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THE HISTORY OF NATO TNF POLICY: THE ROLE OF STUDIES, ANALYSIS AND EXERCISES CONFERENCE PROCEEDINGS

Volume 1
Introduction and Summary

R. L. Rinne, Editor
Sandia National Laboratories/California

ABSTRACT

This conference was organized to study and analyze the role of simulation, analysis, modeling, and exercises in the history of NATO policy. The premise was not that the results of past studies will apply to future policy, but rather that understanding what influenced the decision process—and how—would be of value. The structure of the conference was built around discussion panels. The panels were augmented by a series of papers and presentations focusing on particular TNF events, issues, studies, or exercises. The conference proceedings consist of three volumes. This volume contains the conference introduction, agenda, biographical sketches of principal participants, and analytical summary of the presentations and discussion panels. Volume 2 contains a short introduction and the papers and presentations from the conference. Volume 3 contains selected papers by Brig. Gen. Robert C. Richardson III (Ret.).

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CONFERENCE INTRODUCTION

As events in Poland indicated the beginning of change in Eastern Europe, the question was asked at a U.S./FRG bilateral meeting whether the large DoD/DOE computer-based theater conflict simulation models could be used to examine how NATO's Theater Nuclear Forces (TNF) might evolve. Professor Henry Rowen and Dr. Robert Rinne asked a more fundamental question: had studies, modeling, analysis, and exercises influenced NATO's TNF policy and force structure in the past, and if so, how? Given that today is better characterized by discontinuities than projections of past trend lines, modeling and simulation are likely to be of marginal value. On the other hand, it is worthwhile to develop a better understanding of the past process, of how issues were examined, and of who and what influenced the decision process. The outgrowth was support for this conference on the role of simulation, analysis, modeling, and exercises in the history of NATO policy. Again, the premise is not that the results of past studies will apply to future policy, but rather that understanding what influenced the decision process—and how—would be of value.

It has become clear that the closing decade of the century will be one of profound change in international security structures. We selected the examination of NATO nuclear policy for two fundamental reasons:

1. With the changes in Europe, the collapse of the Soviet Empire, German Unification, and the increasing solidarity and strength of the European Economic Community, TNF policy clearly will undergo significant change in the next few years, and
2. The forty years of European Nuclear Force development provide a contextual continuum where the basic objective stays constant with time but with several changes in policy and force structure that might provide an educational perspective.

Over the past four decades, there has been an almost continuous series of studies addressing the issues related to the feasibility, utility, force structure, and use of theater nuclear weapons. In the 1950s, the early focus was on a doctrine of "massive retaliation." A more flexible attitude was codified in MC14/2 in the mid-50s. The foundations for studies and analysis of the relationships among nuclear weapons, military doctrine, and political policy were developed in Southern California, for strategic systems at RAND, and in the theater force study, VISTA, at Cal. Tech. During the '50s, the military studied the structure for the Pentomic Division and conducted the "Sagebrush" and "Carte Blanche" exercises. With Soviet developments of IRBMs, a strategic bomber force, and the launch of Sputnik, the viability of massive retaliation came into serious question. The 1960s saw a number of studies on force structure and use (e.g., "Oregon Trail") leading to the "flexible response" strategy endorsed in MC14/3 in December 1967. Following the formation of the Nuclear Planning Group in February 1966, a number of studies were sponsored to address TNF issues resulting in a series of papers on "follow-on use." (As early as the spring of 1966, German and British studies were presented to the Nuclear Plannning Group.) In the 1970s the emphasis was on modernization. Within the

U.S. defense analysis community, numerous studies were directed toward enhanced radiation warheads. By the late '70s and during the first half of the 1980s, Long-Range Theater Nuclear Forces (LRTNF) were the dominant topic of analysis.

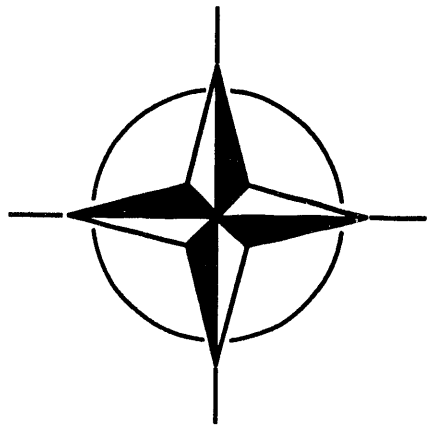
Past projects have investigated TNF modeling, gaming, exercises, and analysis. Generally these have been directed towards determining requirements for improving the techniques to understand TNF issues, with emphasis on developing new hardware or software. This conference examined the relationships from a more historical perspective: what was learned and how it was communicated to those responsible for making decisions; how TNF policy and force structure was determined; and how studies and analysis could have been directed and improved to aid those decisions.

During the three-day conference, we reviewed some aspects of NATO's history related to TNF decisions. Topics included:

- Why and how were decisions made?
- What information was available?
- What was used and what should have been used?
- What information would have been useful?
- How did useful information reach or how could it have reached those who were responsible for making decisions?

The structure of the conference was built around discussion panels focused on particular events or TNF issues. The advantage of the discussion panel approach over individual interviews was the "memory jogging" aspects of bringing together several individuals who had different responsibilities during and perspectives on the same event. It also provided the opportunity to explore the different approaches used by those with similar responsibilities but at different points in time. The panels were ordered roughly by era. However, individuals generally transcend breakdowns into simple time periods, and the panels were not necessarily a review of the papers that preceded them. The panels were directed by an "interviewer," a student of TNF history. The interviewer guided the discussion, capitalizing on the experience of the panel and drawing in the expertise of the audience. The panels were augmented by a series of papers focusing on particular TNF events, issues, studies, or exercises. These papers added an element of depth to the program.

Several formal records of the conference exist. The entire proceedings were videotaped, and copies of the tapes are archived at the conference sponsors' facilities and the DOE national laboratories. This document (three volumes) contains an unclassified summary of the conference by Professor David Yost of the Naval Postgraduate School and most of the papers. This volume contains the introduction, agenda, biographical sketches of participants, and analytical summary. Volume 2 contains a short introduction and the papers from the conference. Volume 3 contains selected papers provided by Brig. Gen. Robert C. Richardson III (Ret.) from his personal files.



The HISTORY of NATO TNF POLICY:
The Role of Studies, Analysis and Exercises

September 12, 13 and 14, 1990

Hosted by:

Sandia National Laboratories
Livermore, California

Sponsored by:

DoD Defense Nuclear Agency
DOE Office of Arms Control
DOE Office of Weapons Research, Development & Testing
DOE Office of Intelligence

DAY ONE: Wednesday, September 12

8:30 WELCOME to Sandia National Laboratories: **Dr. Orval E. Jones,** Executive Vice President, Sandia National Laboratories

8:45 INTRODUCTION to the Conference: **Dr. Robert L. Rinne,** Conference Program Manager

9:15 KEYNOTE: **Ambassador Paul H. Nitze**
Personal Recollections: TNF Policy & Force Structure Development

10:15 *Coffee Break*

Wednesday Facilitator: **Mr. Joseph Fromm**

10:30 PAPER 1: **Dr. Theodore S. Gold,** Vice President, Hicks and Associates
Topic: Military Studies Supporting the Pentomic Division

11:15 PAPER 2: **Dr. Patrick J. Garrity,** Center for National Security Studies, Los Alamos National Laboratories
Topic: NATO Policy and Force Structure in the early 1950s

12:00 *Lunch on the Patio*

1:00 **PANEL I**
INTERVIEWER:
Prof. David A. Rosenberg, Temple University
PANEL MEMBERS:
Prof. Herbert York, Institute on Global Conflict and Cooperation, UCSD
Prof. Robert R. Bowie, Dillon Prof. Emeritus, Harvard University
Mr. John H. Morse
Brig. Gen. Robert C. Richardson III (Ret), High Frontier

2:30 *Refreshment Break*

3:00 OVERVIEW: **Mr. Phillip A. Karber,** Vice President, BDM Corporation
Revisiting the Interplay Among TNF Policy, Studies & Exercises

4:30 *Adjourn*

5:30-7:00 *NO HOST SOCIAL at the HILTON HOTEL, Pleasanton*

DAY TWO: Thursday, September 13

Thursday Morning Facilitator: **Dr. Wolfgang Krieger**

8:30 PAPER 3: **Ms. Kori Schake,** University of Maryland
Topic: TNF and the Berlin Crisis

9:15 PAPER 4: **Gen. Johannes Steinhoff (Ret)**
Topic: The Sword/Shield Strategy of the Early 1960s

10:00 *Coffee Break*

10:30 **PANEL II**
INTERVIEWER:
Prof. Catherine M. Kelleher, Director, International Security Studies, University of Maryland
PANEL MEMBERS:
Brig. Gen. Robert C. Richardson III (Ret), High Frontier
Gen. Johannes Steinhoff (Ret)
Ambassador Seymour Weiss

12:00 *Lunch on the Patio*

Thursday Afternoon Facilitator: **Mr. Charles Winter**

1:00 PAPER 5: **Mr. Joachim E. Scholz,** President, Orion Research Inc.
Topic: The Oregon Trail Study

1:45 PAPER 6: **Mr. Garry Brown,** Supervisor, Sandia National Laboratories
Topic: The NATO Follow-on-use Studies

2:30 *Refreshment Break*

3:00 **PANEL III**
INTERVIEWER:
Mr. Christopher Makins, Aspen Institute for Humanistic Research
PANEL MEMBERS:
Sir Frank Cooper
Mr. Don Cotter
Mr. Walter Slocombe
Mr. Leon Sloss, President, Leon Sloss Associates Inc.

4:30 *Adjourn*

DAY Three: Friday, September 14

Friday Facilitator: **Dr. Robert L. Rinne**

8:30 PAPER 7: **Dr. Lynn E. Davis,** Johns Hopkins Foreign Policy Institute
Topic: NATO Requirements and Policy for LRTNF

9:15 PAPER 8: **Dr. Joe Braddock and Gen. Donn Starry (Ret)**
Topic: The Development of the Follow-on-Force Attack Strategy

10:00 *Coffee Break*

10:30 **PANEL IV**
INTERVIEWER:
Dr. Robert L. Pfaltzgraff, Pres., Institute for Foreign Policy Analysis
PANEL MEMBERS:
Dr. Lynn E. Davis, Fellow, Johns Hopkins Foreign Policy Institute
Gen. Donn Starry (Ret)
Gen. William Y. Smith (Ret), Institute for Defense Analysis
Dr. James A. Thomson, President, RAND Corporation
Dr. Richard L. Wagner, Vice President, Kaman Science Corporation

12:00 *Lunch on the Patio*

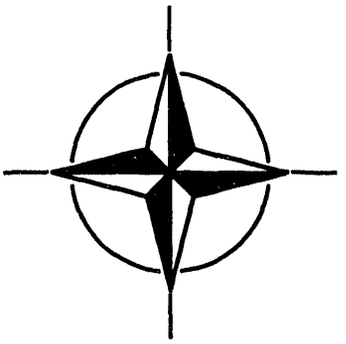
1:00 PAPER 9: **Maj. Gen. E. B. Atkeson (Ret),** Adj. Prof. Defense Intelligence College
Topic: The Evolution of Soviet TNF Thinking

1:45 PAPER 10: **Mr. R. Stivers,** General Partner, Advanced Planning Association
Topic: Studies, Analysis and Exercises Influence in Defining TNF Requirements

2:30 *Refreshment Break*

3:00 **CLOSE OUT PRESENTATION**
Prof. Laurence W. Martin, Vice Chancellor, University of Newcastle-upon-Tyne

4:00 *Adjourn*



THE HISTORY OF NATO TNF POLICY:

THE ROLE OF STUDIES, ANALYSIS AND EXERCISES

Biographies of Principal Participants

Major General Edward B. Atkeson
U.S. Army, Retired

Edward B. Atkeson is a senior fellow at the Institute of Land Warfare, Association of the U.S. Army, and an adjunct professor at the Defense Intelligence College. During his military service he served as Deputy Chief of Staff Intelligence, U.S. Army Europe, and later as National Intelligence Officer for General Purpose Forces on the staff of the Director of Central Intelligence. He has also served with the Bureau of Politico-Military Affairs, Department of State, and as Commander of the U.S. Army Concepts Analysis Agency.

