. October 1971. 27pp.

The best hope for peace is successful negotiations for arms control with the Soviets. These have been less than successful because Americans and Soviets do not understand one another's language. This peculiar understanding is based on the completely different structure of the Soviets' society and their understanding of the U.S. MIC (Military Industrial Complex). The Soviet and U.S. MICs were examined from the point of view of the U.S.S.R. and an attempt was made to show the bias of the Soviet negotiator as a result of his being reared as an integral part of a MIC. The author shows that an attempt must be made to understand the Soviet negotiators on their own terms rather than in terms of U.S. society.

0332 **The Implications for Arms Control of Perceptions of Strategic Weapons Systems. Volume I: Summary.**

University of Pittsburgh, Pittsburgh, Pa. J.I. Coffey, and Jerome Laulich. November 1971. 17pp.

The purposes of this study were the following: to ascertain opinions prevalent among various groups in several countries concerning the political, psychological, economic, sociological, and scientific and technological values and costs of strategic weapons systems; to assess the implications of these views for the acceptability of measures to limit or reduce strategic offensive and defensive weapons, and to explore the feasibility of an in-depth study of Soviet perceptions of the value and costs of strategic weapons systems.

0349 **The Implications for Arms Control of Perceptions of Strategic Weapons Systems. Volume II: Literature Survey.**

University of Pittsburgh, Pittsburgh, Pa. Jerome Laulich, and J.I. Coffey. November 1971. 59pp.

The authors discuss the following: examine the data to see whether the authors evaluated strategic weapons systems as valuable or costly. See into what categories (economic, political, psychological, sociological, or scientific and technological) the authors' evaluations fell; see how the values or costs of strategic weapons systems are seen to affect the foreign policy, the domestic and the international environments; discuss the important findings with respect to specific attributes in each of these categories, significant either because they were mentioned frequently or hardly at all, and, finally, examine views on weapons systems according to the

nationality of the author and the country being discussed, with particular reference to the views of U.S. and Soviet authors.

- 0408 **The Implications for Arms Control of Perceptions of Strategic Weapons Systems. Volume III: Study of Soviet Perceptions.**
University of Pittsburgh, Pittsburgh, Pa. Steven J. Rosen, and J.I. Coffey. November 1971. 19pp.
The purpose of this task, as defined in the contract, is to "make a brief survey of what is known of Soviet perceptions of values and costs of strategic weapons systems and explore the feasibility of an in-depth study of Soviet perception in this area in terms of methodology, personnel, cost."
- 0427 **The Implications for Arms Control of Perceptions of Strategic Weapons Systems. Volume IV: Interviews with Experts.**
University of Pittsburgh, Pittsburgh, Pa. Jerome Laulicht. November 1971. 15pp.
This part of the project called for interviewing present or former U.S. government officials associated with weapons systems development and deployment and experts in this area to determine their views about the costs and values of strategic weapons systems. This task, a modification of the agency's original terms of reference, was undertaken because a number of specific issues under study could not be adequately assessed without obtaining some original data. The only feasible way to partially fill this gap was to interview people similar to those whose publications were analyzed, asking the kinds of questions which we would have liked to ask of the writers, had they been present.
- 0442 **The Implications for Arms Control of Perceptions of Strategic Weapons Systems. Volume V: Polling Data.**
University of Pittsburgh, Pittsburgh, Pa. Jerome Laulicht. November 1971. 39pp.
The goal was to uncover "perceptions of the political, economic, sociological, and psychological" values and costs of strategic weapons systems. The focus was on "the views of various socioeconomic-political groups in the U.S., France, West Germany, and Japan, groups which are not experts on weapons systems and strategic concepts." The original aim was to ascertain the relevant perceptions of the general public, as well as of such possible groups as national elites, business and professional men, academicians, government officials, union leaders and members, and farmers. A second aim was to assess changes (or lack of changes) in the perceptions of these groups over a five-to-ten-year period, and to correlate such changes with perturbations in the international environment, to the extent that this was feasible. These inputs, together with those from other research, were to be used to assess the implications of these perceptions for arms control—the overall purpose of the study.
- 0481 **The Implications for Arms Control of Perceptions of Strategic Weapons Systems. Volume VI: Index.**
University of Pittsburgh, Pittsburgh, Pa. Dorothea Carpenter. November 1971. 9pp.
The report contains an index of terms used throughout the survey.
- 0490 **A Countercombatant Deterrent. Feasibility, Morality, and Arms Control.**
Yale University, New Haven, Conn., Dept. of Political Science. Bruce M. Russett. 1972. 42pp.
The paper explores a proposed alternative deterrent strategy to contemporary counter-city nuclear targeting. It proposes concentration on military (conventional as well as nuclear) and military-industrial targets, with care to avoid large numbers of civilian casualties. It depends for its effectiveness primarily on reducing Soviet capacity to fight a conventional war, especially vis-à-vis China and Eastern Europe, contending that this is as effective a deterrent as is a threat to the Soviet population. The proposal is related to certain frequently raised ethical arguments, and a number of implications for arms control are spelled out.

- 0532 **Arms Control and the Military.**
Army War College, Carlisle Barracks, Pa. George L. Egbert, Jr. February 1972. 52pp.
Contents: Historical perspectives; arms for deterrence; the strategic balance; arms control—a new definition; the military role; organization for arms control.
- 0584 **The Strategy of Nuclear War.**
Army War College, Carlisle Barracks, Pa. Edwin D. Patterson. February 1972. 47pp.
The U.S. strategy for nuclear war is reviewed on a historical basis from the end of World War II to present. This evolution begins with the strategy of finite deterrence, passes through the counterforce targeting concept to the present strategy of assured destruction/damage limiting. Available nuclear forces have had the major thrust in shaping U.S. strategy, both during the period of U.S. nuclear superiority and after the Soviet Union became a nuclear power. The impact of weapons on stability between the great powers is analyzed as is the proper mix of offensive and defensive weapons. Among the several issues involved in the present strategy, parity versus superiority, sufficiency, balance of terror, and the nuclear umbrella are analyzed in detail. Looking to the future, the potential impact of strategic arms limitation is reviewed in the light of the Nixon doctrine of realistic deterrence.
- 0631 **Alternative Nuclear Strategies.**
Army War College, Carlisle Barracks, Pa. Ronald A. Roberge. February 1972. 66pp.
As the U.S. finds itself in confrontation with the Soviet Union there is a need to establish a national strategy that will contribute to our defense and allow us to continue to play a role in resolving issues and problems that face the nations.
- 0697 **An Analysis of Assured Destruction.**
Hudson Institute Inc., Croton-on-Hudson, N.Y. Edward S. Boylan, Donald G. Brennan, and Herman Kahn. March 1972. 28pp.
The belief that the U.S. must retain an "assured destruction" capability to be able to destroy some fixed percentage of Soviet citizenry and industrial capacity, even after absorbing a Soviet nuclear first strike, is the cornerstone of American strategic policy, both at present and in the mid-to-late 1960s. Arguments for and against the desirability of basing U.S. strategic policy upon retention of an "assured destruction" capability are given. A large number of questions are given from proponents and opponents.
- 0725 **Alternatives to Assured Destruction.**
Hudson Institute Inc., Croton-on-Hudson, N.Y. Edward S. Boylan, Donald G. Brennan, and Herman Kahn. March 1972. 41pp.
A previous paper, "An Analysis of Assured Destruction", presented arguments for and against basing U.S. strategic policy upon retention of an assured destruction capability. This paper presents a number of alternative strategic postures and presents the arguments for and against each of them. As in the earlier paper, a large number of quotations from relevant sources are given.
- 0766 **The Nuclear Missile and Its Destructive Effect.**
Foreign Technology Div., Wright-Patterson AFB, Ohio. A.I. Ivanov, I.A. Naumenko, and M.P. Pavlov. November 1972. 269pp.
The report contains discussions of the physical principles and design of the nuclear rocket weapon and its destructive effect. The book presents data concerning the design of atomic and thermonuclear munitions and rocket carriers, concerning methods of calculating the destruction zone and protective measures against nuclear missile attack. The plans for the use by imperialists of space war is discussed. The destructive effect of atomic explosions in space is outlined. The material for the book is drawn from unclassified Soviet and foreign materials.

Reel IV

- 0001 **The Limitation of Naval General Purpose Forces in Historical Perspective.**
Naval War College, Newport, R.I. Christos Zirps. February 1973. 350pp.
This study reviews the naval arms limitations conferences and proposals since the Hague Conference of 1899 and points out the pitfalls which can result from being too willing to negotiate in search of accommodation or peace without due regard for both political and strategic factors. This study also looks at the newly emerging multipolar world and how the Nixon Doctrine has affected these new power centers and created a need for armaments rather than reductions in armaments. The perceived need for security by these emergent powers has led them to turn to the sea and acquire sizable navies throughout the world to protect their national interests and sea lines of communication. This naval build-up could very well trigger a naval arms race and lead to naval arms limitations negotiations, at least regionally. Lastly, this study discusses historic and geographic factors which have caused the two superpowers, the U.S. and the Soviet Union, to build large navies. The study further compares the probable aims of these two powers in possible future naval limitations negotiations from the standpoint of the needs of a land power versus a sea power.
- 0351 **International Negotiations on the Seabed Arms Control Treaty.**
Arms Control and Disarmament Agency, Washington, D.C. Robert W. Lambert, and John W. Syphax. May 1973. 229pp.
The paper is a historical review of the negotiations that led to the conclusion of the Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and the Ocean Floor and the Subsoil Thereof that opened for signature at Washington, London, and Moscow on February 11, 1971. It is based on the records of international conferences, the United Nations, and other public documents. Abbreviations are explained in a separate list.
- 0580 **Tactical Nuclear Weapons: Deterrent or Detriment (1). Inevitable: A Comprehensive Test Ban Treaty (2).**
Army War College, Carlisle Barracks, Pa. Joseph P. Franklin. June 1973. 81pp.
The report discusses the benefits and drawbacks of a tactical nuclear capability and suggests that the judgment of the military, the war-fighting experts, should be used in implementing programs to maintain war-fighting capability. The report also discusses the nature of an eventual test ban codified in the Limited Test Ban Treaty and Nuclear Non-Proliferation Treaty. The discussion touches on the pressures for the nuclear nations to stop testing, the problems of nuclear proliferation, and agreements to a ban on nuclear testing, as well as the asymmetries between the nuclear programs of the U.S. and U.S.S.R.
- 0661 **Credible Deterrence in a SALT Environment.**
Army War College, Carlisle Barracks, Pa. William M. Williams, Jr. September 1973. 27pp.
Two questions arise from the SALT agreements: How do they affect the "sufficiency" theory, and what would be a credible deterrence under these agreements. The flaws of the SALT agreements have been examined in light of U.S. deterrent strength. The U.S. "nuclear sufficiency" theory is examined under the current SALT agreements. The author's recommendations are in two parts. The first is on a credible deterrence under the SALT agreements, and is basically continued development and deployment of those weapons systems allowed under the agreements. The second recommendation concerns the current SALT II talks. Here, consideration should be given for U.S. allies, no give in to the Soviets for the sake of arms control headlines, and the U.S. must have a credible deterrence and an indication of the will to use it if the need arises.
- 0688 **U.S. Strategic Nuclear Weapons Policy—Do We Have One? Should There Be One?**
Rand Corp., Santa Monica, Calif. S.T. Cohen. November 1973. 29pp.
Contents: Who determines U.S. strategic nuclear policy? How can U.S. strategic forces be used? What kinds of strategic forces should the U.S. have?

- 0717 **Compilation of Soviet Views on MBFR to January 31, 1973.**
Stanford Research Institute, Menlo Park, Calif., Strategic Studies Center. Harriet Fast Scott. December 1973. 67pp.
 The paper brings together open-source Soviet statements—official, informal, and semiofficial—concerning reductions of armed forces and armaments in Europe, or Mutual Balanced Force Reductions (MBFR), as the West calls it. The paper covers the period up to the start of preliminary talks on January 31, 1973. More specifically, the paper covers the problem of asymmetry, the “geographical” factor, Soviet proposals to NATO and the Warsaw Pact, participation at the talks, linkage with the Conference on Security and Cooperation in Europe (CSCE), timing, and implications of the Nixon Doctrine. An attempt has been made to synthesize the Soviet position and that of the Warsaw Pact on MBFR negotiations.
- 0784 **Possible Patterns of Nuclear Proliferation.**
Stanford Research Institute, Strategic Studies Center, Arlington, Va. Harold W. Rood, and Barbara N. McLennan. April 1974. 81pp.
 The report examines six potential nuclear powers and suggests how their peculiar situations might be affected by their acquisition of nuclear weapons. The study indicates some effects of nuclear proliferations under a variety of circumstances. The implications of proliferation to be considered in the formulation of defense policy and force structures are discussed.
- 0865 **Questions about the Arms Race: Who’s Racing Whom? A Bureaucratic Perspective.**
John F. Kennedy School of Government, Public Policy Program, Cambridge, Mass. Graham T. Allison. 17pp.
 The report focuses exclusively on American and Western thinking about the arms race and strategic arms limitation. Questions are raised regarding the accepted account of how U.S. and Soviet strategic forces interact. Several examples of the accepted answer to this question are presented. In particular, arms race analysts have identified MIRVs (multiple independently targeted reentry vehicles) as a U.S. reaction to Soviet ABM. Five general questions are posed about the interaction between U.S. and Soviet strategic forces. Episodes from MIRV’s development and deployment provide partial answers to each question. Because MIRV is single weapons system, examined on the basis of limited public sources from one side of the arms race, this case yields few definite conclusions. However, certain characteristic difficulties to the prevailing action-reaction hypothesis are certified. Some conclusions are drawn about the arms race, and tentative implications on this argument for strategic arms limitations are spelled out.
- 0892 **National Warning System Analysis.**
System Development Corp., Santa Monica, Calif. Murray Rosenthal. May 1974. 301pp.
 The report reviews the nation’s civil preparedness warning system. The project analyzed and evaluated: (1) the present operational configuration of the National Warning System (NAWAS), as well as state and local warning systems; (2) needed updating and/or changes in the National Warning Centers’ operational concepts and procedures; (3) the role of NAWAS, with a nationwide implementation of the Decision Information Distribution System (DIDS) and during DIDS implementation stages; (4) the potential use of cable television for all types of warning; and (5) low-cost means of developing internal public warning in the metropolitan areas to supplement outdoor systems by taking advantage of existing communications and media outlets, including Crisis Home Alerting Technique (CHAT).

Reel V

- 0001 **The U.S./Soviet Arms Competition: Quantitative/Qualitative Aspects.**
National War College, Strategic Research Group, Washington, DC. Richard M. Jennings. July 1974. 34pp.
 The study seeks to give decision-makers an unclassified analysis of the nature and

intensity of U.S./Soviet arms competition since World War II and to point out implications for future national security policy. The study places emphasis on the overall indicators of the race and strategic nuclear arms. Scholars have concluded that a quantitative arms race usually leads to war, but a qualitative one does not. The study sets up operational definitions for these type races, and tests the U.S./Soviet case by charting trends in military personnel, nuclear arms, defense expenditures and fear/hostility.

- 0035 **U.S./Soviet Arms, 1945-1973: Questions of Cycles, Symmetries, and Balance.**
National War College, Strategic Research Group, Washington, DC. Richard M. Jennings. August 1974. 29pp.
The study examines the U.S./Soviet arms relationship by tracing the levels and qualitative changes of force components through the years. Granting the limitations of working with unclassified Western estimates of Soviet forces and of condensing information that would fill several catalogues, it proceeds on the basis that at least a clearer picture may emerge and some myths may be disposed of. Whereas most works on the U.S./Soviet arms race treat only strategic nuclear arms, this analysis also includes tactical nuclear weapons and general purpose forces.
- 0064 **The Implications of SALT Agreements in the 1970s.**
Army War College, Carlisle Barracks, Pa. Charles L. Brindel. September 1974. 22pp.
The implications of SALT agreements for this decade are looked at in the light of what has transpired to date, beginning with the end of World War II.
- 0086 **Strategic Arms Interactions: 1945-1961.**
Naval Postgraduate School, Monterey, Calif. Joseph W. Hood, Jr., and William E. Terry. September 1974. 124pp.
Throughout the period 1945-1961 the Soviet Union was strategically inferior to the U.S. The Soviets sought to redress this imbalance, and the U.S. endeavored to remain superior. An examination is made of each major strategic arms innovation, in context, to determine its relationship to the action/reaction process. No single pattern of interaction is recognized, but one unmistakable characteristic does emerge. The U.S. consistently reacted strongly even when enjoying a decisive weapons margin if a threat were perceived to its strategic superiority.
- 0210 **A Quantitative Study of the Strategic Arms Race in the Missile Age: Preliminary Analyses.**
Institute for Defense Analyses, Program Analysis Div., Arlington, Va. Martin McGuire. November 1974. 48pp.
The study has assembled data on the inventories of strategic weapons held by the U.S. and the U.S.S.R. over the period 1960-74 and has calculated alternative indexes of strategic strength.
- 0258 **The SALT Agreement—No More War.**
Army War College, Carlisle Barracks, Pa. Marvin E. Lackey. November 1974. 32pp.
The study examines the SALT agreement and its destabilizing influence in the balance of power between the U.S. and the U.S.S.R. The research and analysis was limited primarily to the SALT agreement and its impact on strategic military use by the two superpowers.
- 0290 **Industrial Preparedness in an Arms Control Environment; a Study of the Potential Impact of Sharp Increases in Military Procurement. Volume II.**
Little (Arthur D.) Inc., Cambridge, Mass. December 1974. 75pp.
To be viable in the long run, an arms control agreement—like any other international agreement—has to be in the interest of all the major parties. If it is indeed in the interest of the major parties, this fact alone should suffice to prevent abrogations or violations. Since arms control agreements are so basic to national security, however, we have consistently sought additional assurances to make them possible, in the first instance, and viable later on. In particular, we have insisted upon adequate verification, to assure ourselves that the terms are being lived up to. In evaluating the feasibility of an arms control agreement, we have also given full consideration to the

consequences which would be suffered by another party if it chose to violate or abrogate. Such consequences might be political, economic, military, or some combination of these. The prospect of adverse consequences obviously promotes arms control, making possible arms control measures which otherwise might not seem feasible. An important deterrent to abrogation or violation of an arms control agreement is our known ability to redress a sudden military imbalance rapidly if the need should occur. With this in mind, the Arms Control and Disarmament Agency contracted for a study to be made which would evaluate the U.S. capability to respond to military threats without having to maintain American military capability at peak level.

- 0365 **Crisis Relocation: Perspectives of Americans.**
University of Pittsburgh, Department of Sociology, Pittsburgh, Pa. Jiri Nehnevajsa. January 1975. 23pp.
The study assesses the desirability of feasibility studies of population evacuation. Among the major factors affecting feasibility, public acceptance of relocation concepts must rank high. Four national attitudinal surveys concluded during the past year give significant evidence of how different population segments view the desirability of an evacuation program. The data support the conclusion that crisis relocation planning is acceptable to most Americans, and that the sentiments revealed in the national studies establish supportive, though passive, attitudes which make it altogether possible to proceed both with feasibility assessments, and in terms of acceptability, with actual planning.
- 0388 **Study of Controlled Conflict.**
Caci Inc.—Federal, Arlington, Va. February 1975. 242pp.
The study results are contained in two volumes. This volume contains all technical analyses and recommendations. This volume contains four chapters, each develops in sequence a theme that is likely to be important in a controlled conflict environment. Chapter 1 describes the concept of controlled conflict, identifies its characteristics, and compares controlled conflict with other forms of nuclear war. Chapter 2 takes the preparedness functions of a controlled conflict environment as a basis for analysis. Chapter 3 describes the role of analysis in decision-making and the characteristics of useful analytic strategies, gives specific examples of analytic routines that may be useful in preparedness planning and coordination for controlled conflict, and describes the requisites of an information management system that should prove of great value in meeting preparedness planning and coordination functions. Chapter 4 explores the effects of a controlled conflict environment on the present structure of civil preparedness in the U.S.
- 0630 **A Quantitative Study of Controlled Flexible Response and the U.S. Military.**
Naval Postgraduate School, Monterey, Calif. Joseph Albert Hanzel, Jr. March 1975. 82pp.
Controlled Flexible Response is a nuclear deterrence strategy that is being implemented as part of the U.S.'s deterrence strategy. That strategy is explored and questions concerning its viability are discussed. The role of options and the necessity of knowing the military's perceptions and values concerning these options is discussed. A quantitative methodology is developed to define the military's position in regards to Controlled Flexible Response. Variables are defined, quantified, and analyzed. The results of the survey of the military's values and perceptions concerning nuclear deterrence strategies are presented.
- 0715 **U.S. Strategic Doctrine and the Development of Command and Control Systems.**
Air Force Institute of Technology, Wright-Patterson AFB, Ohio. Frank G. Klotz. April 1975. 168pp.
This study identifies and discusses the broad categories of command and control functions which are generally considered to be necessary for the implementation of a highly selective nuclear strategy. These include tactical warning, attack assessment, and the specific direction of particular elements of the strategic nuclear forces. Then, the command and control systems capable, to some extent, of performing these functions are identified and discussed, with particular reference to the rationales which underlay the original decisions for their respective development.

Reel VI

- 0001 **Study of Controlled Conflict—Possibilities and Implications of a Soviet Adoption of Controlled Conflict.**
Stanford Research Institute, Strategic Studies Center, Menlo Park, Calif. June 1975. 135pp.
The report presents an analysis of the likelihood of the Soviet Union developing a limited strategic concept within its overall strategy. The concept has been termed *Controlled Conflict*. The report presents an analysis of likely responses the Soviets would make to a U.S. limited strategic attack. The analyses are based on the strategic history of the Soviet Union, the capabilities of their weapons systems, and their ideological and institutional predispositions. The time frame of the study covers the period 1974 to 1985.
- 0136 **The Effects of Nuclear Weapons on Post-WW II U.S./U.S.S.R. Confrontations Intensity Peak Levels.**
Army Command and General Staff College, Fort Leavenworth, Kans. Robert F. Helms II. June 1975. 224pp.
The study examines the escalation rates and intensity levels of U.S./U.S.S.R. post-WW II confrontations in relation to the number of strategic nuclear weapons available to these nations to determine if a relationship exists, that is, have strategic nuclear weapons effected the rate of escalation or peak level of intensity of the post-WW II U.S./U.S.S.R. confrontations? The study concludes that, while the role of strategic nuclear weapons has been insignificant in effecting either the intensity level or escalation rate of U.S./U.S.S.R. confrontations, strategic nuclear weapons are an important factor in the pursuit of confrontation avoidance politics by the U.S. and U.S.S.R. since 1962.
- 0360 **The Nuclear Weapons Capabilities Required to Support the Military and Political Uses of Nuclear Weapons Envisioned by Selected Civilian Strategic Thinkers.**
Army Command and General Staff College, Fort Leavenworth, Kans. Loren G. Lundquist. June 1975. 41pp.
A literature search, focused on the works of civilian strategic thinkers, revealed 20 distinct nuclear weapon roles. The roles included military and political uses which fell into categories of strategic offensive, strategic defensive, and tactical use. The roles were not all compatible with each other. An analysis of these roles identified 40 distinct nuclear weapon capabilities, each of which was necessary to support one or more of the roles. A matrix was developed which provides a weighted correlation for each of the 800 role-capability combinations. The weighting was in seven increments which ranged from the capability being mandatory if the role was to be supported, to the capability not being allowed if the role was to be supported. Few of the capabilities had a positive correlation to a high percentage of the roles. The capabilities of delivery accuracy, of affordability, and that the weapon actually be in existence (deployed and combat ready) prior to commencement of hostilities had the highest percentages of positive correlation.
- 0401 **The Future of Conventional Arms Control.**
Rand Corp., Santa Monica, Calif. James L. Foster. August 1975. 30pp.
Dramatic changes in conventional military capabilities coupled with nuclear parity should greatly increase the importance of conventional military power as well as raise new opportunities and problems for arms control. Those changes are not yet widely appreciated and, in fact, there is a lack of analytic tools by which to appraise their implications and importance. As an initial step to systematic analysis of the desirability and feasibility of conventional arms control agreements, this paper describes current trends in weapons development and evaluates interpretations. The requirements of effective and reliable arms control agreements are then enumerated and a general assessment made of the difficulties in meeting those requirements.