He holds a BS degree from the U.S. Military academy and an MBA from Syracuse University. He is a graduate of the U.S. Army War College and subsequently served as deputy commandant of that institution. He was a fellow at the Center for International Affairs, Harvard University, from 1973 to 1974.

Professor Robert R. Bowie
Dillon Professor Emeritus of International Affairs
Harvard University

Robert R. Bowie, currently retired, has served as: Deputy to the Director of the Central Intelligence Agency for National Intelligence; Director of the Center for International Affairs, 1957–72, and Clarence Dillon Professor of International Affairs, 1957–77, Harvard University; U.S. High Commission for Germany, 1950–51; Director, Policy Planning Staff, Department of State, 1953–55; and Assistant Secretary of State, 1955–57.

Dr. Joseph V. Braddock
Corporate Vice President, BDM Corporation

Joseph V. Braddock's position involves both corporate and program responsibilities in leading-edge U.S. and allied technology programs, particularly those which provide near- and mid-term military capabilities.

He guides threat assessments, systems analyses, and requirements definition programs that relate to operational needs and technological advancements.

He earned his BS degree in Physics at St. Peter's College and his MS and PhD at Fordham University. He has published over 250 classified reports and papers dealing with systems and technology issues.

Currently, he is a member of the Defense Science Board. He served on the Army Science Board from July 1977 to July 1984, on the Scientific Advisory Group on Effects for the Defense Nuclear Agency from February 1978 to July 1985, and on the National Security Agency Scientific Advisory Board from September 1977 to January 1983. He also served on the Board of Trustees of the National Security Industrial Association from 1981 to 1988.

Mr. Garry S. Brown
Supervisor, Tactical Studies Division
Sandia National Laboratories

Garry S. Brown joined Sandia in 1967 and has spent most of his career in studies-oriented positions. In 1969 he entered the Tactical Nuclear Systems Analysis Division specializing in studies of requirements and weapons effects. He moved to Sandia Livermore in 1975 to lead a Tactical Nuclear Studies Division focused on Army nuclear weapons employment issues. This division developed a version of DIVWAG for the study of nuclear problems and used it successfully on a number of large studies including joint activities with the US V Corps staff from 1977 to 1980. He was an invited speaker at the 1978 CENTAG Commander's Conference to describe these activities.

In 1978 he was assigned the Sandia Albuquerque Pre-Phase 3 Studies Division responsible for developing preliminary nuclear designs for all applications.

Since 1982 he has led a Tactical Studies Division whose activities have included major studies of advanced conventional munitions, the balance of air and land power in the central region, nuclear policy in NATO, and TNF modernization requirements and issues. He is currently an active participant in studies and exchanges with the UK, the FRG, NATO, and the US nuclear studies community.

The Right Honorable Sir Frank Cooper
Former Under Secretary of State
U.K. Ministry of Defense

Frank Cooper was in the British Air Ministry from 1948–64, mostly working on Air Staff Policy including Nuclear Policy issues. Subsequently most of his career was spent in the Ministry of Defense including seven years as Permanent Under Secretary of State. During this period he was closely connected with the development of Defense Policy including nuclear matters both in Britain and in NATO.

Dr. Lynn E. Davis
Fellow, The Johns Hopkins Foreign Policy Institute

Lynn E. Davis is currently a Fellow at The Johns Hopkins Foreign Policy Institute, where she has just completed a study entitled "Assuring Peace in a Changing World." This study defines the critical choices for the West in designing its future strategic and arms control policies, for conventional and nuclear forces in Europe and then for strategic nuclear forces.

She was Director of Studies at the International Institute for Strategic Studies in London from 1985–87. She also edited the Institute's journal *Survival*. She served during the Carter Administration in the Department of Defense where she was Deputy Assistant Secretary for Policy Planning. She has held teaching positions at Columbia University and the National War College. Among her publications, "Lessons of the INF Treaty," *Foreign Affairs*, Spring 1988; "Nuclear Arms Control: Where do We Stand?" with Harold Brown, *Foreign Affairs*, Summer 1984; *Limited Nuclear Options: Deterrence and the New American Doctrine*, Adelphi Papers, IISS, 1976; *The Cold War Begins, Soviet-American Conflict Over Eastern Europe*, Princeton University Press, 1974.

Mr. Joseph Fromm
Chairman, U.S. Committee of The International Institute for Strategic Studies

Joseph Fromm served for many years as a foreign correspondent and editor of U.S. News & World Report. He is a Fellow at The Johns Hopkins School of Advanced International Studies and consultant to several research organizations. At SAIS he is co-chairman of a policy study group on the media and foreign policy. He retains a relationship with U.S. News & World Report and also is a contributor to the Christian Science Monitor.

A founding member of the London-based International Institute for Strategic Studies, he is a member of the Institute's governing Council as well as Chairman of the U.S. Committee. He is a member of the Board of Advisors of the Patterson School of Diplomacy at the University of Kentucky. He has lectured frequently on U.S. foreign and strategic policy at Britain's Royal Defence Studies, the Royal

Institute of International Affairs, the Canadian Defence College, the National Security Agency, the Central Intelligence Agency and World Affairs' Council groups, and other foreign affairs' organizations across the country.

He served in World War II as a volunteer in the British Eighth Army in North Africa and Italy and later was commissioned as a captain in a Gurkha regiment in the Indian Army, with assignment to the staff of the Commander-in-Chief. He has been awarded the Order of the British Empire by Queen Elizabeth II.

Dr. Patrick J. Garrity
Center for National Security Studies
Los Alamos National Laboratory

Patrick J. Garrity is currently a Staff Member with the Center for National Security Studies at the Los Alamos National Laboratory, where he specializes in nuclear weapons policy and arms control issues. He has a PhD in Government from Claremont Graduate School, has been a Research Fellow at the Center for Strategic and International Studies, and has taught at the Naval Postgraduate School and Catholic University. He is co-editor of the forthcoming book, *The Future of Nuclear Weapons.*

Dr. Theodore S. Gold
Senior Vice President, Hicks & Associates

Theodore S. Gold, prior to joining Hicks & Associates, established and managed a National Security Studies Group for the consulting firm of Booz-Allen and Hamilton.

From January 1982 to June 1984, he served as Deputy Assistant to the Secretary of Defense responsible for chemical warfare deterrence programs. He developed the Department of Defense's program encompassing research, development, and procurement of defensive and retaliatory systems and demilitarization of obsolete weapons and agents. He was also a major participant in the nation's chemical arms control initiatives.

Prior to his government service, he had 20 years of research, design, analysis, and management at Sandia National Laboratories. From December 1979 through 1981, he served on a special assignment in the Office of the Secretary of Defense where he participated in long-term planning, strategic force modernization, and government reorganization activities. His management responsibilities at Sandia focused on system and requirements analysis. He also managed the Livermore site computing center, applied mathematics and programming organizations, and nuclear weapon safety and reliability activities.

The Department of Energy awarded him its Distinguished Associate Award for his leadership of a comprehensive study of the Nuclear Weapons Program. He has both sponsored and served on National Academy of Science and Defense Science Board studies of national security issues. He recently served on a working group for the Commission on Integrated Long-Term Strategy and is co-author of its report on Extended-Range Smart Weapons.

Dr. Orval E. Jones
Executive Vice President
Sandia National Laboratories

Orval E. Jones is responsible for Sandia's technical programs including nuclear weapons, treaty verification, advanced energy technologies, physical security safeguards, satellite instrumentation, nuclear reactor safety, and advanced conventional munitions. Previously he was Vice President, Defense Programs, and Vice President, Technical Support.

He received his doctorate in Mechanical Engineering and Physics in 1961 from the California Institute of Technology where he was a National Science Foundation Fellow. Following graduation he joined the staff of Sandia National Laboratories to conduct research on shock waves in solids.

Dr. Phillip A. Karber
Vice President, National Security Programs
BDM Corporation

Phillip A. Karber is BDM's Corporate Vice President for National Security Programs (which includes the NATO Studies Center) and Director of the newly established BDM Center for Technology and Public Policy Research. In these capacities he directs BDM's work in strategic and conventional arms control policy and verification, global and regional military net assessments, corporate strategic planning, and national policy development in such fields as technology innovation, transportation, and international economic competitiveness.

Between 1968 and 1971, as national security advisor to Congressman Craig Hosmer, the ranking minority member of the Joint Committee on Atomic Energy, he was involved in the early debates on nuclear nonproliferation, SALT I, ABM, and decisions on MIRV, the enhanced radiation warhead, and Trident.

He has been with BDM International since 1971. During the 1970s, he continued to serve as a congressional consultant and led the National Security Study Memorandum task force on the US/Soviet and NATO/Warsaw Pact conventional military balance. A member of the U.S. Army Science Board, he participated in the Army's first Battlefield Development Plan and the Chief of Staff's original High Technology Light Division study.

Between 1981 and 1983 he was the founding director of the Department of Defense Strategic Concepts Development Center chartered "to provide advice to the Secretary of Defense and Chairman of the Joint Chiefs of Staff on matters of strategy development."

As adjunct Professor of National Security Studies, he taught "The Military Problems of NATO" at the Georgetown University graduate school.

He regularly briefs the Senate and House Armed Services committees on the facts and implications of arms control and related developments in Europe. In Summer 1989, he traveled to the Soviet Union as an advisor to a House Armed Services Committee delegation.

He is a native of California. A former Marine, educated at Pepperdine, Harvard, and Georgetown Universities, he was a Fellow at the Center for Strategic and International Studies and is an alumnus of the John F. Kennedy School of Government, Harvard University.

Professor Catherine M. Kelleher
Director, Center for International Security Studies
University of Maryland

Catherine M. Kelleher is Director of the Center for International Security Studies at the University of Maryland (CISSM) and a professor in the School of Public Affairs at that university. She came to the school from a post at the National War College. She received her undergraduate training at Mt. Holyoke College and her doctorate in Political Science from Massachusetts Institute of Technology. Her governmental experience includes a position on the National Security Council staff during the Carter Administration and consulting assignments under Republican and Democratic administrations in the Office of the Assistant Secretary of Defense for International Affairs, the Arms Control and Disarmament Agency, and the Department of the Army. She has published widely in the field of national security and arms control studies and has been active in the design and implementation of programs to broaden education in this field. She is currently a Visiting Fellow at the Brookings Institution.

Mr. Christopher J. Makins
Vice President, The Aspen Institute

Christopher J. Makins is currently responsible for policy programs of The Aspen Institute. He is also an Assistant Vice-President in The National Security Studies and Systems Group at Science Applications International Corporation. Furthermore, in partnership with Robert Ellsworth, former Deputy Secretary of Defense, Chris is the author of a newsletter on U.S. foreign economic and defense policy.

He was the Director, International Security Programs, Roosevelt Center for American Policy Studies (1984–88), Director of Programs on Western European Trends, Carnegie Endowment for International Peace (1977–79) and Deputy Director of the Trilateral Commission (1975–76). From 1964 to 1975 he was a member of Her Majesty's Diplomatic Services. He received both his BA and MA degrees from New College, Oxford.

Professor Laurence Martin
Vice Chancellor, University of Newcastle-upon-Tyne

Laurence Martin was professor of war studies at King's College, London before becoming vice chancellor of the University of Newcastle-upon-Tyne. In the United States he has done research and taught at Yale and the Massachusetts Institute of Technology. Among his books are *The Two-Edged Sword, The Sea in Modern Strategy, British Defence Policy, America and the World,* and *Arms and Strategy: An International Survey of Modern Defence.*

Mr. John H. Morse
Former Head of Nuclear Planning Division, SHAPE

Jack Morse was the head of the Nuclear Planning Division, Supreme Headquarters Allied Powers Europe (SHAPE). Jack served as Special Assistant Chairman of the Atomic Energy Commission and as Deputy Assistant Secretary of Defense. He was one of the Directors in 1952 of PROJECT WHISKEY to develop the first SACEUR nuclear weapon target list. He lead the team that developed SACEUR's first Nuclear Weapon Control Policy.