- 0431 **The Nuclear Triad. A Proposal for an Economy of Force.**
Army War College, Carlisle Barracks, Pa. Donald G. Blutworth. September 1975. 29pp.
 The problem faced by defense force structure planners in the next decade is to reconcile defense needs with the availability of defense dollars. The purpose of this proposal for an economy of force for strategic nuclear forces is to assist in this reconciliation. The scope of the problem was limited to the Nuclear Triad. Each component of the Nuclear Triad was examined as an alternative to the Triad. It was concluded that (1) the Nuclear Triad should be retained since no single component will meet the stated requirements for nuclear deterrence; (2) the overall force levels of the Triad are in excess of stated needs, and (3) the proposal for an economy of force will provide an adequate nuclear deterrent. It is recommended that the Ford administration adopt the proposal to reduce the Nuclear Triad to a level of 250 ICBMs, 240 SLBMs and 200 bombers.
- 0460 **The Nuclear Crisis of 1979.**
Brown (William M.), Croton-on-Hudson, NY. William M. Brown. September 1975. 69pp.
 This study is based on a hypothetical series of strategic events which lead to a very intense nuclear crisis during the summer of 1979. A parallel civil defense scenario sketches the U.S. civilian responses including an evacuation of the high risk areas. The response is part of a low-budget civil defense option requiring a rapid civilian mobilization over several weeks. Survival and recovery projects are found to depend strongly on timely federal policies during the growing crisis. The aftermath of the crisis is analyzed for two outcomes: one which resolves the crisis peacefully and one which involves a large scale nuclear attack.
- 0529 **Nuclear Strategy for Defending a Border.**
Army War College, Carlisle Barracks, Pa. John F. Scott. October 1975. 25pp.
 The study deals with the dilemma of using nuclear weapons with restraint to convey incentives to a nuclear opponent to terminate war, while recognizing that the nuclear use may be an incentive to escalate or otherwise continue a war. Analysis centers on the choice of how much nuclear force to use, when, and why. Offered as critical variables are possible aggressor motivations and the possibility of unintended war and crisis. The paper concludes that any nuclear deterrence strategy can have the potential for its own failure primarily by ignoring requirements to encourage stability in crises rather than preventive or reemptive war. A strong conventional defense option in Europe is seen as still necessary for deterrence with stability.
- 0554 **Controlled Nuclear Conflict and Civil Preparedness: An Introductory Overview.**
Federal Preparedness Agency, Washington, DC. October 1975. 29pp.
 The purpose of the study is to introduce members of the civil preparedness community to the work of the Controlled Conflict Preparedness Division and to outline the essentials of the new concept with its very important civil preparedness implications.
- 0583 **Development of Master Checklist for Planning Nuclear Defense Operations.**
Center for Planning and Research Inc., Palo Alto, Calif. Charles T. Rainey, and Frederick Goshe. October 1975. 81pp.
 This report describes the development of the Master Checklist which is included as an appendix. Various studies that provided inputs are described, along with the method of approach that was used in developing the checklist. The various stages (crisis buildup, crisis relocation, transattack, and postattack) are described in order to provide an overall view of the sequence of events and the rationale of emergency actions given in the checklist.
- 0682 **History of the Strategic Arms Competition, 1945-1972. Supporting Study: U.S. Aircraft Carriers in the Strategic Role. Part I—Naval Strategy in a Period of Change: Interservice Rivalry, Strategic Interaction, and the Development of a Nuclear Attack Capability, 1945-1951.**
Lulejian and Associates Inc., Falls Church, Va. David A. Rosenberg, and Floyd D. Kennedy, Jr. October 1975. 207pp.

Partial contents: initial Navy interest in atomic weapons—concepts, tests, and technological estimates, August 1945-November 1946; threat assessments, strategic concepts, and internal dispute, December 1945-June 1948; the roles and missions controversy, 1945-1949; the strategic bombing controversy—carriers, bombers, and the war plans, 1949; airborne delivery capability; Admiral Sherman puts it all together—the planning and deployment of the Navy's first nuclear strike force, 1949-1951; the aircraft carrier in a strategic role—myth and reality; and OPNAV general organization for strategic warfare, 1945-1972.

0889 **Can the Mutual and Balanced Force Reductions (MBFR) Talks Succeed under Present Restrictions?**

Army War College, Carlisle Barracks, Pa. Lawrence R. Tassie. November 1975. 25pp. The MBFR talks have not made any significant progress since they began in October 1973. The inability to make any progress may be caused by political factors that preclude acceptance of each other's proposals. The MBFR talks are concerned with seeking solutions to military problems; however, political solutions must be reached before the military questions can be resolved. This paper reviews some of the political problems and concerns facing the opposing powers.

Reel VII

0001 **Arms Limitation and Strategic Operations—A Soviet Perspective.**

Analytic Services Inc., Falls Church, Va. Lewis Allen Frank. January 1976. 83pp. The paper was undertaken to provide some insight to U.S. research and development planners on how a typical Soviet research and development planner might go about constructing Soviet operational requirements for future Soviet strategic-nuclear forces in an Arms Limitation/Reduction (SAL) environment during the years through 1985. The paper uses an unconventional approach in that it is written as though a Soviet Ministry of Defense planner was presenting to his leadership his analysis of current weapon systems issues. The reader will note that the Soviet planner must deal not only with the realities of military technology but also with integrating and applying Marxist-Leninist dogma under currently stated CPSU objectives. This paper is based on recent information and commentary in Soviet and Western open literature.

0084 **The Issue of Forward Based Systems in Arms Control Negotiations.**

Stanford Research Institute, Strategic Studies Center, Menlo Park, Calif. William F. Lackman, Jr., and Mark E. Miller. February 1976. 52pp.

This study analyzes the role of the forward based systems (FBS) issue in Soviet negotiating strategy in the Strategic Arms Limitation Talks. It further analyzes Soviet objectives in Europe, the role of the Conference on Security and Cooperation in Europe (CSCE) and mutual balanced force reduction (MBFR), and the possibility that the U.S.S.R. may raise the FBS at the MBFR talks. Finally, it analyzes the form of such an initiative, possible West European reactions and possible U.S. options.

0136 **The LRCM: (The Long-Range Strategic Cruise Missile) Asymmetries, Deterrence and SAL (Strategic Arms Limitation).**

Naval Postgraduate School, Monterey, Calif. Darold Steven Axtman. March 1976. 236pp.

This paper examines the many factors surrounding the potential deployment of the long-range strategic cruise missile focusing on: the technical and strategic asymmetries including guidance systems, air defense forces, nuclear weapons targeting vulnerabilities and strategic weapons essential equivalence; strategic implications including the missile's impact on the strategic balance and its potential stabilizing influence on a deterrence model; and implications on strategic arms negotiations. It examines how the long-range cruise missile will add a measure of stability to the strategic deterrent balance and contribute to the restrained counterforce doctrine. The sea-launch cruise missile platform would provide a nontime sensitive reserve

weapon capable of inflicting unacceptable damage on the adversary, hence increasing the stability of deterrence.

0372 **Nuclear Theft: Real and Imagined Dangers.**

Naval Postgraduate School, Monterey, Calif. Robert Caldwell Mabry, Jr. March 1976. 143pp.

This report examines the possibility of theft of fissionable material from the U.S. nuclear power industry by nongovernmental individuals or groups. The study investigates the availability of fissionable material, vulnerable portions of the nuclear fuel cycles, weapon construction, and the regulations regarding the protection of fissionable material. The study uses a morphological approach to evaluate the capability of potential thieves by group size and classification. Possible motivations for committing nuclear theft are discussed.

0515 **Development of Strategic Air Command, 1946-1976.**

Strategic Air Command, Offutt AFB, Nebr. J.C. Hopkins. March 1976. 188pp.

The Development of Strategic Air Command, 1946-1976, provides a brief chronological account of the command's contributions to the nation's defense during this thirty-year period. For ease of reference, the same general format is used for each year; assigned resources, command leadership, organization, and operations. Three additional categories are included for selected periods of time: bombing competition, since 1949; missile competition, since 1967; and budget and financial status, since 1958. For security reasons, no statistics have been included for those types of reconnaissance aircraft currently assigned.

0703 **International Limitation of Military Expenditures: Issues and Problems.**

Rand Corp., Santa Monica, Calif. Abraham S. Becker, and Bengt-Christer Ysander. April 1976. 88pp.

This report examines three sets of problems believed to constitute the major obstacle to successful negotiation of international limitations on military expenditure (ME): (1) the measurement of ME; (2) the effect of a ME limitation (MEL) on national and international security; and (3) the verification of compliance. Discussion of the measurement problem considers in turn: the scope and content of ME through delimitation and structuring of the military sector; the valuation of resources used in the military sector; deflation of ME for price change; and international comparison of ME. A taxonomy of MEL distinguishes eight different characteristics, with two major "packages" of these characteristics used to analyze the effect of MEL on force posture and security. Discussion of the latter problem as well as that of verification stresses the tradeoff between the stringency required of a MEL and the amount and quality of information provided by participants on their military forces and outlays.

0791 **Conventional Arms Transfers and Control: Producer Restraints.**

Army War College, Carlisle Barracks, Pa. Peter M. Dawkins. May 1976. 77pp.

The study examines how to go about restraining arms transfers on the producer side. Five categories of factors which motivate producer countries to export arms are identified and analyzed. Factors which incline countries to refrain from exporting arms are also analyzed. A policy proposal is offered suggesting initiatives in certain areas.

Reel VIII

0001 **Trends in Nuclear Proliferation, 1975-1995. Projections, Problems, and Policy Options.**

Hudson Institute Inc., Croton-on-Hudson, NY. Lewis A. Dunn, and Herman Kahn. May 1976. 131pp.

This report analyzes the dimensions and problems of proliferation, focusing upon 1975-1995. Section I briefly categorizes the pressures for and the constraints upon a decision to acquire nuclear weapons by present and future candidate nuclear-

weapon countries. Section II delineates the probable scope and analyzes the dynamics of future proliferation, developing a set of alternative proliferation projects. Section III provides a more detailed characterization of the parameters of Nth-country nuclear-weapon postures and programs, concluding with a discussion of Nth-country strategic situations. Section IV identifies, categorizes, and evaluates the problems of a world of many more nuclear powers. Section V provides an overview of possible American policy options for slowing the pace and managing the problems of proliferation, and attempts to identify policy approaches warranting more detailed study.

0264 **Survival of the Relocated Population of the U.S. after a Nuclear Attack.**

Oak Ridge National Lab., Tenn. Carsten M. Haaland, Conrad V. Chester, and Eugene P. Wigner. June 1976. 207pp.

At least 190 million Americans would survive a nuclear attack of 6,600 megatons (1,444 weapons, current Soviet capability) if 90 million were evacuated from high-risk areas during the crisis period preceding the attack. This report presents solutions to problems of continuing survival of the surviving population of the U.S. in the face of threats from postattack food shortages and fallout radiation hazards. Reserves of food, transportation capacity, and fuel would survive the attack to provide more than adequate capability to feed the entire population until the first harvest after the attack.

0475 **Weapons of Mass Destruction and Protection against Them.**

Naval Intelligence Support Center, Translation Div., Washington, DC. G.A. Belykh. June 1976. 40pp.

This supplementary instruction book is intended for soldiers. It consists of two parts: (1) weapons of mass destruction and (2) protection against radioactive and chemical weapons. The first part defines the nuclear and chemical weapons of an enemy, means of delivery, extent of injuries by these weapons, defense against atomic and chemical weapons, defensive equipment, field defensive measures, and rules according to which soldiers should behave when subjected to weapons of mass destruction. The second part discusses defensive measures against radioactive and chemical weapons within a single military unit. Means of individual protection, decontamination of military personnel and weapons, and deactivation of chemical poisons are also presented. A brief description is given of devices used for the detection and identification of radioactive and chemical substances, including instructions on their use.

0515 **Measuring the Strategic Balance. Working Papers for the International Institute for Strategic Studies.**

Department of Defense, Washington, DC. Anthony H. Cordesman. June 1976. 395pp.

This report presents a range of different approaches to measuring the strategic balance, ranging from static analysis to war gaming. The handbook was developed by various experts within the Department of Defense and the U.S. national security community as an aid to members of the military studies community who do not have access to classified information. The handbook covers such subjects as: summary presentation of the balance, unclassified analytic tools and reference data for measuring the balance, relative merit of different measurement techniques, means of protecting the balance into the 1980s, new factors and technology shaping the future balance.

0910 **Industrial Survival and Recovery after Nuclear Attack. A Report to the Joint Committee on Defense Production U.S. Congress.**

Boeing Aerospace Co., Seattle, Wash. November 1976. 119pp.

The conclusions derived from the Boeing Company's analysis of the Soviet plans for civil defense and its industrial civil defense planning study are of significant concern to every American. First, the U.S.S.R. has a civil defense program that can effectively protect their industry and facilitate its rapid recovery should a nuclear war occur. Second, the Soviets can protect their work force by means of evacuation and construction of expedient shelters during the initial stages of a crisis. Although the level

of work force survival is influenced by a number of variable factors, the most important of these variables can be controlled by the Soviets rather than by the U.S. Third, the Soviets can protect their industrial machinery. This is a critical factor in postattack recovery. Tests show that even large machines, if properly protected, could survive if they were a few hundred feet from a 40-kiloton nuclear blast or 2,000 feet from a 1-megaton blast. More important, if the observed examples of industrial dispersal and separation become the pattern for a significant portion of the Soviet Union's future capital expansion, their industry would require little or no preattack hardening to survive and recover rapidly from a nuclear war.

Reel IX

- 0001 **The Role of Ambiguity in Strategic Deterrence. Part I.**
Air Force Institute of Technology, Wright-Patterson AFB, Ohio. Ronald E. Blum. 1976. 169pp.
The paper attempts to fill an existing substantive gap in the literature of strategic deterrence by presenting both theoretical analysis and a historical case study of ambiguity in deterrence threats.
- 0170 **The Role of Ambiguity in Strategic Deterrence. Part II.**
Air Force Institute of Technology, Wright-Patterson AFB, Ohio. Donald E. Blum. 1976. 145pp.
No abstract available.
- 0315 **Qualitative Constraints on Conventional Armaments: An Emerging Issue.**
Rand Corp., Santa Monica, Calif. S.J. Dudzinsky, Jr. and J. Digby. July 1976. 109pp.
The report addresses the question of whether or not qualitative constraints on conventional armaments are desirable, feasible, and acceptable ways of promoting U.S. national security objectives. Discussion centers around possible U.S.-U.S.S.R. agreements and emphasizes the arms control implications of new-generation conventional arms, which include precision-guided munitions and remotely piloted vehicles. Incentives for constraints include: (1) enhancement of U.S.-U.S.S.R. security and that of their allies; (b) prospects for resource economies; (c) elimination of catastrophic instabilities. The most restrictive form of qualitative constraints would prohibit development, testing, production, and operational deployment of weapons systems that fit into an agreed upon performance category. Combined qualitative-quantitative constraints, however, have aspects that may be more acceptable to the U.S. Over the short and medium term, it is important to consider constraints on large, traditional penetration weapons systems that are becoming more expensive and more vulnerable to precision weapons.
- 0424 **Qualitative Constraints on Conventional Armaments. Volume II. Main Report and Appendices.**
General Research Corp., Operations Analysis Div., McLean, Va. Robert A. Gessert, William W. Cover, George R. Bieber, and Michael V. McClary. July 1976. 254pp.
Recent arms control negotiations have emphasized constraints on nuclear armaments and forces and, when they have dealt with conventional armaments, have tended to focus on quantitative limitations. With rapid advances in technology, increased ability to pay for modern weapons in areas such as the Middle East, and increased availability of modern weapons for export, several conventional arms competitions have taken on distinct qualitative dimensions as well as quantitative ones. The U.S. Arms Control and Disarmament Agency therefore requested this study to: (1) review past attempts to negotiate qualitative constraints as well as quantitative; (2) examine evidence of particularly intense qualitative competition and the apparent motivations for qualitative weapons improvements; (3) investigate feasible forms of control over qualitative weapons improvements; and (4) assess U.S. security interests in supporting or promoting qualitative constraints in areas such as the NATO-Warsaw Pact balance, the Middle East, the Indian Ocean, and Latin America. The report is published in two volumes. Volume I, the summary, is a

condensation of the main report, contained in Volume II. Volume II also includes supporting appendices. References to documentary sources are omitted from the summary. Complete documentation is provided in the main report and its appendices.

0691 Nuclear Responsibility and Nuclear Trade: International Rules and Institutions to Manage Nuclear Fuel Cycles.

Rand Corp., Santa Monica, Calif. William R. Harris. January 1977. 46pp.

Unlike diffusion of earlier weapons as by-products of trade, the diffusion of nuclear weapons and nuclear wastes as by-products of nuclear-electric fuel impose apparently irrevocable intergenerational costs. However, constraints upon nuclear fuel cycle use and improvement may also have intergenerational impacts, through depletion of nonrenewable fossil fuel and uranium resources. Rules-of-trade and institutions should be designed to safeguard nuclear-electric fuel cycles through the transition to nonnuclear or advanced nuclear cycles, to internalize intergenerational costs, to minimize costs including social costs, and to avert institutional incentives or legal commitments that would perpetuate fuel cycles after preferred cycles were available. Social costs of nuclear power have not been adequately reflected in the marketplace: parties in interest have been unrepresented, or without legal rights, or without information, or without the institutional framework to achieve mutually preferable outcomes to those driven by export sales competition. International rules of nuclear trade require a set of institutions to render them effective.

0736 New Areas for Reducing the Risk of Outbreak of Nuclear War.

Analytic Services Inc., Falls Church, Va. February 1977. 93pp.

One of the fundamental steps in the process of arms control planning and bilateral U.S.-U.S.S.R. negotiations to prevent crises that could lead to nuclear war is the identification of such crises. This report investigates and assesses broad categories of events that could precipitate these crises. The problem is to search for as yet unidentified new categories of events; i.e., categories outside the coverage of the 1971 agreement, the 1973 agreement, and areas already studied (or now being studied) by the arms control community or other research and analysis groups.

0830 Changing Dimensions of Proliferation Policy.

Hudson Institute Inc., Croton-on-Hudson, NY. Lewis A. Dunn. February 1977. 136pp.

Since India's detonation of a nuclear-explosive device, increasing attention has focused upon policies for retarding the future spread of nuclear weapons. Part 1 of this report, after briefly sketching the reasons for believing that additional proliferation could occur and reviewing the probable dangers of a more proliferated world, examines such policies. Means of reinforcing technical constraints upon prospective proliferators and measures for influencing their disincentives and incentives for going nuclear are identified and evaluated. Possible responses to future dramatic proliferation events or turning points, events that could influence significantly the scope, pace, and characteristics of possible future proliferation, also are discussed.

Reel X

0001 The Effects of Nuclear Weapons.

Department of Defense, Washington, DC. Samuel Glasstone, and Philip J. Dolan. 1977. 660pp.

When "The Effects of Atomic Weapons" was published in 1950, the explosive energy yields of the fission bombs available at that time were equivalent to some thousands of tons (i.e., kilotons) of TNT. With the development of thermonuclear (fusion) weapons, having energy yields in the range of millions of tons (i.e., megatons) of TNT, a new presentation, entitled "The Effects of Nuclear Weapons," was issued in 1957. A completely revised edition was published in 1962 and this was reprinted with a few changes early in 1964. Since the last version of "The Effects of Nuclear Weapons" was prepared, much new information has become available concerning nuclear

weapons effects. This has come in part from the series of atmospheric tests, including several at very high altitudes, conducted in the Pacific Ocean area in 1962. In addition, laboratory studies, theoretical calculations, and computer simulations have provided a better understanding of the various effects. Within the limits imposed by security requirements, the new information has been incorporated in the present edition. In particular, attention may be called to a new chapter on the electromagnetic pulse. The material is arranged in a manner that should permit the general reader to obtain a good understanding of the various topics without having to cope with the more technical details. Most chapters are thus in two parts: the first part is written at a fairly low technical level, whereas the second treats some of the more technical and mathematical aspects. The presentation allows the reader to omit any or all of the latter sections without loss of continuity.

0661 The Nuclear Threat as an Instrument of National Policy.

Army War College, Carlisle Barracks, Pa. Ronald A. Roberge. March 1977. 26pp.
This paper analyzes the impact of nuclear armaments on U.S. national and military policy since World War II. The immediate post-World War II years are reviewed with the conclusion that the threat of the atomic bomb was of little value for specific application during this period of U.S. nuclear monopoly. The era of U.S. superiority during the 1950s is assessed, including the nuclear threat during the Korean conflict, the concept of massive retaliation, and the 1956 Suez crisis. Evidence supporting the efficacy of the nuclear threat remains inconclusive. In the 1960s, with the move to parity, the issues become more sophisticated. The Cuban Missile Crisis provided a theater for nuclear threats but Cuba's proximity to the U.S. gave conventional military power the major role. Because of the threat of escalation of a conflict to mutual annihilation, the U.S. and the Soviet Union tend to avoid direct political or military confrontation; thus the nuclear threat appears to have great utility in deterring conflict but less value in deterring initial aggression. In the present and future, it becomes necessary to balance desires for meaningful limitations on strategic nuclear weapons against the possibility that reduced levels may make general war more acceptable. The nuclear threat, as posed by both superpowers, has utility as an instrument of national policy but not when employed as an act of desperation.

0687 Analyzing Soviet Strategic Arms Decisions.

Institute for Defense Analyses, International and Social Studies Div., Arlington, Va. Karl F. Spielmann. April 1977. 157pp.