He has been a senior analyst at Stanford Research Institute and was one of the founders of High Frontier. He is a retired naval aviator. An aeronautical engineer, he has been a lecturer at the Army, Navy, and Air War Colleges.

Ambassador Paul H. Nitze
Ambassador-at-Large, Retired

Paul H. Nitze has been diplomat in residence at the Paul H. Nitze School of Advanced International Studies, The Johns Hopkins University, in Washington, DC, since his retirement from the State Department on April 30, 1989.

From January 24, 1985, he served as Special Advisor to the President and the Secretary of State on Arms Control Matters. On May 16, 1986, President Reagan also appointed him Ambassador-at-Large, the position in which he served until his retirement. He was awarded the Presidential Medal of Freedom by President Reagan on November 7, 1985, for his contribution to the freedom and security of his country.

Prior to this assignment, he was head of the United States Delegation to the Intermediate-Range Nuclear Forces Negotiations with the Soviet Union, which convened in Geneva on November 30, 1981.

During the preceding seven years, he was a consultant on defense policy and the U.S./Soviet strategic relationship to various government departments and private firms. He also served as Chairman of the Advisory Council of The Johns Hopkins School of Advanced International Studies; Director on the Boards of Aspen Skiing Corporation, Twentieth Century-Fox Film Corporation, Schroders, Inc., American Security and Trust Company, the Ethics and Public Policy Center, and the Atlantic Council of the United States; Chairman of Policy Studies, Committee on the Present Danger; and is now Trustee Emeritus of The Johns Hopkins University, the Aspen Institute for Humanistic Studies, and the George C. Marshall Research Foundation.

During the previous thirteen years he served in several positions within the Department of Defense. He was Assistant Secretary of Defense (International Security Affairs) from January 1961 until President John F. Kennedy appointed him the 57th Secretary of the Navy in November 1963, a position he held until July 1967. From July 1967 until January 1969, he was the Deputy Secretary of Defense, succeeding Cyrus Vance in that position. From the Spring of 1969 until his resignation in June 1974, he served as the representative of the Secretary of Defense on the United States Delegation to the Strategic Arms Limitation Talks with the Soviet Union.

During the period 1944 through 1946, he was Director, then Vice Chairman, of the United States Strategic Bombing Survey. He was awarded the Medal of Merit by President Truman for service to the nation in this capacity. From 1941 until 1943, he was Chief of the Metals and Minerals Branch of the Board of Economic Warfare, until named Director of the Foreign Procurement and Development for the Foreign Economic Administration.

Graduated in 1928 from Harvard, he subsequently joined the New York investment banking firm of Dillon, Read and Company. In 1941 he left his position as Vice President of that firm to come to Washington to join the war effort to become Financial Director of the Office of the Coordinator of Inter-American Affairs.

Dr. Robert L. Pfaltzgraff, Jr.
President, The Institute for Foreign Policy

Robert L. Pfaltzgraff Jr., in addition to directing the activities of the Institute for Foreign Policy, is the Chairman of National Security Planning Associates and the Shelby Cullom Davis Professor of International Security Studies, the Fletcher of Law and Diplomacy, Tufts University.

He is an authority on issues of U.S. national security policy, alliance relationships, hemispheric security concerns, and military planning. He has written and lectured widely on the issues of alliance policies and strategy, the interrelationships of political, economic, and security policies, technology transfer, arms control, international relations theory, U.S. foreign policy, and the implications for western nations of emerging trends in both regional and global security environments.

Brigadier General Robert C. Richardson III
Deputy Director, High Frontier

Robert C. Richardson is currently Deputy Director, High Frontier, Inc. A 1939 USMA graduate, he served over 28 years in the U.S. Air Force. In World War II he was Commander of Ascension Island Defense Squadron and Commander of 365th Righter Group, European Theater. Military assignments after the war included Joint Strategic Plans Group (U.S. JCS) and first NATO Standing Group in the late 1940s, U.S. military representative with the European Army Treaty Conference, and member of General Eisenhower's NATO planning staff at SHAPE headquarters in Paris in the early 1950s.

In 1956, he commanded the 83rd Fighter Wing, Tactical Air Command at Seymour Johnson AFB, N.C. (1956–58) and was Assistant to the Chief of Staff for Long Range Planning, Hqs. USAF, (1958–61). In June 1961 he returned to NATO in Europe, first as Director of Operations for the Tripartite Berlin Plans Group "Live Oak" during the 1961 Berlin Crisis, and then as Deputy Military Representative with the North Atlantic Council.

He was assigned to the USAF Systems Command in 1964 where he served in plans and as Deputy Chief of Staff for Science and Technology. He subsequently became Deputy Commander of the Defense Atomic Support Field Command, Sandia Base, N.M., until he retired from the Air Force in 1967.

In the late 1970s he returned to public policy research and consulting activities on U.S. national security issues, working as a consultant to the American Enterprise Institute and American Security Council, as the Director of the American Foreign Policy Institute, and as Secretary of the Security and Intelligence Fund.

Dr. Robert L. Rinne
Advisor for Strategic Planning
Sandia National Laboratories

Robert L. Rinne has been the Staff Advisor for Strategic Planning to the Director of Weapon Development at Sandia's Livermore location since 1988. He joined Sandia in 1966 as a Member of the Technical Staff in the Systems Research Department. Following a special assignment in 1972–73 to the Atomic Energy Commission in Germantown, Maryland, he was a Supervisor in the Systems Studies Department (1973–80) and its manager from 1981 to 1988. He has directed studies on strategic and theater nuclear issues, counter terrorism and energy systems. In 1984, together with Mr. Uwe Nerlich, Director of Research at the Stiftung Wissenschaft und Politik, he established the European Conflict Analysis Program (ECAP).

He was granted a BA (1969) in Mathematics from the University of California, Riverside and an MA (1966) from the University of Virginia under a DuPont Fellowship. He received his PhD (1971) with a dissertation in Algebraic Topology from the University of Virginia through Sandia's Doctoral Study Program.

Dr. Joachim E. Scholz
President, Orion Research, Inc.

Joachim E. Scholz, in the Office of the Secretary of Defense, at the National Security Council, and in the Department of the Air Force, has been instrumental in policy development for nuclear force employment and targeting; establishment of acquisition requirements for theater and strategic offensive and defensive forces; analysis and simulation of strategic systems and their associated command, control, communications and intelligence; description of concepts of operation; definition of continuity of government concepts; and simulation model development.

He graduated with a degree in mathematics from the Louisiana Polytechnic University and holds a Master of Science degree in operations research from the School of Engineering at the Air Force Institute of Technology. He is fluent in German.

Mr. Walter Slocombe
Former Deputy Under Secretary
of Defense for Policy Planning (1979–80)

Walter Slocombe has been a member of the Washington, DC, law firm of Caplin & Drysdale, Chartered, since February 1981. Prior to rejoining the firm, he served as Deputy Under Secretary of Defense for Policy Planning and Director of the DoD SALT Task Force. He assumed that position on November 1, 1979, after serving as

Principal Deputy Assistant Secretary of Defense, International Security Affairs, and DoD SALT Task Force Director from January 1977.

In 1970–71 he was a Research Associate at the International Institute for Strategic Studies in London. In 1969 and 1970 he was a member of the Program Analysis Office of the National Security Council staff. He clerked for Mr. Justice Abe Fortas during the October 1968 term of the United States Supreme Court.

He is author of *The Political Implications of Strategic Parity* (ISS Adelphi Paper No. 77, 1971), "The Countervailing Strategy," (*International Security*, Spring 1981), "Extended Deterrence" (*Washington Quarterly*, Fall 1984), and other papers and articles on defense policy and tax law. He has served on the Advisory Councils of the Georgetown University Center for Strategic and International Studies, the Woodrow Wilson School of Public and International Affairs at Princeton University, the National Security Archive, and the CNA Strategic Policy Analysis Group.

He was born in 1941 and grew up in Ann Arbor, Michigan. He graduated in 1963 from Princeton University, where he was in the Woodrow Wilson School. From 1963–65 he did graduate study on Soviet politics as a Rhodes Scholar at Balliol College, Oxford. He received his law degree in 1968 from Harvard Law School.

Mr. Leon Sloss
President, Leon Sloss Associates, Inc.

Leon Sloss received his AB from Stanford University and his MPA from the Woodrow Wilson School of Princeton University. He has served as Director of International Security Policy and then Assistant Director in the Bureau of Politico-Military Affairs, Department of State. In 1976–77 he was Assistant Director (and later Acting Director) of the Arms Control and Disarmament Agency (ACDA). Mr. Sloss also served as head of the U.S. delegation to the Seabed Treaty Arms Control Review Conference in Geneva. After working as Vice President of SRI International and directing a special study of nuclear targeting policy for the Secretary of Defense, he started his own consulting firm in 1981, which does studies of defense policy and arms control issues.

General W. Y. Smith
U.S. Air Force, Retired
President, Institute for Defense Analyses

W. Y. Smith retired from the U.S. Air Force in 1983 after 35 years as a career officer. General Smith graduated from West Point in 1948 and holds both an MA and a PhD degree from Harvard University.

He flew in Korea as a fighter bomber pilot until he was seriously wounded on his 97th combat mission. Washington staff posts included serving as assistant to General Maxwell D. Taylor, both at the White House under President Kennedy and at the Joint Chiefs of Staff, Assistant to Mr. McGeorge Bundy on the National Security Council, Military Assistant to Secretaries of the Air Force Harold Brown and Robert Seamans, and Assistant to the Chairman of the Joint Chiefs of Staff under both General George S. Brown and General David C. Jones (1975–79). His

responsibilities included NATO and nuclear arms control considerations (1962–64); nuclear planning for U.S. Air Forces, Europe (1965–67); Director of Policy Plans in OSD, ISA (1974–75).

His European command and staff assignments included appointments as Chief of Staff, Supreme Headquarters Allied Powers Europe (SHAPE 1979–81) and Deputy Commander-in-Chief of the United States European Command (DCINC, EUCOM (1981–83). He is currently the President of the Institute for Defense Analyses (IDA).

General Johannes Steinhoff
German Air Force, Retired

Johannes Steinhoff served as a fighter pilot during World War II. In 1944 he was named to command the first German Air Force jet fighter wing. He crashed and was severely injured in April 1945.

From 1952 to 1954, he was a member of the German Delegation to the European Defense Community. From 1957 to 1960 he was the Assistant Chief of Air Staff (Plans). From 1960 to 1963 he was the German Permanent Military Representative, MC/NATO. In 1964 he was in command of the 4th German Air Force Division. In 1965 he was appointed Chief of Staff, Allied Air Forces Central Europe (AIRCENT). From 1966 to 1970 he was Chief of German Air Staff. From 1971 to 1974 he was the Chairman of NATO's Military Committee. His military decorations include The Knight's Cross of the Iron Cross with Oak Leaf Clusters and Crossed Swords.

In the 1980s he has been the Chairman of the Board of Trustees, DORNIER Co., a member of the Board of Trustees, WOMA Co., Governor of the Atlantic Institute for International Affairs and editor of "NATO's Sixteen Nations."

Mr. Ronald H. Stivers
General Partner, Advanced Planning Associates

Ronald Stivers has had extensive experience in planning and policy development at the Department of Defense, serving in a number of positions in the Office of the Secretary of Defense. He left the Department of Defense in April 1988, where he was serving as the Assistant Undersecretary for Policy. In this position he had been the Director of Nuclear Targeting Policy for a period of over eight years. Prior to his work at Defense, he had been the Senior Soviet Analyst at the Central Intelligence Agency. He is currently associated with Western Research and Advanced Planning Associates as a General Partner.

Dr. James A. Thomson
President and CEO of RAND Corporation

James A. Thomson, a member of the RAND staff since 1981, has served the institution in a variety of roles — as director of RAND's research program in national security, foreign policy, defense policy, and arms control (1981–85); as vice president in charge of the Project AIR FORCE division (1984–88), which performed studies and analysis on the range of issues important to the future of the U.S. Air

Force; and as executive vice president (1989). Jim also conducts research on nuclear deterrence and on European security.