This paper addresses the basic question of why Soviet decision makers make the strategic arms decisions they do by examining the nature of those decisions, assessing the capabilities and limitations of such analyses, and suggesting ways to enhance their usefulness to policy makers. The importance of providing "answers" to policy makers in this highly complex and data-poor field generates a particular need for analysts to maximize the use of available data and to be aware of the analytical assumptions they bring to the task. Therefore, it is suggested that multiple-approach analyses would be more useful than the reliance on a single analytic view. Three approaches that might be pursued in juxtaposition in examining individual Soviet strategic arms decisions are presented. These are the rational strategic actor approach, the pluralistic approach, and the national leadership approach. The first two decision-making approaches basically reflect two broad schools of thought on the Soviet-U.S. strategic arms relationship that stress, alternatively, responsiveness to the international threat and internal bureaucratic and organizational processes as shapers of strategic arms programs. The third approach represents a middle ground between them that has not been emphasized heretofore. These three approaches are put forth without extensive elaboration or refinement to give an initial indication of the possibility and the utility of juxtaposing discrete sets of analytic assumptions in addressing the whys and wherefores of a particular Soviet strategic arms decision.

0844 Nuclear Proliferation and Safeguards (Main Report).

Office of Technology Assessment, Washington, DC. June 1977. 262pp.

This report provides an analysis of the various initiatives proposed to reduce or eliminate nuclear weapons proliferation. The technical, institutional, and political

options discussed in the report are set in the context of the various nuclear reactor fuel cycles to which they relate. The policy options presented to combat the spread of nuclear weapons correspond to differing levels of perceived risk of proliferation relative to the need for nuclear energy. This study was prepared at the request of the Committee on Government Affairs of the U.S. Senate.

Reel XI

- 0002 **Nuclear Proliferation and Safeguards. Volume 2. Appendix. Part 1.**
Office of Technology Assessment, Washington, DC. June 1977. 598pp.
This report provides an analysis of the various initiatives proposed to reduce or eliminate nuclear weapons proliferation. The technical, institutional, and political options discussed in the report are set in the context of the various nuclear reactor fuel cycles to which they relate. The policy options presented to combat the spread of nuclear weapons correspond to differing levels of perceived risk of proliferation relative to the need for nuclear energy. This study was prepared at the request of the Committee on Government Affairs of the U.S. Senate. Topics discussed in this volume include the following: incentives/disincentives; peaceful nuclear explosions; nonstate adversaries; international nuclear industry; technical descriptions of fuel cycle facilities and evaluation of diversion potential.
- 0600 **Nuclear Proliferation and Safeguards. Volume 2. Appendix 2. Part 2.**
Office of Technology Assessment, Washington, DC. June 1977. 553pp.
This report provides an analysis of the various initiatives proposed to reduce or eliminate nuclear weapons proliferation. The technical, institutional, and political options discussed in the report are set in the context of the various nuclear reactor fuel cycles to which they relate. The policy options presented to combat the spread of nuclear weapons correspond to differing levels of perceived risk of proliferation relative to the need for nuclear energy. This study was prepared at the request of the Committee on Government Affairs of the U.S. Senate. This volume considers the following topics: dedicated facilities; purchase and theft; description of safeguards technology and procedures; international controls.

Reel XII

- 0001 **U.S. Strategic Nuclear Weapons and Deterrence.**
Rand Corp., Santa Monica, Calif. C. Johnston Conover. August 1977. 62pp.
This paper is devoted exclusively to the question of how strategic nuclear forces in particular contribute to U.S. deterrence against the Soviet Union.
- 0064 **The Faces of Verification: Strategic Arms Control for the 1980s.**
Rand Corp., Santa Monica, Calif. Robert Perry. August 1977. 32pp.
Soviet military doctrine incorporates a concept of, and the U.S.S.R. has sought, strategic superiority—the possession of vastly superior forces coupled with an ability to strike first, thus limiting damage to the U.S.S.R. Soviet leaders appear to be structuring their forces not merely to survive and retaliate for any attack, but to exploit—by coercion, for deterrence, or if necessary by war—any opportunity that the acquisition of strategic superiority might present. Verification of Soviet compliance with the agreed terms of a strategic arms limitation agreement is, therefore, an obvious and necessary but not sufficient condition for U.S. confidence that major asymmetries in the strategic balance will not occur. The goal of the U.S. is to obtain credible assurance that the U.S.S.R. cannot clandestinely acquire destabilizing strategic capabilities. While there remains any substantial doubt of U.S. capabilities to detect Soviet deceptions, the U.S. will balk at accepting unverifiable Soviet assurances.

- 0095 **An Evaluation of the Administration's Proposed Nuclear Non-Proliferation Strategy.**
General Accounting Office, International Div., Washington, DC. Report to Congress. October 1977. 82pp.
Dwindling supplies of fossil fuels are causing countries to turn increasingly to nuclear power as a major source of energy. Although nuclear power holds out the promise of energy independence, it has a formidable drawback—it can also lead to the proliferation of nuclear weapons. In April of 1977, the President announced a new policy designed to curb nuclear proliferation and the executive branch proposed legislation entitled "The Nuclear Non-Proliferation Policy Act of 1977." The strategy outlined in these documents calls for stricter export controls and safeguards as well as actions affecting uranium enrichment services, reprocessing, storing of spent fuel, and disposing of radioactive nuclear wastes. GAO analyzed this non-proliferation strategy as it relates to: Improving nuclear export controls; strengthening international nuclear safeguards; maintaining U.S. reliability as a supplier of uranium enrichment services; deferring U.S. reprocessing of spent fuel as an example for others; reducing risk of proliferation by controlling spent reactor fuel. In general GAO concluded that the administration's strategy is constructive but noted some weaknesses which should be addressed. Some of the problems noted in this report may already have been addressed by congressional committees in their markup of the legislation.
- 0177 **Overview of Nuclear Export Policies of Major Foreign Supplier Nations.**
General Accounting Office, International Div., Washington, DC. October 1977. 66pp.
The U.S. faces increased competition from foreign nuclear suppliers, including West Germany, France, the U.K., Canada, and possibly, in the near future, Japan. This general overview shows the differences and similarities in foreign nuclear supplier export requirements. It is based on summaries furnished by the Department of State covering the nuclear export policies and procedures of the major foreign supplier nations.
- 0242 **Statements That Analyze Effects of Proposed Programs on Arms Control Need Improvement.**
General Accounting Office, International Div., Washington, DC. Report to Congress. October 1977. 51pp.
Section 36 of the Arms Control and Disarmament Act, as amended (22 U.S.C. 2576), requires that arms control impact statements be submitted to the Congress in conjunction with requests for authorization and appropriations for nuclear weapons systems and other programs having significant impact on arms control policy and negotiations. This report describes problems the executive branch has experienced in implementing this legislative requirement.
- 0292 **War Fighting Options and the Strategic Nuclear Balance: The American Debate.**
Army War College, Carlisle Barracks, Pa. John F. Scott. November 1977. 29pp.
The major assumptions behind strategic war fighting capabilities are that war with strategic weapons can be controlled, that such a war can be stopped short of extensive damage to the society of either belligerent, and that a war fighting capable deterrent is the best deterrent to another's war fighting capable force. When either side's counterforce weapons stockpile exceeds that for war fighting, and constitutes the bulk of a deterrer's strategic force, it should more properly be called a war winning posture. The latter capability has another assumption of its own: that a strategic nuclear war can be won.
- 0318 **Candidate U.S. Civil Defense Programs.**
System Planning Corp., Arlington, Va. Roger J. Sullivan, Winder M. Heller, and E.C. Aldridge, Jr. March 1978. 91pp.
This report documents the results of an analysis of candidate U.S. civil defense programs, assuming a mid-1980s Soviet attack versus counterforce and counter-value targets. Six specific programs and two options to these programs were identified. Estimates were made of numbers of survivors and program costs.

- 0423 **Civil Defense in the U.S.**
Naval Postgraduate School, Monterey, Calif. Theodore Eleftherios Tzavellas. March 1978. 51pp.
 This thesis analyzes civil defense within the context of its contribution to U.S. national, political and military strategy, reviews its acceptance by and utility to the American populace, and promotes some recommendations and conclusions which may be useful to future discussions of the topic. Included in the thesis and interspersed throughout are references to the present level of Soviet civil defense preparedness and capabilities based on the most current and complete unclassified data available.
- 0475 **SALT II Ratification Issues.**
National Defense University, Washington, DC. Joel M. McKean. March 1978. 30pp.
 The fact that a SALT II treaty, like the interim agreement of SALT I, is open-ended in the sense that follow-on negotiations commence at the point where the current talks conclude, makes its ultimate success or failure dependent upon future negotiations. Those against as well as those for ratification of a treaty will predict these future events in such a way as to make their own case. However, if one examines a SALT II treaty in the context of the best estimates of ongoing Soviet strategic programs and U.S. strategic programs, as reflected in the current budget under consideration, it is clear that neither strategic equivalence nor nuclear deterrence can be preserved without a significant increase in U.S. strategic offensive programs, unless follow-on negotiations redress the persisting asymmetries of SALT I and II. The very nature of negotiations precludes the explicit prescription of final treaty elements ahead of time.
- 0505 **Measures and Trends—U.S. and U.S.S.R. Strategic Force Effectiveness.**
Santa Fe Corp., Alexandria, Va. Herbert Hoppe, Norman Polmar, and A.C. Trapold. March 1978. 116pp.
 The purpose of this report is to compile and describe the measures of effectiveness which have been used in the comparisons and analyses of U.S. and Soviet strategic nuclear forces and weapons systems. Historical trend plots of twelve general measures of effectiveness and, where applicable, relevant subsets of these measures are presented. For each of the measures, a description is also provided which identifies the limitations and uncertainties associated with the particular measure.
- 0620 **War Termination Concepts and Political, Economic and Military Targeting.**
SRI International, Strategic Studies Center, Arlington, Va. James E. Dornan, Jr., M. Mark Earle, Jr., Stephen P. Gilbert, Charles H. Movit, and Arthur A. Zuehlke, Jr. March 1978. 96pp.
 This report presents a conceptual framework for assessing the utility of limited strategic nuclear options for war termination. It proceeds from a basic assumption that the Soviet Union has initiated overt military hostilities against the U.S. or its allies which have sufficient momentum for extended conflict or rapid escalation to unrestricted nuclear war. The efficacy and implications of the U.S. employing a limited strategic nuclear response to terminate hostilities are examined. War termination concepts as they relate to U.S. official strategic thinking are considered. Concepts of thresholds, communicating intent, strategic consequences, capabilities, linkages, escalation, termination and target categories are examined in an LSO context. Soviet views on limited strategic war are appraised. Two scenarios depicting hypothetical circumstances which might lead to using an LSO for war termination purposes are described. An analysis of economic targeting for war termination is presented. Force posture implications are derived.
- 0716 **Verification of SALT Agreements.**
Virginia University, Woodrow Wilson Dept., of Government and Foreign Affairs, Charlottesville, Va. Roderick P. Nasbe. May 1978. 205pp.
 Partial contents: Verification—means and techniques, and evolution of verification technology; Pre-SALT (1945-1971)—early negotiations, agreements of minor significance for verification and The Limited Test Ban Treaty; SALT I (1969-1972)—negotiations, terms of the agreements, verification provisions, alleged violations,

and the Standing Consultative Commission; SALT II (1972-1977)—The Vladivostok Accord, MIRV and verification, issues (Cruise missiles, Backfire bombers, mobile missiles, and SS-20 missiles), 1977 negotiations—Carter's proposals, the deferral proposal, the comprehensive proposal, and follow-on discussions; and beyond SALT II.

- 0920 **Civil Defense and American Federalism: A Preprimer.**
Eastern Washington University, Dept. of Government, Cheney, Wash. Shane E. Mahoney, June 1978. 29pp.

Although responsibility for American civil defense preparedness is lodged with the Department of Defense, the separate states are not absolved from a large role in the implementation of current civil defense plans. As a result, civil defense against a nuclear attack involves the realities of American federalism in a way that other defense-related programs, such as the creation of a strategic weapons force, ordinarily do not. The purpose of this study is to analyze the impact of federalism on the American civil defense effort with a view toward an improved understanding of the political and organization constraints that policymakers face in the realm. Its main thesis is that the politics of American federalism have allowed the current civil defense program to be captured by state and local natural disaster interests. Correction of this problem requires that the separate issues now included within the rubric and organizational framework of civil defense be sorted out and addressed individually. Once this is done, it can be seen that there is little reason to include each of them within the same agency.

Reel XIII

- 0001 **The Applicability of Satellite Technology to Defense Civil Preparedness.**
Comsat General Corp., Washington, DC. June 1978. 96pp.
This study assesses the applicability of satellite technology to the DCPA mission. Surveys of currently available and planned communication and remote sensing satellite systems are presented. A section on postnuclear blast propagation conditions is included. Conceptual satellite network plans, one based on a dedicated network and one on commercial transponder leasing, are developed, leading to a plan for a preliminary demonstration network. The study concludes that a satellite-based civil preparedness communication network could support both peacetime and disaster-oriented requirements practically, that the use of remote sensing for resource data base inventorying is presently inadvisable, that the 6/4 GHz band offers the best technical and most cost-effective means for initial implementation, and that use of remotely located sensor monitor terminals to collect and transmit radioactive fallout data to a central processing facility is feasible.
- 0089 **The Carter Administration and SALT.**
Army Military Personnel Center, Alexandria, Va. Robert W. Hess. July 1978. 58pp.
This paper is a study of the Carter administration's position on the SALT negotiations. The purpose of the paper is to describe and analyze the domestic pressures constraining the Carter administration's SALT negotiating options. Particular emphasis is placed on the roles played by various veto and consultative groups, and by the momentum of arms programs as determinants of U.S. SALT policy formulation. The administration's SALT policy is also evaluated from the perspective of constraints inherited from previous administrations, particularly from the Nixon-Kissinger-Ford period. The thesis of the paper is that the Carter administration's SALT options have been significantly circumscribed by the actions of previous administrations, as well as by domestic and other factors. Moreover, an apparent lack of coordination and/or agreement within the administration has further complicated the task of developing a consensus toward the negotiations, making the early signing of a SALT II accord a matter of conjecture.

- 0147 **Nuclear Hostage: A New Factor in the Strategic Equation.**
Institute for Energy Analysis, Oak Ridge, Tenn. C.L. Cooper. July 1978. 22pp.
 No abstract available.
- 0167 **MBFR: Problems and Prospects.**
Army Military Personnel Center, Alexandria, Va. Robert W. Hess. August 1978. 98pp.
 The purpose of this paper is to assess the state of the Mutual Force Reduction (MFR) talks in Vienna, and to examine the possibilities for progress in the near future. The analysis begins with an examination of the initial postwar military and political milieu and its impact on the current negotiations. Included in the subsequent analysis are discussions on the conventional balance in the guidelines areas, the impact of recent technological innovations on the conventional balance; the role of both strategic and tactical nuclear weapons in the talks, and the major proposals offered by the two alliances. Additionally, the proposals are viewed from the perspectives of the various participants (both inter- and intra-alliance politics), with a view toward predicting possible concessions on the major stumbling blocks to an agreement, such as collectivity and parity, the data issue and the geographical problem. Finally, the paper evaluates the prospects for progress under the current negotiating environment, and concludes with a suggestion for a possible new approach for NATO at Vienna.
- 0265 **Technology and Arms Control.**
National Defense University, Research Directorate, Washington, D.C. Donald J. Stukel. September 1978. 47pp.
 Arms control is a vital and highly controversial national security issue. Among other factors, technological considerations seriously complicate the development and negotiation of arms control proposals. The monograph examines the interaction between arms control and technology, with emphasis on the research and development function. The author argues that it usually is not feasible to reach arms control agreements which place controls on research and development activities, and that it is imprudent to place unilateral controls on these activities. In suggesting the need for closer integration of arms control and security policies, he calls for an increased exchange of information between the defense research and development community and arms control specialists. This monograph makes a significant contribution to the dialogue on arms control in general and in particular to questions of its relationship to technology, especially research and development.
- 0310 **Impacts of Crisis Relocation on U.S. Economic and Industrial Activity.**
Center for Planning and Research Inc., Palo Alto, Calif. Richard Laurino, Frank Trinkl, Robert Berry, Ruth Shnider, and William MacDougall. October 1978. 212pp.
 This study is the second phase of a DCPA project on determining the potential economic and industrial impacts of crisis relocation. As a result of the first-phase study, a number of problems were further examined: the advantages and disadvantages of the payment mechanisms to be used during the relocation period, estimates of levels of activity in essential industry categories, overall economic impact during and after crisis, and applications of study findings to a local test area (Colorado Springs, Colorado).
- 0520 **The Role of the Nuclear Power Issue in the Analysis of Contemporary International Relations.**
Naval Postgraduate School, Monterey, Calif. Ted Allen Lloyd, Jr. December 1978. 159pp.
 Political analysis must keep pace with rapidly changing, ever more complex international relations. This thesis suggests that a systematic study of the nuclear energy issue is one logical choice for comprehensive international political analysis. Nuclear power policies and debates are examined for their ability to reflect current international trends of conflict and cooperation. Nuclear-related events trigger responses over a wide range of issues, permitting an analyst to observe the various courses of national foreign policy in action. As one observes how nations interact in response to nuclear events, patterns are revealed, thus increasing one's knowledge

of contemporary international relations. A paradigm is offered to systematize the analysis of nuclear-related events. A nuclear perspective is illustrated by examining worldwide trends on a global scale, European trends on a continental scale, and French foreign and domestic policies on a national scale. The nuclear power perspective serves as a valuable analytical tool with which to chart and interpret trends and events.

0679 **Issues of Civil Defense: Vintage 1978—Summary Results of the 1978 National Survey.**

University of Pittsburgh, Center for Social and Urban Research, Pittsburgh, Pa. Jiri Nehnevajsa, George Rogers, and Steven Manners. February 1979. 417pp.

This report deals with the aggregate results of a late 1978 survey of a probability sample of 1,620 Americans (18 years and older in the 48 contiguous states) on issues central to the problem of civil defense. Many questions from previous national studies (1972, 1968, 1966, 1964, 1963) were repeated in the inquiry. The 1978 data show essentially the same results as did the previous inquiries: strong support for measures of civil defense that would stand a chance to enhance the survivability of our people in face of a nuclear attack (as well as selected other nuclear hazards). There exists strong support for appropriate in-place shelter systems (both public fallout shelters and home basement sharing). The nation reflects a high level of support for programs to develop protection against primary effects of nuclear weapons as well (blast sheltering). The 1978 survey included a major focus on issues having to do with crisis relocation. Since this has been a relatively new emphasis in DCPA, the questions raised in the inquiry are new. But some of the items were used on a study of the Fourth Congressional District of Missouri.

Reel XIV

0001 **Statement on Strategic Nuclear Forces by Dr. William J. Perry, Under Secretary of Defense for Research and Engineering, before the Armed Services Committee of the U.S. Senate 96th Congress, First Session.**

Office of the Under Secretary of Defense for Research and Engineering, Washington, DC. William J. Perry. February 1979. 20pp.

This report discusses strategic posture today with a few words about the character of the threat which these forces must respond to. Respond is a key word here since the forces which represent our real deterrent are those we would have left if the Soviets were to make a surprise attack. So, in planning our own strategic forces we walk a fine line, not configuring them to be so threatening to the Soviet Union that we fuel an arms race, or provide an incentive to the Soviets to preempt, but at the same time making sure that enough forces can survive a Soviet attack to provide an effective deterrent. Almost month by month, this task becomes more difficult. The threat to each leg of the Triad will set the stage for our more extended discussion. The effectiveness of our B-52 forces as presently configured will continue to decline with the continuing build-up in both the size and strength of Soviet air defenses unless we take appropriate countermeasures. Our principal counter to improved Soviet air defenses, the air-launched cruise missile, is progressing well and our test programs indicate that the ALCM will be highly effective against current Soviet defensive systems and those that we expect to be deployed in the 1980s.

0021 **The Department of Defense Statement on Strategic Nuclear Posture.**

Office of the Under Secretary of Defense for Research and Engineering, Washington, DC. Ruth M. Davis. March 1979. 20pp.

For all of our strategic forces, and particularly for the command, control and communications (C3) networks which control and support them, we are increasingly concerned with endurance after the beginning of a nuclear war. Recent studies have pointed out that Soviet strategic doctrine does not envision a nuclear war as ending in a matter of hours, but rather, as continuing until one side or the other has gained military ascendancy. Whatever doubts one may have about the realism of such

expectations, the response to an attack of this type—and its deterrence—requires long term survivability and operability of both C3 systems and nuclear strike systems.

- 0041 **Civil Defense Needs of High Risk Areas of the U.S. Revision A.**
System Planning Corp., Arlington, Va. Roger J. Sullivan, Charles W. Hulburt, Mickey O. Marshall, Gordon H. McCormick, and Earl V. Sager. March 1979. 218pp.
This report documents the results of a study of special civil defense measures that might be used in areas of the U.S. that contain significant elements of the U.S. strategic nuclear retaliatory forces or significant defense-related research laboratories or facilities. The study includes: (1) an identification of these areas of the U.S., (2) a determination of existing and planned civil defense evacuation and shelter plans and warning systems for these areas, (3) an evaluation of the effectiveness of the existing plans and systems, (4) a determination of the feasibility of establishing more effective evacuation and shelter plans and warning systems for these areas, and of potential costs, (5) an analysis of the effects of a nuclear attack, and (6) a determination of the need for public information, training, and education on CD matters in these areas.
- 0256 **The People's Republic of China and Nuclear Weapons: Effects of China's Evolving Arsenal.**
Army Military Personnel Center, Alexandria, Va. Thomas Dell Washburn. March 1979. 110pp.
This study attempts to present the PRC's nuclear weapons development and strategy as a rational and carefully conceived plan. Some basic foundations and objectives of Peking's nuclear policy as well as highlights of China's developmental methods and the current (1978) status of the PRC's nuclear weapons and nuclear weapons delivery vehicles are discussed. Aspects of the PRC's past and present strategic thinking on the employment and control of nuclear weapons are also mentioned. Finally some conclusions and predictions for the future are offered.
- 0366 **The Effects of Nuclear War.**
Arms Control and Disarmament Agency, Washington, DC. April 1979. 28pp.
This report presents a summary of the effects of nuclear war. The first part of the report deals with the effects of a single nuclear weapon, the second part discusses the effects of general nuclear war between the U.S. and the Soviet Union, and finally the paper addresses some of the less known but nonetheless important effects of such a war.
- 0394 **International Political Effects of the Spread of Nuclear Weapons.**
Central Intelligence Agency, Washington, DC. April 1979. 238pp.
The publication is a collection of 10 analytical and speculative essays on the international political effects of the spread of nuclear weapons written by 10 eminent American scholars. The first essay, written by a scientist, analyzes what is technically feasible in the development or acquisition of nuclear weapons and delivery systems by states now without them. The following eight essays, written on the assumption that 12 additional nations join the nuclear weapons club between the present and the mid-1990s discuss: Effects on North-South issues, the effects on regional conflicts in South Asia and in the Middle East, the likely reactions of the People's Republic of China and of the Soviet Union to the spread of nuclear weapons, the possibilities and implications of terrorist groups acquiring nuclear weapons, the impact on strategic concepts and planning, and the effects on basic concepts and practices in the conduct of international relations. A final essay weighs the adequacy of present analytical tools and methods to deal with the subject of future nuclear weapons proliferation and suggests some new approaches to research and analysis.
- 0630 **High Risk Areas of the U.S. Identified by Congressional District.**
System Planning Corp., Arlington, Va. Earl V. Sager, Charles W. Hulburt, and Roger J. Sullivan. May 1979. 42pp.
This report locates by congressional district within each state of the continental U.S.

those areas subject to blast damage in a counterforce attack as identified in TR-82. These areas are identified by cross-hatch as on state maps.