From 1977 to January 1981, he was a member of the National Security Council at the White House, where he was primarily responsible for formulating policy on defense and arms control matters related to Europe—NATO defense planning, bilateral defense relationships with European allies, and the modernization of theater nuclear forces, arms control, and U.S. defense programs related to Europe. For example, he initiated and directed the U.S. government analysis that led to the 1979 decision to deploy INF. He coordinated U.S. efforts to obtain NATO agreement to this deployment, serving on diplomatic assignments.

Dr. Richard L. Wagner, Jr.
Vice President, Kaman Corporation

Richard L. Wagner, Jr. served as Assistant to the Secretary of Defense for Atomic Energy from 1981–86, with responsibility for oversight of DoD's nuclear weapon acquisition planning, nuclear weapon surety, control and survivability, and the DoD/DOE interface in nuclear weapon R&D procurement. Prior to joining DoD, he was at the Lawrence Livermore National Laboratory from 1963–81, where he worked in a wide variety of nuclear weapon developments. He was involved in the BMD programs in the 1960s, was leader of one of two weapon design physics divisions, was Associate Director for Nuclear Testing, and was the Laboratory Associate Director. He has been a member of the Defense Science Board, the DNA Science Advisory Group on Effects, the Joint Strategic Target Planning Staff's Science Advisory Group, and the Army Science Board. Since 1986 he has been with the Kaman Corporation, where he is Group Vice President for Science & Technology. His undergraduate degree is from Williams College, and he earned a PhD in physics from the University of Utah in 1963.

Ambassador Seymour Weiss
Ambassador to the Bahamas, Retired

Seymour Weiss served as a Naval Commissioned Officer in World War II, receiving combat ribbons for the Atlantic and Pacific Theaters.

He joined the International Division of the Office of Budget and Management in 1949. He subsequently served in the Agency for International Development where, as Director for Military Assistance Coordination, he was the principal official in charge of coordinating U.S. military assistance programs with U.S. foreign political and economic policies.

In 1954 he joined the Department of State. He was Director of the Office of Politico-Military Policy, Director of the Office of Strategic Intelligence and Research, Special Assistant to the Secretary of State, Deputy Director of the Policy Planning Staff and eventually with the rank of Assistant Secretary of State served as Director of the State Department's Bureau of Politico-Military Affairs.

In 1974 he was appointed Ambassador to the Bahamas where he served until December 1976.

He has served on many senior level studies and panels including the McCloy Study of U.S. Forces in Europe, the Acheson Study of the Future of NATO and a Study of Soviet Military Programs and Political Motivations, commissioned in 1976 by the President's Foreign Intelligence Advisory Board (the so-called Team B Study). Included among the panels on which he has served or is serving are the Chief of Naval Operations Executive Panel, the Army Science Board, the Strategic Air Command Science Advisory Group, the Defense Nuclear Agency Science Advisory Group on Effects, The Congressional Office of Technology Assessment Panel and the Army Interagency Council. He was appointed by President Reagan as a member of the President's Foreign Intelligence Advisory Board where he served until 1986.

He is presently Chairman of the Defense Policy Board and a advisory panel which reports to the Secretary of Defense on politico-military policy issues.

Professor Herbert F. York
Director (Retired) Institute on Global Conflict and Cooperation, U.C. San Diego

Herbert F. York received his AB from the University of Rochester and his PhD in physics from the University of California at Berkeley and has been a professor of physics in the UC system since 1951. He served as Director of the Lawrence Livermore Radiation Laboratory, Livermore, California, in 1952–58. He was a science advisor to Presidents Eisenhower and Kennedy and, in 1958–61, served as Director of Defense Research and Engineering in the Office of the Secretary of Defense. In 1962–69 he was a member of ACDA's General Advisory Committee. Later, he served as U.S. Ambassador to the Comprehensive Test Ban Negotiations in 1979–81 and was also special representative of the Secretary of Defense at the Space Arms Control Talks of 1978–79. Since 1972, he has also been the Director of the Program on Science, Technology, and Public Affairs at the University of California at San Diego.

Professor David S. Yost
Associate Professor, U.S. Naval Postgraduate School

David Yost is an Associate Professor at the U.S. Naval Postgraduate School, Monterey, California. He worked in the Department of Defense, primarily in the Office of Net Assessment, in 1984–86, under the auspices of fellowships from NATO and the Council on Foreign Relations. He has been a fellow in international security studies at the Woodrow Wilson International Center for Scholars, Smithsonian Institution, and a visiting scholar at the School of Advanced International Studies, Johns Hopkins University. During the academic year 1990–91, he will be in Paris as a Fulbright Research Fellow at the Institut Français des Relations Internationales (IFRI) and the École Polytechnique's Centre d'Études des Relations entre Technologies et Stratégies (CREST).

ANALYTICAL SUMMARY
OF CONFERENCE PROCEEDINGS

by David S. Yost*

*Professor, Naval Postgraduate School, Monterey, California, and (during the 1990–91 academic year) a Fulbright Research Fellow in Paris. The views expressed do not represent those of the Department of the Navy or any other U.S. government agency.

SUMMARY CONTENTS

Introduction

This report summarizes the main points made in the conference presentations and panels. Because several of the principal speakers provided papers that are published in Volume 2 of these proceedings, this summary devotes particular attention to the speakers who did not provide papers (such as Ambassador Paul Nitze) and to the panel discussions. Although the conference was videotaped and verbatim transcripts of the proceedings may eventually be prepared, this unclassified report may serve as the most readily accessible account of the event for many readers. The participants did not, of course, always agree with the views and opinions expressed by others.

Dr. Robert L. Rinne opened the conference by noting that it originated in questions raised two years ago by Henry Rowen with respect to the future of the Warsaw Pact and NATO: Could modeling help in the examination of alternative futures? To what extent have modeling and analysis helped in policy decisions? Have studies had much of an impact, even in policy areas that have received a relatively large amount of analytical attention, such as nuclear deterrence in Europe?

NATO TNF policy will change significantly in light of the recent and prospective changes in Europe, including the unification of Germany, the virtual collapse of the Warsaw Pact, and the deepening of political and economic integration in the European Community. The purpose of the conference was to advance understanding of the NATO TNF policies of the past, with an emphasis on the role of studies, analysis, and exercises in decision-making, in order to provide a better foundation for future policy choices.

"Personal Recollections: TNF Policy and Force Structure Development" by Ambassador Paul H. Nitze

Ambassador Nitze, the keynote speaker, recalled that the Pacific report of the U.S. Strategic Bombing Survey included an examination of the effects of nuclear weapons. It concluded that the nuclear weapons then available increased the destructive power of a bomber 150 to 200 times. Although some argued that nuclear weapons would radically change the nature of warfare, responsible officials did not hold this view. They held that in the nuclear age there would be continuing problems of intelligence, research and development, peacetime readiness to respond to surprise attack, and active and passive defenses. In 1945–49, the U.S. monopoly in nuclear weapons was widely assumed to provide almost absolute security, but this was a mistaken assumption. Only three men in the State Department knew that the U.S. had only a few weapons and that they could not be effectively used to stop a Soviet advance in Europe or Asia. Deterrence was recognized as the name of the game in the nuclear age.

After the first Soviet nuclear explosive test in 1949 (which occurred much earlier than the U.S. had anticipated), the race was underway in numbers, yield, and other capabilities. Without better U.S. defenses and counterforce capabilities to degrade Soviet offensive forces, the Soviets could deter the U.S. from initiating an attack. An attack on 100 U.S. cities with nuclear weapons would be intolerable for the U.S.

In the early 1950s, allied concern about Soviet conventional forces led to interest in tactical nuclear weapons. Theater nuclear forces appeared attractive as long as the Soviets did not have such a capability; but it was obvious that they would eventually have such forces and that bilateral TNF employment on the territory of allies would be a "mug's game" for NATO.

The issue of whether to link TNF employment to the strategic forces was also posed. In his 1957 book, *Nuclear Weapons and Foreign Policy*, Henry Kissinger proposed isolating TNF operations in Europe from U.S. strategic forces. (Incidentally, Kissinger understood little about TNF; he talked about using 500-kt weapons and keeping cities as sanctuaries.) The issue arose in another form during the political debate that began in the late 1970s about what were then called LRTNF (long-range theater nuclear forces). The term TNF became increasingly unacceptable to Europeans, because it implied that "theater" weapons were separate from "strategic" weapons. In their view, the effect of the term was to assume decoupling. Would this European view or the early Kissinger view be accepted? The U.S. decided to favor linkage.

Therefore, the U.S. and its allies had to be prepared for virtual suicide in the event of using nuclear weapons. This would scare the Soviets; however, NATO officials felt sure that they would not be called upon to exercise the option because there was no prospect of host countries authorizing use of nuclear weapons. Moreover, the Pershing II missiles were vulnerable to attack. One-third of the Pershing II force was supposed to be on the road at all times; but this movement was not possible because of public opinion in West Germany. Therefore, the force consisted of "sitting ducks" that, in theory, could only be used in a first strike before their neutralization by Soviet attacks. NATO knew that it would not (and could not practically) use them in a first strike; but, the Soviets thought that NATO could use them, that the Pershing II's range had been extended so that it could reach Moscow, and that it had an earth-penetrating warhead. Although none of these Soviet assumptions were accurate, the Pershing IIs had a stronger deterrent effect because of them.

In recent years, Mikhail Gorbachev, Victor Karpov, and other Soviet officials have acknowledged that the SS-20 deployments were a mistake because they threatened and frightened all of Europe. European fears were justified; they provoked the U.S. Pershing II and ground-launched cruise missile (GLCM) programs, which in turn caused fear in the Soviet Union and East-West tension and confrontation. The "walk-in-the-woods" formula would have been a better result than the "zero option" for INF missiles, but Kvitsinsky was mistaken in thinking that he could convey it directly to Brezhnev and persuade him to be a "man of peace" by accepting it. Gromyko sent the "walk-in-the-woods" proposal to a military-dominated group, which promptly turned it down.

Studies of TNF issues have always included significant uncertainties. Many years ago, RAND was asked about the aggregate probability of error in its TNF studies, and the answer was "at least 40 per cent." This is probably correct. Some decisions were made not on the basis of studies, but because of practical political and bureaucratic constraints. Secretary of Defense McNamara allowed the TNF stockpile to increase because he had so many other battles on his hands, and he was led into inconsistencies that he found almost impossible to resolve. There was no persuasive answer on the utility of employing TNF in actual operations if war broke out or on whether TNF use could be separated from strategic force employment.

However, the TNF were believed to have a deterrent effect, and leaving the TNF programs alone was easier than trying to change them.[1]

Other problems are bureaucratic biases and the reluctance to strive for a minimum level of objectivity. The absence of objectivity leads to "crooked" war games. In games such as Saga, the organizers refused to accept input that differed from their preferences. Analysts and war-gamers should conduct their work with honesty, flexibility, persistence, and common sense.

Leon Sloss offered an example of an exercise in which the organizers were out of touch with policy makers. The scenario for a 1968 exercise called for execution of a large SIOP option. Secretary of Defense Clark Clifford rejected the proposed option because he was not persuaded that the events depicted in the scenario provided sufficient justification for large-scale nuclear use.

"Revisiting the Interplay Among TNF Policy, Studies and Exercises" by Dr. Phillip A. Karber

Phillip Karber provided a retrospective overview of approximately 200 studies and related documents during the period 1950–83. In his judgment, about half of these studies, at most, were important for some reason. In compiling his list, Karber omitted noteworthy exercises, such as Carte Blanche and Project Whiskey, and studies of the weapons and analyses of the threat.

On the basis of NATO Military Committee statements of doctrine, Karber identified three periods: 1950–57 (MC14/1, which became known as "massive retaliation" after U.S. policy statements in 1954); 1957–67 (MC14/2, the "Sword and Shield" policy); and 1967 to the present (MC14/3, known as the "flexible response"strategy).