- 0670 **An Analysis of the Future Effectiveness of the Sea-Based Deterrent.**
Army Command and General Staff College, Fort Leavenworth, Kans. John J. Kelly, Jr. May 1979. 38pp.
Evaluates the deterrent capability of the Trident submarine and analyzes capabilities against antisubmarine warfare.
- 0708 **Winning the Unthinkable War.**
Army Command and General Staff College, Fort Leavenworth, Kans. Joseph B. Boyce, Jr. May 1979. 34pp.
The purpose of this research study is to assess the strategic importance of Soviet civil defense in nuclear war. Based on unclassified information, this analysis contrasts U.S. and Soviet views on nuclear war, examines Soviet war-survival preparations, and identifies some implications of these programs. Finally, recommendations for maintaining the strategic balance are presented.
- 0740 **The Warsaw Pact Short Warning Nuclear Attack: How Viable an Option.**
Army Russian Institute, APO, New York. Donald Mercer. May 1979. 57pp.
NATO bases its theater doctrine on the assumptions that any Warsaw Pact attack will be preceded by considerable warning time and that initial hostilities will be in a conventional mode. In this paper the author assesses the viability of the opposing scenario: A Warsaw Pact short warning attack with nuclear weapons employed from the start. The author concludes that Soviet open source documents indicate that NATO is preparing to fight the wrong first battle of the next war.
- 0796 **The Effects of Nuclear War.**
Office of Technology Assessment, Washington, DC. May 1979. 159pp.
The study examines the full range of effects that nuclear war would have on civilians: direct effects from blast and radiation, and indirect effects from economic, social and political disruption. Particular attention is devoted to the ways in which the impact of a nuclear war would extend over time. Two of the study's principal findings are that conditions would continue to get worse for some time after a nuclear war ended, and that the effects of nuclear war that cannot be calculated in advance are at least as important as those which analysts attempt to quantify. The report provides essential background for a range of issues relating to strategic weapons and foreign policy. It translates what is generally known about the effects of nuclear weapons into the best available estimates about the impact on society if such weapons were used. It calls attention to the very wide range of impacts that nuclear weapons would have on a complex industrial society, and to the extent of uncertainty regarding these impacts.
- 0950 **The Neutron Bomb—A Credible Deterrent.**
Army Command and General Staff College, Fort Leavenworth, Kans. Vincent L. Bristow. May 1979. 15pp.
Describes the neutron bomb, its effectiveness and why the weapon should be considered a credible deterrent force.

Reel XV

- 0001 **New Alternatives for Targeting the Soviet Union.**
Analytical Assessments Corp., Marina Del Rey, Calif. George H. Quester. July 1979. 58pp.
New options for targeting the U.S.S.R. are made necessary by the growing threat of Soviet strategic forces, and are made possible by the increased accuracies and numbers of American warheads. The increase in American capabilities not only would allow destruction of some targets which previously have been invulnerable,

but also allows the sparing of important facilities in the U.S.S.R. while surgically targeting others. What to hit, and what to spare, will thus be much more important questions than in the past. The most important U.S. objective remains to deter Soviet aggression in the first place. Other important considerations are to reduce damage to the U.S. and its allies if a war should nonetheless occur, to keep the Soviets from gaining politically in such a war, and to limit escalation and facilitate war termination.

- 0059 **Civil Defense and the Public: An Overview of Public Attitude Studies.**
Federal Emergency Management Agency, Washington, DC. Ralph L. Garrett. August 1979. 91pp.
This report outlines relevant aspects of civil defense history and provides a general overview of public attitudes during the past 25 years. Public attitude findings are summarized under such topics as the international context, threat perception, general favorability, program support salience, perceptions of local programs, perceptions of shelters as a survival resource, response to warning, and training and education impact. Findings are reviewed relevant to such special audiences as information seekers, youth, local governing bodies, volunteers and voluntary associations, and the community power structure. The credibility and acceptance of crisis relocation programs, home basement sharing, and blast shelter programs are discussed. The implications of the findings and their bearing on program development are reviewed.
- 0149 **American Nuclear Strategy: A Selective Analytic Survey of Threat Concepts for Deterrence and Compellance.**
Rand Corp., Santa Monica, Calif. Michael W. Kanzelberger. September 1979. 63pp.
This report surveys analytically selected nuclear strategies proffered in the unclassified literature since World War II. Types and subtypes of strategies are identified and analyzed on the basis of the threat concepts that underpin them and the targeting schemes that back them up. Entries are catalogued according to whether the implied threat promises to punish, deny, or compel adversary actions, roughly in order of the amount of destruction suggested by the accompanying target plan, from greatest to least intended trauma. Each entry is then followed by one or more abstracts of selected works seminal to, or representative of, that particular variant, highlighting assumptions about the relationship of the threat design of U.S. political objectives and tracing the implications carried in the event that the weapons must be used.
- 0212 **Strategic Warning and General War: A Look at the Conceptual Issues.**
Rand Corp., Santa Monica, Calif. Ralph Strauch. October 1979. 60pp.
Explores conceptual issues related to strategic warning of general nuclear war. A threat/response cycle is proposed as a conceptual model of warning situations and used to explore the differences between tactical and strategic warning. Response to strategic warning is discussed, as is the assessment of the utility of strategic warning.
- 0271 **Outlasting SALT II and Preparing for SALT III.**
Rand Corp., Santa Monica, Calif. William E. Hoehn, Jr. November 1979. 63pp.
This report attempts to answer three questions regarding the strategic arms limitations talks: First, given that SALT II in and of itself does not resolve our major strategic problems, does it provide a framework within which planned U.S. unilateral actions would resolve those problems? If not, what kinds of additional limitations should the next round of negotiations—SALT III—aim for? And, finally, what set of plans and what strategy offer some promise of leading to an effective SALT III outcome? Some prospect is offered in at least one construct of SALT III, through lower ceilings and more explicit limitations on missiles, of permitting U.S. unilateral actions to redress the strategic balance. The suggested approach is to pursue an option-generating research and development strategy consistent with the provisions of SALT II. The issue is whether the U.S. political system can do a better job by competing while cooperating with the Soviet Union, rather than by merely switching intermittently from one course to the other.

- 0332 **Survival during the First Year after a Nuclear Attack.**
System Planning Corp., Arlington, Va. Roger J. Sullivan, Kurt Guthe, William H. Thoms, and Frank L. Adelman. December 1979. 206pp.
A study was performed of survival during the first year after a large-scale nuclear attack against the U.S. Crisis relocation and expedient fallout protection were assumed to have occurred prior to the attack. Survival in the state of Ohio was analyzed in detail. Energy, transportation, food, water, housing, clothing, sanitation, health, communications, emergency services, residual radiation, and environmental effects were all considered.
- 0524 **Soviet Nuclear Energy: Domestic and International Policies.**
Rand Corp., Santa Monica, Calif. G. Duffy. December 1979. 158pp.
Research on Soviet nuclear export policies comprises one element of Rand's studies of comparative nuclear non-proliferation policies of major supplier nations. Soviet views on the dispersion of nuclear technology and attitudes toward the spread of nuclear weapons are rarely accorded more than a passing reference in discussions of nuclear energy and international security. But Soviet nuclear export policies are significant for a variety of reasons. The Soviet Union is the principal nuclear technology supplier to many COMECON countries, and a long-standing proponent of the Nuclear Non-Proliferation Treaty (NPT) of 1968. The Soviet Union is the largest supplier of nuclear enrichment services to Western Europe and a supplier of heavy water to India. Soviet commitments to nuclear fuel cycle deployments and attitudes toward the international regulation of technology transfer can affect the efficacy of international policies designed to separate the uses of nuclear technology for electricity production and for weapons production. Analysts of Soviet energy policies, nuclear non-proliferation policies, and comparative strategies for limiting dependence on oil imports will find information in this study that is not otherwise available in convenient form in any single public report. This report is limited to information that could be obtained from public sources. Four figures, 19 tables.
- 0677 **Arms Control and Disarmament Agreements: Texts and Histories of Negotiations.**
Arms Control and Disarmament Agency, Washington, DC. 1980. 248pp.
The report contains the texts of agreements between world powers on the limitations, prohibitions, and ban of weapons and warfare. The time frame runs from the end of World War I to 1980.

Reel XVI

- 0001 **Survival, Reconstitution and Recovery: U.S.-Soviet Asymmetries and U.S. Policy Options.**
SRI International, Strategic Studies Center, Arlington, Va. Richard B. Foster, and Francis P. Hoerber. February 1980. 159pp.
This report summarizes a year of study for DCPA/FEMA on the potential contribution of civil defense and emergency preparedness to survival, reconstitution and recovery in the event of nuclear war. Principal findings include: (1) The Soviets believe that a nuclear war can be survived and they therefore plan and prepare to attempt to assure survival and recovery. (2) The widespread belief in this country that any nuclear war will produce a shock that destroys national cohesion may be self-fulfilling if no steps are taken to prepare to survive. (3) Preparation must start with the education of the American people as to what can be done, and preparations to assure the ability of a surviving and caring government to communicate to the people during the first phases of a nuclear war about what is being done and what needs to be done. (4) All civil planning must be done in close coordination with the planning of military doctrine, forces and C3. (5) It also became clear in the study that survival and reconstitution are preconditions for recovery and must be studied and planned for before consideration of recovery is relevant.

- 0159 **A Credible Deterrence in the 1980s.**
Army Command and General Staff College, Fort Leavenworth, Kans. John M. Hart. April 1980. 59pp.
The U.S. is faced with Soviet improvements in strategic theater weapons systems and a massive civil defense program. Given the present U.S. deterrent policy, it is questionable whether the U.S. will be able to prosecute a war at a level less than full-scale nuclear war. This study discusses the viability of the strategic Triad and whether NATO will be able to deter the U.S.S.R. with conventional forces or have to rely upon theater nuclear forces. The final recommendation suggests that the U.S. must update its strategic weapons systems and improve the overall capabilities of our forces supporting NATO whether it be nuclear or conventional.
- 0218 **Tactical Nuclear Operations: The Doctrinal Dilemma.**
Army Command and General Staff College, Fort Leavenworth, Kans. Steven F. Tomhave. May 1980. 78pp.
The situation surrounding tactical nuclear weapons use is one affected by a great number of vital factors. The most basic is the doctrinal foundation upon which all tactical nuclear operations are built. U.S. nuclear deterrent credibility rests on how effective that doctrine is in convincing the enemy of the will to employ it as viable strategy on the battlefield. This study discusses the basics of tactical nuclear operations—the balance in weapons systems, the author's deterrence analysis, and his conclusions and recommendations. The final recommendation suggests a new theater nuclear doctrinal statement be established which is explicit, direct and above all, one which reflects the national will.
- 0296 **Reflexive Launch Strategies.**
Naval Postgraduate School, Monterey, Calif. Kurt Allan Strauss, June 1980. 119pp.
Given the impending vulnerability of U.S. ICBMs, this thesis assesses the viability of countervailing reflexive launch strategies. Arguments are based on logical analysis of capabilities within the context of political realities. This thesis establishes the relative utility of reflexive launch strategies as part of the total strategic deterrent posture. Presentation of evidence (logical, historical, quantitative) supports a case for specific reflexive launch options. The central thesis is that regardless of technical capabilities, e.g., warning systems or C3 (command, control and communications), reflexive strategies are not substantial enough to act as a doctrinal shield for inherently vulnerable land-based forces. Alternatively, it will be shown that within the context of existing/projected U.S. weapons systems (e.g., MX, ALCM), as well as Soviet forces and perceptions, the capability for rapid retaliation prior to impact or immediately following an attack will remain an essential element of a credible deterrent. It is argued that survivable weapons simply shift vulnerability to the centers of political and economic power and do not obviate the requirement for deterring reflexive launch options.
- 0416 **Launch under Attack: A Strategy to Enhance Deterrence.**
Army Command and General Staff College, Fort Leavenworth, Kans. Harry W. Thomas. June 1980. 119pp.
This study attempts to determine if there is a need for the U.S. to adopt an alternate strategy for the use of strategic nuclear weapons. The investigation is focused on analysis of historical development of nuclear strategies and weapon procurements and an appraisal of the current capabilities of the U.S. and U.S.S.R. Investigation reveals that there is a distinct need for the U.S. to move away from the tenets of assured destruction to an alternate strategy of launch under attack in order to preserve the deterrent mission of its forces.
- 0535 **Evaluation of U.S. Efforts to Promote Nuclear Non-Proliferation Treaty.**
General Accounting Office, International Div., Washington, DC. Report to Congress. July 1980. 88pp.
The Nuclear Non-Proliferation Treaty is the world's principal political instrument for controlling the spread of nuclear weapons. However, more than 50 countries, some with nuclear programs, are not party to the treaty. The U.S. is using diplomatic

initiatives and incentives such as technical assistance to encourage more nations to become treaty parties. Principal objections of key nations include claims that the treaty discriminates against nonnuclear weapon states and could adversely affect their peaceful nuclear programs and endanger their national security and that nuclear weapons states have not aggressively pursued disarmament. In August 1980 the second conference of party states was held to review the operation of the treaty. This report discusses some of the issues raised.