During the period 1950–57, the U.S. was assumed to enjoy a quantitative and qualitative advantage in nuclear weapons, but (owing in part to the limited numbers of weapons at that time) theater targets were of secondary importance in relation to the Strategic Air Command (SAC) bombers' primary missions. The main role of Tactical Air Command (TAC) fighters was to support SAC bombers, and only a small number (perhaps 100) had nuclear bombardment missions. The SAC offensive was to overlap with a tactical offensive oriented toward victory on the battlefield. The title of the 1954 SACEUR document, "Planning for Nuclear Weapons in Lieu of Operational Reserve," suggests the function that was attributed to TNF. The 1955 SAGEBRUSH exercise involved 250 nuclear rounds, of which 80% had yields greater than 20 kt—large-yield air-dropped weapons aimed at the rear of opposing units. The 1957 KING COLE project studied the possible use of atomic demolition munitions to create barriers and thereby channelize enemy movements on the battlefield.

During the period 1957–67, weapons became available in great numbers on both sides, and the purpose of their use, from NATO's perspective, became one of simply preventing defeat. The inability to acquire mobile targets led to a greater emphasis on fixed targets, whereas ballistic missiles became increasingly important as a means of nuclear weapon delivery. The vulnerability of aircraft to preemption led to Quick Reaction Alert programs. The Kennedy Administration was preoccupied with the concept of control, including the need to exert more effective control over nuclear release mechanisms and the need to control escalation, in the event of nuclear

employment. The preoccupation with control made the concept of direct-fire sub-kiloton Army weapons (the Davy Crockett was a first-generation experiment in this direction) unacceptable, while longer-range missile systems (such as the Mace and Matador) were seen as undesirable because their use could be escalatory.

The 1957–67 period saw reliance on a tripwire concept, with no official doctrine for a major conventional battle before nuclear weapon use. However, exercises were conducted to test concepts of delaying Soviet advances by conventional means before use of nuclear weapons. The SACEUR's 1963 directive regarding forward defense posited a decisive conventional engagement. The 1964 Oregon Trail project showed that the Army's concept for TNF operations would not work: the results implied unacceptable devastation to NATO; rather than saving manpower, TNF use would cause irreplaceable losses. The 1966 Fallex command post exercise raised a key question: If there is to be a decisive conventional engagement, how would NATO's forces make the transition to a "nuclear-scared" posture? The dispersal to such a posture implies the collapse of the conventional defense, i.e., a greater likelihood of conventional defeat.

During the 1967–83 period, although many nuclear weapons remained available, the concept shifted to one of using few of them (after NATO's defeat on the conventional level), in order to avoid escalation and to promote war-termination. NATO's commitment to a robust conventional campaign was strengthened, and the war-termination logic became dominant after 1970. The high loss rates and impressive performance of Soviet conventional technology in the 1973 Middle East war encouraged NATO to take new conventional war technologies more seriously. With the 1975 studies by the Political Implications Team (PIT) and the Military Implications Team (MIT), the question became one of how to disrupt the Soviet concept of conventional operations. The work by the Army Training and Doctrine Command (TRADOC) on integrating ground and air assets for the forward and deep battles followed, resulting in AirLand Battle and the Follow-On Forces Attack (FOFA) concept.

The enduring issues, Karber concluded, are the following:

- target acquisition (especially for mobile and transient targets);
- response time (including the issues of release authority and selective response);
- pre-launch survivability;
- command, control, and communications on the nuclear battlefield (including problems of "positive control" and "real-time" communications in dispersed postures);
- alliance sharing of nuclear responsibilities and assets; vulnerabilities during the transition from a conventional to a nuclear posture;
- doctrinal ambiguities; and
- the "fallacy of the last response."

The U.S. has tended to assume that it enjoys an enduring technological advantage and that the Soviet Union will not act to eliminate that advantage. After the Soviets began large-scale deployments of nuclear artillery in the mid-1970s, no study was done of the implications of the Soviets eliminating the previous NATO advantage in nuclear artillery. The Oregon Trail study was flawed with a similar assumption of

a NATO monopoly in nuclear artillery; on those terms, nuclear artillery appeared to favor the defender, but this is not clear if both sides had such weapons.

"NATO Policy and Force Structure in the Early 1950s"
by Dr. Patrick J. Garrity

Patrick Garrity noted that examining the earliest TNF studies might help establish a benchmark for the project as a whole. Project VISTA, which started in April 1951, should be placed in its historical context—above all, the U.S. interest in the tactical potential of nuclear weapons because of the need for a militarily viable local defense of allies, and the Army's interest (owing in part to interservice rivalry) in technological improvements in nuclear weapons.

Project VISTA included studies on a large range of questions involving the defense of Western Europe, not simply TNF. It assumed that a future conflict in Europe would involve large-scale conventional operations, but that air-delivered TNF in the 1 to 50 kt range could be used for specific purposes, e.g., denying the enemy an ability to concentrate on the battlefield and attacking Soviet airfields, assembly areas, and bridges. To reassure the West European allies and strengthen their determination to resist Soviet aggression, it was recommended that NATO's intention to use militarily effective nuclear weapons for tactical purposes be emphasized in public policy statements.

Project ATTACK, another study in the early 1950s, focused on TNF use issues. Its recommended targeting priorities were comparable to those in Project VISTA—railroad bridges, logistical interdiction, lines of communication, and so forth. Project ATTACK concluded that, without nuclear support, NATO could be defeated; but with nuclear weapons, NATO might be able to conduct a successful defense on or east of the Rhine. Another finding was that, even with nuclear support, NATO would require more conventional forces than it then had, because nuclear weapons could not substitute for troops; indeed, if both sides used nuclear weapons, even more troops would be required.

Assessing the impact of these studies is difficult, but some generalizations may be offered. Timeliness of employment, release authority, and weapons yield were recognized as important issues. The problem of two-sided employment was identified, but it could not be resolved. The probability that nuclear weapons employment would increase manpower requirements was also recognized.

The studies failed to pay adequate attention to political and psychological factors; the potential negative impact of making the assumptions and results of studies about nuclear weapons use known to allied governments and publics was not considered. The June 1955, the Carte Blanche exercise demonstrated that study activities can have an impact on public opinion. Studies were nonetheless sometimes conducted within a closed community, with agencies and officials in effect "answering their own mail." There does not seem to have been a close link between the Supreme Headquarters Allied Powers, Europe (SHAPE) and National Security Council (NSC) studies of the period.

The VISTA study became public because of the Oppenheimer controversy and interservice struggles.[2] As a result, Project VISTA became an example of the type of study that serves to focus and clarify the public debate; others in this category

include the 1946 Acheson-Lilienthal report, the 1983 Scowcroft Commission report, and the 1988 report of the Commission on Integrated Long-Term Strategy.

One of the VISTA recommendations, the establishment of a tactical atomic air force, disturbed the Air Force because of the impression that it could be equivalent in organizational and political standing to the Strategic Air Command. As a result, the Air Force demanded the recall of all copies of the VISTA report. Another controversial aspect of the TNF debate at that time was Oppenheimer's proposal for what some saw as strategic no-first-use, the possibility of nuclear weapon use in Europe without intercontinental nuclear strikes.

"The Pentomic Experience" by Dr. Theodore S. Gold

Theodore Gold discussed the Pentomic division experience of the mid- to late-1950s, when the Army was most serious about integrating TNF in its plans and organizational structure. The context included Eisenhower's "New Look" strategy and intense interservice rivalry for nuclear roles. The Pentomic divisions were to be small, highly mobile, and dual-capable, with a nuclear emphasis. Each Pentomic division included five infantry battle groups, an armor battalion, a cavalry squadron, artillery, and a transportation battalion. The nuclear assets included the 8-inch howitzer and the Honest John missile.

Although the Pentomic divisions were designed to be dual-capable, they were assessed to be unsuitable for either conventional or nuclear combat. Conventional assets had been cut sharply, and the feasibility of the nuclear mission was unclear. The Pentomic divisions were criticized for their lack of organizational flexibility, conventional firepower, target acquisition capabilities, and tactical mobility. Although the Pentomic divisions were supposed to be capable of swift concentrations and dispersal, each division's transportation battalion had only enough equipment to move one of the five infantry battle groups. Moreover, the Pentomic divisions were difficult to control and incompatible with the unit organizations of NATO allies. The training exercises were also inadequate and unrealistic: in the SAGEBRUSH exercise, artillery, supply, and headquarters units were allowed to continue functioning even when they had supposedly been hit. Finally, the Pentomic divisions suffered from a "command gap," in that captains commanded the infantry companies and colonels commanded each of the five battle groups; there were too few battalions for majors and lieutenant colonels to command.

Gold reviewed possible explanations for the failure of the Pentomic division. Perhaps the problems of the nuclear battlefield were too hard to solve. Perhaps the wrong solution was adopted. Perhaps the solution that was adopted was premature, in that suitable target acquisition technologies were not available at that time; the Air Force Joint Surveillance and Target Attack Radar System (JSTARS) and the Army Guardrail airborne communications detector may in the future provide the requisite target acquisition data. Perhaps the concept suffered from weak implementation, but there is little evidence for that. Perhaps the goals were overly ambitious, in that they amounted to having high confidence about prevailing on the battlefield in either an offensive or defensive posture, whether few or many nuclear weapons were used, and regardless of which side used them first. A less ambitious goal might have been to ensure that the introduction of nuclear weapons

would greatly increase the aggressor's uncertainty about his ability to achieve his military objectives, even in a roughly equivalent two-sided exchange.

Gold suggested that three approaches to nuclear battlefield capabilities might be identified. The first—to design fully dual-capable units—was tried in the 1950s and did not work; the conventional and nuclear capabilities were both compromised. The second, to establish separate conventional and nuclear forces, was championed by the Army War College in the 1950s; but it was not adopted, perhaps partly because of the costs it would have entailed. The third, to place a "nuclear appliqué" over the conventional forces, has been the de facto policy and may be the choice for the 1990s as well. Given the likely political obstacles to maintaining nuclear forces in Europe in the future, it may be necessary to return to first principles: Do we want battlefield nuclear weapons for both "retardation" and "war prevention" roles? Does the Army need its own nuclear weapons?

Prof. Catherine Kelleher noted that studies at the Army War College in 1956–57 raised the idea of establishing an autonomous nuclear element in order to facilitate getting into the nuclear-sharing business.

PANEL I: The 1950s

Brig. Gen. Robert C. Richardson III, USAF (Ret.) said that the planning assumptions behind the 1952 Lisbon goals were "soft" in that they may have over-estimated the capabilities of the Soviet Union and its satellites, and in that they did not allow for NATO tactical use of nuclear weapons or for the impact of SAC bombing of the Soviet Union on the course of the war in Europe. NATO elites nonetheless perceived a major gap in military resources that threatened the alliance's security.

SHAPE's mission was to defend Western Europe, not to take Warsaw; and it was argued that this could be done with fewer troops if they were supported by the decisive firepower—the area destructive capability—that was available with nuclear weapons. Reserve requirements were essentially eliminated, because 90% of the fighting was to be done by existing forces, with the nuclear weapons on hand at the beginning of the war. General Richardson illustrated this point with a chart made 30 to 35 years ago. In non-atomic warfare, the chart indicated, one required forces equal to or greater than those of the enemy; whereas in atomic warfare, one required only the minimum necessary to service the firepower. Another chart of that era held that the defender was at an advantage in tactical nuclear warfare, because the aggressor had to concentrate and maneuver, exposing himself to detection and nuclear fire.

Some of the studies supporting the TNF emphasis were ill-founded but nonetheless thought-provoking. One was the "tolerable loss" theory derived from analyses developed by a group at RAND headed by Igor Anzoff, as General Richardson recalled it. According to this theory, large force concentrations were vulnerable to nuclear attack and would more quickly cross the threshold of "tolerable loss"; but fighting in a certain way could enable one to win, even though only 5% of one's forces might be left at the end of the battle. Field Marshal Viscount Montgomery, who was the Deputy SACEUR, said this idea was "balderdash." No army could win with only 5% of its troops surviving, and the concept of operations was unrealistic—as if both sides at Waterloo had machine guns, and no one adopted trench warfare. This view led to a recognition that classic conventional doctrine related to force organization and deployment would have to be changed as necessary for

survivability in a nuclear environment. In short, force posture, which generally had been considered by planners a fixed factor, then became a variable.

NATO's 1957 Capabilities Plan held that NATO forces could conduct an effective defense with TNF if (a) these weapons were available to the troops from the outset and (b) the troops were reorganized, redeployed, and repostured to survive and fight effectively in a nuclear environment. These provisos were never implemented, perhaps because of the many pressures against such a fundamental conceptual change. These pressures include the experiences of leadership elites; the absence of battle-testing; efficiency and economy measures; fixed political commitments; joint, committee, and multiple leadership arrangements; the lack of conceptual research and development; and special interests.

The dilemmas created by trying to be prepared to fight with either conventional or nuclear weapons were clearly recognized by General Lyman Lemnitzer when he served as SACEUR. General Richardson recalled an occasion in 1961 when General Lemnitzer put it something like this: "We are dead if they use nuclear weapons and we are postured to fight with conventional weapons; we are also dead if we are not allowed to use nuclear weapons and we are postured to use them, because then they will use conventional weapons." The dilemmas arise because survival in a nuclear environment requires dispersion, whereas effectiveness in conventional war requires concentration.

John H. Morse recalled the early 1950s as a wilderness of misunderstanding about the implications of using nuclear weapons. General Curtis LeMay seemed to have given no thought to the prospects of fallout when he advocated the large-scale use of nuclear weapons to end the Korean war. The concept of enhanced-radiation weapons (which first appeared in the late 1950s) was so attractive precisely because of the need to make nuclear weapons more controllable. These weapons were judged to be "clean," causing as little fission products and fallout as possible, instead of simply a "bigger bang for the buck."

The objective of Project Whiskey was to work out a target list for the SACEUR, then General Lauris Norstad. All the members of "Group Able" were American, except for one British officer. The target list was to be implemented through SHAPE. General Norstad then got a letter from General Hodes, the Commander of the U.S. Army in Europe, complaining about the lack of Army control and involvement in this process. As a result, General Norstad worked out a different arrangement: SACEUR would inform each of the major subordinate commanders of the nuclear weapons available, and SHAPE would review their plans and allocations. Some variation of this is still the control policy.

Prof. Herbert York said that the Livermore laboratory received weapons requirements through the Atomic Energy Commission. In general, analyses had little to do with the process. The VISTA report was held back, but it was discussed informally by colleagues. As a result, Project VISTA had influence, but not in a direct mechanical way. The laboratories knew what the needs of the services were on the basis of discussions such as York had during his monthly trips to Washington, with General Bernard Schriever, Admiral John Hayward, General James Gavin, General James Doolittle, and others. Informal interactions in the science advisory panels of the services and at conferences were more important in generating ideas than technical analyses.

On the technological side, in order to make the work at Livermore as exciting as it had been at Berkeley (the laboratory had many staff members from Berkeley), the tendency was to focus on extreme challenges and to make the maximally useful contribution—the smallest size and weight, the best possible yield-to-weight ratio, and so forth. The Polaris SLBM warhead had to be rather small, but the goal was a high yield—apparently the Air Force had a similar goal.

Prof. David Alan Rosenberg said that the goal for the Polaris warhead was set by the Killian Committee in 1954-55. Its recommendation was influenced by Navy officers who knew what the Air Force was seeking.

York said that other examples could be given to illustrate the "so much for analysis" point. The range requirement for the Atlas ICBM—5,500 nautical miles—was determined by making it approximately one-fourth the Earth's circumference. The Air Force asked for an accuracy of 1200 feet, but John von Neumann said that 2 to 5 miles would be close enough. Similarly, the German rocket scientists at Peenemünde during World War II apparently sought a payload of one ton because it was a round number, enough accuracy to hit London, and a range equivalent to twice the range of the big Paris siege gun in the previous war.

Prof. Robert Bowie said that the technical side makes the policy process sound orderly. Most of his knowledge of studies has been gained in the last few months during oral history sessions with General Richardson, General Andrew Goodpaster, and others. He was not conscious of such studies during the 1950s; there was simply an assumption that nuclear weapons were available in large numbers and variety, especially after 1955. Influential studies, such as the Killian report, were commissioned by the executive branch and had a considerable impact, but the impact of the studies described by General Richardson was very modest.

President Eisenhower had several incentives to rely on nuclear weapons. As SACEUR, he had learned about the West European reluctance to invest in larger conventional forces. He wanted to cut U.S. defense spending in order to help balance the U.S. budget. He believed that the best way to assure deterrence and prevent war was to make sure the Soviets understood that any war could easily lead to all-out nuclear conflict.

NATO's strategic problem was trying to reconcile two quite different tasks that were often in conflict: to defend against the Soviets and to reassure the allies. The West Europeans insisted on deterrence through U.S. strategic nuclear capabilities because they could not accept any war in Europe, even at the conventional level. War-fighting was a repugnant idea, but war-fighting capabilities were necessary for deterrence. In 1951 four additional U.S. divisions were sent to Europe to provide "linkage" to the United States. Strategic and tactical nuclear weapons were assumed to be linked. On the other hand, even though the U.S. approach became characterized as one of "massive retaliation" after the January 1954 speech by John Foster Dulles at the Council on Foreign Relations, U.S. policy for regional conflicts in fact relied on local defenses supported mainly by U.S. Navy and Air Force capabilities, and not necessarily on nuclear weapons.

Rosenberg asked to what extent a sense of urgency was felt.

York replied that two stimulating events preceded the Korean war: 1) Soviet nuclear explosive test in 1949 and 2) the establishment of the People's Republic of China, which seemed firmly aligned with the Soviet Union in hostility to the West. The University of California at Berkeley's cooperation with Los Alamos led to the establishment of the Livermore laboratory by 1953. Stalin's death was noticed, but by then, the momentum was under way for expansion.

Richardson said that he could not recall any sense of fear, but rather one of eagerness. Every lieutenant was welcome to come in to see General Gruenther with ideas for new initiatives, in contrast with today's "don't-rock-the-boat" attitude.

Bowie said that NSC-68 foresaw 1954 as a "year of maximum danger," and that Eisenhower rejected that in favor of the "long haul" approach. Fear ebbed away after the death of Stalin.

Nitze said that NSC-68 was not meant to express an expectation of a Soviet attack in 1954. The message was that unless certain things were done by the West, the danger would be more acute by 1954.

Rosenberg said that the outbreak of the Korean war moved up the year of danger to the summer of 1952. What was the role of the allies?

Morse said that there was no allied role in "Group Able," except for the British officer, and the Americans could only talk with him about the weather.

Bowie said that the British were active in pressing for greater reliance on nuclear weapons, and Eisenhower was critical of the MacMahon Act's restrictions on communications with allies.

Rosenberg said that Britain's 1952 Global Strategy Plan was leaked to *Fortune* magazine.

Richardson said that he could recall French, British, and Italian participation in the 1950–51 Heidelberg study on nuclear weapons effects under French General André Beaufre.

York said that he went to Aldermaston in 1956–57 and discussed British air-delivered weapons. He also observed the first British H-bomb test.

Sir Frank Cooper said that British-American scientific cooperation was cut off until the revision of the MacMahon Act, although there were a lot of friendly "old-boy" interactions. The U.S. attitude was that Britain would have to demonstrate its nuclear capabilities before the technical dialogue could resume. Sir John Slessor pushed for close relations with the U.S. and kept up the correspondence.

Don Cotter said that the 1958 amendment to the MacMahon Act was more important than the 1954 one.

Ambassador Seymour Weiss said that informal exchanges were often the most effective and important ones. He could recall a meeting called by Bob Murphy in the late 1950s when the State Department was informed that the Thor and Jupiter missiles had been developed, and that their range was such that they were useless unless deployed in Europe; the question then was deploying them to Europe, which required the expenditure of political capital. When President Kennedy entered the Cuban missile crisis, he thought that he had ordered their removal. The Soviets

sought a trade—the removal of Thor and Jupiter in return for the removal of the Soviet missiles in Cuba—and Robert Kennedy agreed.

York said that the technical people knew that Thor and Jupiter would go to Europe.

Morse said that Weiss was one of the few State Department people willing to listen to anything technical.

Weiss said that there was a glitch in the system in that the technical and military people knew about it, but not the State Department.

Bowie said that the regular weekly meetings between the State Department and the Defense Department were stopped by Admiral Radford.

Dr. Robert Pfaltzgraff asked about the origins of the Multilateral Force (MLF) concept of nuclear-sharing.

Bowie said that during the last year or two of the 1950s, General Gallois and other Europeans were raising the question of U.S. reliability and coupling, and it was obvious something had to be done. Norstad proposed a NATO nuclear force consisting of land-based missiles, but he had not thought through the question of control. At a December 1959 meeting, Secretary of State Herter said that a 10-year plan was needed, and Bowie was invited to prepare it, with the help of others.

The purpose of the mixed-manned and joint control arrangements of the MLF was not military, but political—to address the feelings that some allies had about what seemed to be non-participation in the alliance's nuclear policy and thereby prevent them from losing confidence in the alliance. It was also hoped that the MLF might squeeze out tendencies toward the pursuit of national nuclear capabilities and perhaps even bring in the French; the arrangements might eventually be transferred to the European Community. It was judged that the British and French insistence on safety through national nuclear capabilities could undermine the cohesion of the alliance, because it would underscore what could be portrayed as a discriminatory disparity with the Germans. The British said that they trusted the U.S., but the French did not.

Weiss said that the MLF was supported by most of the State Department, but his political-military office was convinced that it would not work, despite its merits. The subject of control was approached gingerly. The notion that the U.S. would give up control was flatly rejected by Rusk and Bundy. President Johnson concluded that Congress would not support it.

Bowie said that the original proposal called for submarines, but this was vetoed by Admiral Rickover.

Prof. Catherine Kelleher asked, in light of the 1955 Carte Blanche exercise, how much the allies knew about U.S. nuclear policy. What was the relationship between such experiences and the December 1956 decision to share dual-capable launchers?

Richardson said that negotiations in 1954–56 led to the 1956 directive.

Bowie said that Eisenhower felt that it was improper for the U.S. to deprive its allies of nuclear weapons information, and he was irritated by the MacMahon Act constraints.

Richardson said that the paperwork was prepared to give the French an equal break with the British regarding access to nuclear information, but President Eisenhower decided at the last minute to defer this decision to the next President.

Nitze said that the French would have been offered the same conditions as the British if they returned to full cooperation with NATO.

Weiss said that this was the case after the 1962 Nassau summit.

Returning to the Thor-Jupiter issue, Nitze said that the Weapons System Evaluation Group concluded that these missiles were highly vulnerable and not survivable; in Italy, someone could have shot at them with a rifle. Nitze advised President Kennedy to withdraw them. Nitze and Rusk explored this option with the Italians and Turks and got nowhere; George Ball also got nowhere with the Turks.

York said that there was a certain idea of matching and catching up with Soviet missiles. Thor and Jupiter were one-stage missiles and seen as interim systems until the U.S. could build ICBMs. There were two systems because of interservice rivalry, even though one would have been enough. We did not know how long it would take to design effective two-stage Atlas and Titan missiles.

"TNF and the Berlin Crisis" by Ms. Kori Schake

Kori Schake said that, while some of the previous discussion conveyed the impression that studies have had little impact, certain studies undertaken during the 1958–62 Berlin crisis had a significant effect on contingency planning for the crisis itself and, more broadly, on TNF strategy. Three examples are particularly noteworthy:

1. Dean Acheson's reports in March and July 1961;
2. Thomas Schelling's report in July 1961; and
3. the Camp David simulations in September 1961 and February 1962.

The Acheson reports maintained that Berlin was only a pretext for Soviet efforts to make political use of the Soviet Union's conventional superiority, in view of the incredibility of U.S. massive retaliation threats. Acheson recommended that the U.S. refuse to negotiate with the Soviets, increase its conventional forces in Germany, and take other military preparedness measures. Carl Kaysen, Abram Chayes, and Arthur Schlesinger expressed concern that Acheson was recommending an excessively military approach to a political problem. President Kennedy decided to compromise. He did not declare a national emergency; but he called for an increase in defense spending, raised the SAC alert rate by 50%, sought more authority to call up reserves, and so forth. These military measures came mainly from the Acheson report recommendations.