0621 **Soviet Nuclear Proliferation Policy.**

Army War College, Carlisle Barracks, Pa. Joseph L. Nogee. August 1980. 32pp.

This memorandum considers the rationale behind the Soviet Union's behavior with regard to nuclear proliferation, relating its changing nuclear policies to the large context of strategic perceptions, interests and foreign policy priorities. The author contends that Soviet accession to the Non-Proliferation Treaty marked an important commitment to that goal; however, other objectives continue to have a higher priority. He examines three basic strategies toward achieving a non-proliferation regime (legal, political, and technical) and describes the extent to which the Soviet Union relies upon each. One of the author's conclusions is that like many Western powers (not including the U.S.), the Soviet Union is prepared to sacrifice non-proliferation to meet its anticipated energy needs.

0651 **A Conceptual Framework for a National Strategy on Nuclear Arms.**

Rand Corp., Santa Monica, Calif. Carl H. Builder. September 1980. 36pp.

This essay proposes a national strategy for nuclear arms. It argues for new ways of thinking about why we possess nuclear arms and how we should plan for their control and use. The arguments are developed within a conceptual framework composed of three national security dimensions: (1) the goals supported by the possession or use of nuclear weapons, (2) the immediate objective of our postures, and (3) the perceived proximity of conflicts. The formulation of logical strategy domains within this framework reveals some opportunities that have been historically neglected in U.S. nuclear arms policies. In particular, the essay suggests that our arms control efforts should be reoriented toward limiting theater forces and encouraging strategic defenses.

0684 **Implications for Arms Control in Technology Transfer to Less Developed Countries (LDCs) Volume I. Considerations in Controlling Dual-Use Technology Products: An Overview.**

Science Applications, Inc., Center for Security and Policy Studies, McLean, Va. David E. Murphy and James O. Frankovsky. September 1980. 74pp.

This volume provides some insights into possible motivations and potential paths for less developed countries to exploit dual-use technologies in achieving indigenous capabilities in potentially destabilizing systems such as surface-to-surface missiles, attack aircraft, tanks, and fast attack (naval) craft/missiles.

0759 **The Strategic Balance in Transition: Interpreting Changes in U.S.-U.S.S.R. Weapons Levels.**

Army War College, Carlisle Barracks, Pa. Robert Kennedy. October 1980. 34pp.

This memorandum evaluates the contentions of a number of defense analysts concerning the strategic build-up of the Soviet Union. The author evaluates the arguments that the Soviet Union is seeking strategic superiority, the U.S.S.R. will soon have the capability to execute a disarming first strike, and the appropriate U.S. response to growing Soviet capability should focus on the continued improvement of counterforce capabilities and the development and deployment of mobile or multiple aim point land-based missiles. He concludes that the U.S. must be concerned over growing Soviet capabilities; however, time remains to assess carefully all aspects of suggested alternatives and to further negotiate with the Soviet Union.

0792 **Ballistic Missile Defense: A Potential Arms-Control Initiative. Los Alamos Scientific Laboratory, N. Mex.**

Department of Energy, Washington, DC. G.E. Parasch, D.M. Kerr, R.H. Kupperman, R. Pollock, and H.A. Smith. January 1981. 25pp.

U.S. strategic forces must be restructured to meet national security objectives in a changing world. Growth and modernization of Soviet strategic missile forces are causing our land-based strategic missiles to become increasingly vulnerable to Soviet nuclear attack. For some strategic force configurations, the goals of flexible nuclear deterrence and strategic arms limitations appear mutually inconsistent. With such forces, prospects for arms limitations would degrade further if the current Soviet build-up were to continue, or if the Soviets were to install unilaterally an antiballistic missile system capable of wide area, multi-city defense, or both. However, if the U.S. installs an antiballistic missile system along with reduced but modernized offensive strategic forces, arms limitation appears compatible with both assured destruction and war-fighting deterrence policies. This conclusion appears equally valid for expanded Soviet forces even if the Soviets also install ballistic missile defenses. In particular, an American strategic posture including layered defense of MX missiles based deceptively in silos was analyzed. The exoatmospheric-intercept component of this defense system could also defend some of our cities and industrial and military installations. If the U.S. were to adopt this strategic posture, the authors believe it would create incentives for the Soviet Union to restrain strategic arms expansion. Mutual arms control initiatives could follow. Test and installation of the needed defensive systems are now precluded by the Antiballistic Missile Treaty adopted in 1972. An opportunity for treaty reconsideration occurs in 1982. Substantiation of the authors' results would suggest that consideration be given to treaty modifications or to replacing the treaty with other agreements.

0817 **The MX Weapons System: Issues and Challenges.**

General Accounting Office, Mission Analysis and Acquisition Div., Washington, DC. February 1981. 51pp.

Contents: MX cost and schedule issues; implications of arms limitation agreements on MX design; status of the development of the MX missile and ground support systems, and progress and problems in obtaining land and resources for construction and operations.

0868 **Nationwide Defense against Nuclear Weapons: Properties of Prim-Read Deployments.**

Institute for Defense Analyses, Program Analysis Div., Arlington, Va. Alan F. Karr. April 1981. 209pp.

The problem of allocation of defensive resources in nationwide defense against strategic nuclear attack is examined. Distinctive assumptions are that defenses are local, that attacking weapons directed at each target arrive sequentially (requiring that interceptors be allocated without knowledge of how many additional attacking weapons will follow), and that neither side can reallocate its resources during an attack. Prim-Read deployments are defined and analyzed in detail. Effects of the "target defense principle" that states that initially defended targets must remain more attractive than undefended targets (up to the point where destruction is certain) are investigated. Optimality and nonoptimality properties of Prim-Read deployments are established for the criteria of target value destroyed and target value destroyed per attacking weapon committed. Variations on the basic model, numerical examples, comparison of Prim-Read and proportional deployments, and discussion of physical implications of the mathematical results are included.

Reel XVII

0001 **Our Missing Shield: The U.S. Civil Defense Program in Historical Perspective.**

Yoshpe (Harry B.), Silver Spring, Md. April 1981. 591pp.

This volume, which traces the development of American CD from 1916-1980, focuses on policies, plans, programs, budgets, organization and management, and on the central problems and critical issues in planning for survival in a nuclear attack. The study concludes that after three decades of effort, the U.S. has only a

marginal CD program. Impediments to progress have been: The failure to grasp early, and to act on, implications of the experience of Britain, Germany and Japan under heavy bombing in WW II; delays in discarding outmoded concepts; difficulties in adjusting to the fast pace of weapons technology; excessive secrecy about the threat of nuclear weapons and radioactive fallout; limited federal power in CD; confusion regarding civil-military relations in this field; ambiguity as to the strategic impact of CD; problems in designing a balanced program and strategy for survival; instability in federal CD organization; and, of highest significance, Presidential and congressional indifference and neglect and attendant budgetary constraints. There is an urgent need for a national commitment to a meaningful civil defense program, with strong leadership from the President, to bring forth vigorous support from the Congress, state legislatures and city councils, and from the public at large.

0591 **NORAD's Missile Warning System: What Went Wrong.**

General Accounting Office, Mission Analysis and Acquisition Div., Washington, DC. Report to Congress. May 1981. 32pp.

The importance and criticality of the North American Air Defense Command's (NORAD's) computer system have recently been emphasized when false missile warning messages were generated and the nation's nuclear retaliatory forces alerted. The air force began a computer upgrade program for NORAD computers in 1968 which was expected to reach initial operational capability in November 1981. Due to poor management causing program delays and the attempt to adapt inadequate computers to the NORAD mission, the system falls short of meeting the requirements of the growing missile warning mission. NORAD will replace these computers by the late 1980s, but it needs to do more to improve management and warning capability.

0621 **The Nuclear Non-Proliferation Act of 1978 Should be Selectively Modified.**

General Accounting Office, Office of the Comptroller General, Washington, DC. Report to Congress. May 1981. 247pp.

The short-term impact of the Nuclear Non-Proliferation Act of 1978 in establishing an effective international framework for controlling the proliferation of nuclear explosive capabilities has been limited. However, it represents a long-term agenda requiring ambitious international initiatives which often take a long time to conclude. Although GAC does not believe that major changes should be made, it believes the act should be selectively modified to conform with political, technical, and economic realities; obtain wider international acceptance; preserve the framework for curbing the inherent risks of weapons proliferation associated with peaceful nuclear cooperation; and improve executive branch implementation. This report fulfills GAO's reporting mandate contained in the 1978 act.

0868 **Countervailing Strategy Demands Revision of Strategic Force Acquisition Plans.**

General Accounting Office, Mission Analysis and Acquisition Div., Washington, DC. Report to Congress. August 1981. 70pp.

To meet the requirements of deterrence in the 1980s, U.S. strategic nuclear forces will need capabilities not envisioned in the design of existing weapon and support systems. These requirements result from the threat posed by large numbers of effective Soviet nuclear forces and air defenses and from the deterrent strategy the U.S. adopted to neutralize the implications of that threat. This countervailing strategy includes the capability to survive a major Soviet nuclear attack, the capability to ensure destruction of the Soviet Union, and maintenance of a clearly evident capability to effectively engage in nuclear conflicts of a more limited nature. If projected increases in DOD spending are to effectively meet strategic needs, changes are needed to ensure that programs conceived under previous approaches to strategic deterrence can meet new requirements. The secretary of defense should develop an acquisition strategy that clearly delineates the programs needed to meet the requirements of countervailing strategy and shows the time frames when these capabilities can be available. This acquisition plan should be submitted to the Congress as part of DOD's next budget presentation.

SUBJECT INDEX

The following Index is a guide to the major subjects of the 17 reels. The Roman numeral refers to the reel, and the Arabic number refers to the frame number at which a particular study begins. Hence IV: 0717 directs the researcher to the study which begins at Frame 0717 of Reel IV. By referring to the Reel Index which comprises the initial section of this guide, the researcher can find the main entry for this study.

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VI: 0889; XII: 0620; XIII: 0167; XIV: 0740

Weapons systems

IX: 0315, 0424; XII: 0505; XVI: 0218

West Germany

III: 0442

UPA