Thomas Schelling's July 1961 paper argued that nuclear weapons use should be intended to influence the thinking of the Soviet leadership. To this end, the nuclear weapons employment should be sufficiently limited to avoid drowning the intended message. In other words, the risk of general war should be raised high enough to convince the Soviets to abandon their aggression but it should not be made so imminent that the Soviets would consider it prudent to undertake pre-emptive attacks. Schelling also recommended tight command and control measures to aid in sending messages of restraint. This approach differed from that of the

Eisenhower Administration, in that the concept was not that of war-winning but one of transmitting risk-signals. It was a break with the previous preoccupation with the military utility of destroying specific targets in a general war. The Eisenhower Administration did not believe in the possibility of limited nuclear employment, and instead stressed the threat of general nuclear war for deterrence.

Schelling's concept was criticized as heavily dependent on Soviet perceptions and lacking in clear guidance for U.S. force structure. It was rejected by Paul Nitze and U.S. military leaders, who argued that how the U.S. should reply to the Soviet response was not apparent. In August 1961 Schelling's concept was presented to General Norstad, who emphatically rejected it. However, it highly influenced U.S. policy because it was supported by the NSC, the Administration's "whiz kids," and most civilian officials, except Nitze. The allies saw it as a unilateral U.S. change and were concerned about the idea of TNF employment without the SIOP, but it was the first introduction of "flexible response" principles, and the allies eventually agreed to it.

The Camp David simulations considered a Berlin scenario as a plausible case for a war game. Despite many types of provocation, even the destruction of a U.S. division, not a single participant in the game was willing to advocate the use of nuclear weapons. Some inferred from this experience that it was unrealistic to rely on a strategy of nuclear weapons employment, because no one would be willing to use them in a real contingency. The exercise thus became an argument for increased conventional forces and options, in order to reduce dependence on nuclear weapons.

During the Berlin crisis, Eisenhower agreed that Norstad should be given a third hat, in addition to his roles as SACEUR and commander of U.S. forces in Europe. The tripartite "Live Oak" planning group was created—France, Britain, and the U.S., plus a German connection. Liaison between the Live Oak powers and the rest of the NATO allies (who might be pulled into any conflict) was a difficult question.

Nitze said that dominant considerations in Berlin were NATO's poor geographic position and the fact that at least six months of mobilization would be required for NATO to be ready for a real showdown. But it was more important to us to thwart the Soviet effort in Berlin than it was to the Soviets to break our will.

Prof. Scott Sagan said that the 1961 SIOP, with its fourteen options, including one that called for attacks on all the countries in the Sino-Soviet bloc, also contributed to civilian distrust of the military planning process.

Schake said that, despite the civil-military split in reactions to Schelling's paper, the military behaved like the civilians in the war game simulations.

"The Sword/Shield Strategy of the Early 1960s"
by General Johannes Steinhoff, German Air Force (Ret.)

General Johannes Steinhoff said that when he took over as chief of plans for the Luftwaffe in 1956, the head of the Luftwaffe was General Kammhuber, who believed that its main task was to build up a strong conventional air defense. In exchanges with General Norstad, however, General Kammhuber learned that technology had changed the likely nature of future war, and he became a strong supporter of the strategy of massive retaliation. German participation in the nuclear delivery role was envisaged, and F-104 Starfighters were procured and modified for this purpose, to convince the Soviets not to undertake the risks of aggression. The German understanding was that nuclear retaliation would be undertaken in response to a massive Soviet attack.

News of the Bowie report was published in the fall of 1960, soon after Steinhoff arrived in Washington, D.C. as the German military representative. This report was one of several signs of a change in American strategic thinking toward a greater emphasis on conventional forces, in order to raise the threshold of nuclear weapons employment. Congressman Hollifield, the Chairman of the Joint Committee on Atomic Energy, even said in 1961 that nuclear weapons should "be used as a last resort only if the conventional forces are overrun." In May 1962, General Decker, Chief of Staff of the US Army, spoke of winning a war in Europe with conventional forces alone. The apparent schism among American strategists and the emerging shift in U.S. strategic policy caused confusion in nuclear "have-not" countries such as the Federal Republic of Germany that had just come to a certain acceptance of the earlier approach to nuclear deterrence.

Several incidents over the years illustrated the shift in U.S. strategic policy, particularly with regard to the roles of the Luftwaffe's Starfighters. In 1965, for example, in an exchange between McNamara and German Defense Minister von Hassel, the Americans apparently wanted the aircraft to be fully dual-capable. However, the Germans were reluctant to give the aircraft, which had been modified for the nuclear delivery fighter-bomber role, conventional missions (such as close support) for which it was unsuited, especially in view of the lack of effective air-to-ground conventional weapons.

The NATO Standing Group, the executive agency of the Military Committee, functioned as a closed cabinet. The members—Britain, France, and the United States—were sometimes reluctant to let the non-nuclear allies participate in their decisions. We had to do away with the Standing Group. The nuclear "have-not" countries were dissatisfied, and the Germans led the campaign to eliminate it.[3]

PANEL II: The Berlin Crisis, 1958–62

Ambassador Seymour Weiss said that the Acheson report acknowledged that Berlin was not vital to U.S. interests in traditional terms (for instance, its resources), but maintained that it would become vital if the President declared it so. The President had good reason to declare it vital because it had been a part of the entire NATO edifice, with an implicit U.S. willingness to fight in its defense. To back away from defense of Berlin would accordingly place the entire NATO structure in jeopardy.

The Camp David simulations were very unrealistic—a judgment shared by Ambassador Weiss and Henry Kissinger, both of whom played in the games. The Red team wiped out the Blue team, but annihilation was not a likely Soviet objective, given their goals regarding Berlin.

The impact of studies on policy has been complicated. In the Berlin crisis, the U.S. positions for discussion in the quadripartite group (the U.S., Britain, France, and West Germany) were prepared in advance by an interagency group chaired, at various points, by Assistant Secretary Foy Kohler, Under Secretary Tommy Thompson, and Paul Nitze.

Other NATO allies complained about the quadripartite planning because proposed military actions, including the possible use of nuclear weapons, were included in those plans.

The allies were unwilling to sign on for a large conventional undertaking; their attitude was that nuclear weapons—and not simply tactical ones—should be used after a three-division conventional defense had been proved inadequate. The allies were prepared to concede the possibility of a limited employment of nuclear weapons, but they expected it to be followed by a total nuclear response.

To reassure the allies that the quadripartite planning was in the interest of the whole alliance, Weiss went to Paris to brief Thomas Finletter, the U.S. Ambassador to NATO. Finletter subsequently asked Weiss to brief the other NATO ambassadors. General Norstad was present and sharply criticized the new concepts. Ambassador Weiss later met privately with General Norstad, and they reached a meeting of minds. Within a few days, the quadripartite concepts received official approval by NATO.

In general, throughout the 1960s, the allies were skeptical about the United States' emphasis on conventional forces and asked whether "flexible response" meant that the U.S. was planning for a massive conventional war instead of effective nuclear deterrence. Europe had suffered greatly during two conventional wars earlier in the century and did not want to support a strategy that seemed to imply acceptance of such an outcome. The United States feared that its European allies were not realistically facing up to the consequences of a nuclear engagement and that the Europeans preferred to risk an intercontinental nuclear exchange between the United States and the Soviet Union. Conversely, the Europeans believed that the U.S. preference was for a war limited to Europe.

The NATO policy debate is still unresolved. What to do may not be clear until the alliance is faced with a specific crisis. There are many different types of military actions that the Soviets could take, some of which could hardly be met credibly with a NATO nuclear response, whereas other attacks might well justify a nuclear

response. For this reason, the U.S. and its allies needed a range of measured options instead of simply relying on a massive SIOP response; this range would be more credible than relying on the SIOP.

Weiss noted that he has never heard any senior U.S. official say that, once nuclear weapons were used, efforts at escalation control would certainly work. Nevertheless, it is clearly in the interest of the U.S. and its allies to try to limit damage, to control escalation, and to bring hostilities to an end at the lowest possible level of destruction. But scepticism as to whether nuclear operations are controllable is surely justified.

General Johannes Steinhoff recalled that, generally, the West Germans feared that deterrence would not work. They were unsure how TNF would work and feared a general nuclear war. Paul Nitze spoke to the quadripartite group about nuclear weapons, and the group came up with the idea of demonstrative use; however, if NATO used two weapons, the Soviets might respond with four.

In the February 1962 simulation, Steinhoff pretended to be the Red commander. He found that it was easy for the Soviets to block Western movement to Berlin in various ways, and that all the allied powers were slow to react. The French were the slowest to react during the exercise. As the Red commander, he made the most realistic assumptions possible, in order not to give the West an alibi to use nuclear weapons.

Brig. Gen. Robert C. Richardson III, USAF (Ret.) said the West Europeans were sensitive about the idea of a "pause" and delays in the use of nuclear weapons because they saw these as evidence of the U.S. backing away from commitments to use the weapons. In their view, this backing away would give the nuclear initiative to the Soviets and open the door to a war of attrition.

The Live Oak organization was, Richardson recalled, not initially in the SHAPE compound, but at the nearby U.S. European Command (EUCOM) at Camp de Loges in St. Germain-en-Laye. Live Oak was both an operational organization and a code name for Berlin-related plans, but these plans were not necessarily always passed on to the operational organization. In his experience, use of nuclear weapons was not considered in the Live Oak group; NATO would take over for nuclear operations. Nitze instructed Live Oak to clear all actions with the quadripartite group, but after Norstad sought instructions thirteen or fourteen times and the responses took from 2.5 to 36 hours, Nitze sent Norstad a cable telling him to use his own judgment and inform the quadripartite group afterwards. However, Live Oak did not command any forces; it was a sub-cell of the operations division of SHAPE. When Richardson reported to Norstad, which "hat" Norstad was wearing was not always clear.

General William Y. Smith, USAF, Ret. said that Live Oak commanded no forces in peacetime, but forces were assigned for Berlin contingencies that would go under SACEUR's command.

Sir Frank Cooper said that, from a legal point of view, Berlin had nothing to do with NATO. Berlin was a matter for the four powers, with an obvious German interest. Live Oak was a planning staff. From a British viewpoint, the Berlin crisis was a major game of bluff, in which the Western powers had to assert and uphold their rights.

Walter Slocombe asked to what extent planning was affected by the fact that the West had not forced the corridors in 1948 and whether a repeat of the Berlin airlift was envisaged.

Richardson said that he had no recollection of any criticism of the West's behavior in the 1948–49 crisis. The lesson from the earlier crisis was that the Soviets would back down in the face of firmness.

Schake said that there was a rather extensive debate about a possible repeat of the airlift. The French criticized the idea on the grounds that the city had become harder to sustain and that the aircraft would be vulnerable to Soviet interception.

Nitze said that another airlift would have been impractical on mechanical grounds; it could have been easily interdicted.

Richardson said that the problem would not have been cargo capacity, but maintaining the air corridor access rights.

Smith said that another airlift was a fall-back plan.

Rosenberg said that the Joint Chiefs of Staff (JCS) monitored Berlin's supplies and estimated that the city could hold out a week to ten days.

General Donn Starry, US Army (Ret.) said that the Live Oak instructions were enormously restrictive; for example, Western forces were forbidden to go on the shoulder of the autobahn leading to Berlin. In the event of war, it was intended to attack the Soviet casernes that were close to the autobahn with air-delivered iron bombs. We had no confidence in our ability to use nuclear weapons in a timely fashion, partly because of the proximity of the Soviet casernes to the autobahn.

Rosenberg asked what kind of impact the studies had on NATO planning. In General Maxwell Taylor's papers, there may be found his reaction to a 1959 Schelling paper on nuclear weapons and limited war; his sole comment was: "Too ethereal for me." The "rationale" paper based on National Security Action Memorandum 109 was not presented to the British, French, and German Defense Ministers until after Khrushchev withdrew the December 1961 deadline.

Nitze said that the options paper was first called the "Horse Blanket," on the grounds that a piece of paper that size would be needed to encompass all the possible actions and responses. The abbreviated version, with what were deemed the more serious options, was called a "Pony Blanket." With minor revisions, the latter was approved by President Kennedy in October 1961 as National Security Action Memorandum 109; it was subsequently also called the "Poodle Blanket."[4]

Richardson said that it is harder to get people to read studies and use them than it is to get people to pay for them. In his experience, most studies are initialed and thrown into the 'out' basket.

Weiss said that the United States, in dealing with NATO problems, has often been viewed by its allies, and frequently with justification, as inconsistent. In several cases over the years, the U.S. has leaned on the allies to accept something and then has changed its mind, which has eroded alliance cohesion. An outstanding example is the so-called neutron bomb in 1977–78. Another example is the U.S. insistence in the late 1950s that NATO accept intermediate-range missiles, only to pull them out following the Cuban missile crisis. The United States has essentially repeated the

same action more recently in connection with the INF Treaty. Allied governments expended enormous political capital to accept U.S. missiles, only subsequently to see them removed by a change in U.S. policy.

"The Oregon Trail Study" by Dr. Joachim E. Scholz

Joachim Scholz said that the Oregon Trail study in 1963–64 was an Army-sponsored effort to determine a valid basis for TNF strategy and employment policy. The Oregon Trail concept suggested that each company should have TNF systems that could be used after authorization. Captains and majors would be authorized to use weapons with yields of 2 kt or less. The concept called for great dispersion in order to improve survivability in a nuclear environment, but the units were expected to concentrate for conventional combat.

The Oregon Trail study was critically evaluated by a review board in June 1965. Although concern was rising in some circles about Soviet TNF capabilities, the board discounted the likelihood of conflict with such weapons. The board rejected the proposed tactics; it held that no single force could be prepared for both conventional and nuclear war. Shifting from preparedness for one type of combat situation to preparedness for the other would require major redeployments, and the necessary time would probably not be available. The board also rejected the idea of authorizing junior officers to make nuclear fire decisions; this was unacceptable on both political and command, control, and communications grounds. The board rejected as well the recommendation that the number of main battle tanks be reduced; in the board's view, the existing configuration for conventional combat was more important than the proposed reconfiguration for nuclear combat.

The board found the study unrealistic in various ways. The estimates of likely casualties were too low, as were the estimates of the likely costs of implementing the recommendations. Problems of individual and small-unit motivation and performance in a high-stress situation were neglected. Artifical and implausible assumptions were made (e.g., troops going through a target area soon after a 20 kt explosion, and communications being reestablished in a few minutes after nuclear explosions). The board found the large war games undertaken in Oregon Trail of doubtful validity. Oregon Trail failed to recognize that NATO forces were not really dual-capable and would lack survivability and operational effectiveness in a nuclear environment. Despite its critical analysis of Oregon Trail, the board agreed that Army doctrine and training should be revised.

The Oregon Trail findings never became references in the Army's doctrinal inventory. The study caused alarm in the senior Army staff, not only because it threatened the Army's equipment procurement plans. After the experience with the Pentomic division (1954–59), the Army had just completed (in 1960–63) another restructuring—the Reorganization Objectives Army Division (ROAD). Oregon Trail implied a return to a nuclear-oriented organization, whereas Army leaders considered nuclear war a remote possibility compared to conventional combat. The growing preoccupation with the Vietnam War also diminished top-level Army interest in the Oregon Trail proposals. Therefore, the reorganization suggested by Oregon Trail did not take place.

The nuclear stockpile was not modified as recommended in Oregon Trail—that is, increased numbers of low-yield weapons. Neither was the Oregon Trail concept of low-level nuclear release decisions accepted. Some of the Oregon Trail recommendations about logistical support may have been implemented, and some nuclear options planning may have been influenced by Oregon Trail, but other causative factors were more important. The study was buried and had no direct influence. It was conducted by nuclear experts and reviewed by generalists.

The Oregon Trail study failed to demonstrate the feasibility of organizing forces capable of both conventional and nuclear combat. To this day, it may be argued, Army doctrine remains ambiguous and unsatisfactory regarding the question of organization and tactics for TNF operations. The implicit assumption is that distinctly different types of forces would be required for nuclear and conventional operations.

Theodore Gold said that, as with the Pentomic division, Oregon Trail failed to convince experienced officials that enough conventional capability would be provided by the proposed new organization.

David Alan Rosenberg said that Secretary of Defense McNamara totally rejected the types of recommendations made in Oregon Trail. A declassified 1965 Draft Presidential Memorandum clearly reflects the criticisms of Oregon Trail. What happened at the JCS level is not clear.

Henry Gaffney noted that the device of Draft Presidential Memoranda was used by Secretary of Defense McNamara to make policy statements. This 1965 Draft Presidential Memorandum was prepared by Frank Camm. It argued that war-fighting with nuclear weapons on the battlefield would not be practical, and that the study's conclusions were unrealistic.

"The NATO Follow-On Use Studies" by Mr. Garry S. Brown

Garry S. Brown began by reviewing the background of the follow-on use studies, which were commissioned when the Nuclear Planning Group adopted the Provisional Political Guidelines (PPGs) for the Initial Defensive Tactical Use of Nuclear Weapons in 1969.[5] A wide disparity of views about appropriate follow-on use short of general nuclear war made reaching a consensus hard. The follow-on use studies constituted a process in which NATO governments tried jointly to determine a sound policy.

Each study differed in its assumptions and methodology. None was actually war-gamed; the analysis was essentially static. A number of factors were not taken into account:

- psychological considerations;
- the disruption of command, control, and communications; and
- delays, owing to the time required to replace casualties.

Given equal damage, the numerically superior side obviously remained numerically superior. The analyses of the air combat were simplistic, in that all aircraft and air bases were treated the same. If the Soviets were assumed to shoot back with the same number of weapons, but with weapons of higher yield, NATO was left much worse off than the Warsaw Pact. There was no real military

advantage in using TNF if the Soviets replied in kind. Moreover, effective use of TNF would cause great collateral damage in West Germany and even greater damage in East Germany, especially if the weapons were surface burst.

In short, it was concluded that Soviet response-in-kind could leave NATO worse off than the Warsaw Pact, and that follow-on use was not a viable alternative to building an effective conventional defense. The evidence that follow-on use would work to restore deterrence was not sufficient. However, if follow-on use was undertaken, the purpose would be the same as initial use—to convince the enemy to reassess his objectives, to cease his attack, and to withdraw.[6] Brown called attention to an unclassified statement in the Phase II Study Report in 1975: "To use nuclear weapons is to cross an absolute threshold and introduce into the conflict a profound qualitative change which is accompanied by profound risks to both sides."

The associated studies of new technologies by the Military Implications Team (MIT) and the Political Implications Team (PIT) emerged in 1976 and 1977. These studies considered possibilities such as using precision-guided missiles to deliver low-yield and "tailored effects" nuclear weapons, such as "enhanced radiation" warheads, to achieve a high level of military effectiveness with greatly reduced collateral damage. These possibilities were hard to study realistically and in detail, but the studies concluded that no change in the PPGs was needed and that the threshold between conventional and nuclear weapons should not be blurred. Therefore, the principal purpose of nuclear weapons employment in NATO strategy has remained the political one of restoring deterrence, rather than "war-fighting" on any extensive level.

The studies were designed to maximize allied participation in an ongoing process, and they had a noteworthy impact. The studies gave form to the debate, provided a sense of broader involvement and responsibility, and ultimately led to agreement in 1986 on the General Political Guidelines for NATO employment of nuclear weapons.[7] The studies never seriously contended that large numbers of nuclear weapons were needed or that a nuclear "war-fighting" approach was sensible for a conflict short of general nuclear war.

Henry Gaffney said that the 1969 terms of reference called for an examination of the immediate military effects of packages of options. However, the studies went well beyond the original charter. Secretary of Defense Melvin Laird and his successor, James Schlesinger, seemed to take little interest in them.

PANEL III: From the Founding of the Nuclear Planning Group to the Neutron Bomb Episode, 1967–78

Christopher Makins said that the period 1967–78 began with the founding of the Nuclear Planning Group (NPG) and the adoption of MC14/3, and ended with the first selective employment plan in 1977 and the neutron bomb episode in 1977–78. Five aspects of this period were noteworthy:

1. the great increase in the involvement of the European allies in nuclear policy formulation, notably with respect to the PPGs and the follow-on use and MIT and PIT studies;
2. the evolution of U.S. strategic nuclear targeting, leading to National Security Decision Memorandum (NSDM) 242 in 1974;

3. the promise of new technologies;
4. the growing interest of the Congress and the public in nuclear issues; and
5. the rise of arms control, with MBFR and SALT prominent.

Don Cotter said that, although West European military officials had been dealing with nuclear issues in programs of cooperation with the U.S. since the 1958 revision of the Atomic Energy Act, the founding of the NPG and the discussions regarding MC14/3 led to greater involvement by West European politicians. In the following years, several facts became more widely recognized:

- the Soviet combined arms threat was growing more sophisticated;
- NATO's TNF concepts and inventory were obsolescent, especially in view of the need to limit collateral damage; and
- NATO's TNF posture was highly vulnerable, notably with respect to security against terrorist threats.

The NATO theater employment concepts became selective employment plans.

Sir Frank Cooper said that he was one of the British officials who helped draft the 1969 Healey-Schroeder paper. Owing to the high numbers of fatalities in Europe in the two world wars, the West Europeans wanted to emphasize war-prevention through nuclear deterrence. The basic approach of most West European governments was that the purpose of any initial nuclear weapons employment should be to restore the credibility of deterrence and halt the aggression. The United States may have over-estimated the need to consult with Western Europe in this dimension of policy. At any rate, the U.S. became susceptible to the influence of West Europeans who had been interested in establishing constraints on TNF policy since the 1955 Carte Blanche exercise. The process leading to MC 14/3 and the NPG began after Secretary of Defense McNamara's presentation at the 1962 Athens meeting, when Britain and the United States pledged to exchange information about nuclear planning.

There were two basic camps: the West European view and the U.S. view. The West European view was that planning to win a tactical nuclear war was pointless; that approach was militarily unsound and politically unacceptable. Instead, the emphasis should be on enhancing deterrence and, if necessary, restoring deterrence. The U.S.

view was more employment-oriented. The Americans envisaged the use of hundreds of weapons rather than the very small number favored by the West Europeans.

Britain and the Federal Republic of Germany were invited to pull together the findings of specific study groups. This task was undertaken by small groups involving no more than four people at a time, with access to Denis Healey and Gerhard Schroeder, the British and West German defense ministers. The work was done quickly, about ten times faster than the normal NATO pace. Any initial use of nuclear weapons by NATO was agreed to have the fundamental political purpose of halting the conflict and restoring deterrence, and the entire process was agreed to be kept under close political control. This activity was a watershed in thinking about TNF.

Did anyone in the U.S. envisage such an outcome? At this point, the West Europeans became enthusiastic about the NPG because it offered them influence over their own destiny. Was it a deliberate act of policy by the United States? The NPG changed attitudes toward TNF, and the politicians took over control of the TNF options. Some saw the follow-on studies as a vehicle to enable the military to join the consensus. That the NPG developed as it did is remarkable, because the U.S., either deliberately or unwittingly, surrendered a lot of its previous control over TNF policy.

Leon Sloss recalled that the NPG originated in the MLF experience. The MLF proposal would not be accepted because the United States would not share control over its nuclear weapons and because it would be costly. The NPG was to be the alternative means of providing the West Europeans with a voice. In 1965, a committee was to be formed to enable a few West Europeans to participate in formulating the policies that would guide the development of the nuclear posture. Involving Europeans at the senior policy level in formulating nuclear policy was a significant decision, especially at a time when there was no consensus about the role of TNF within the U.S. establishment, not even within the Army.

The first few meetings of the NPG involved genuine exchanges, specifically among McNamara, Healey, and Schroeder—in contrast to the prepared briefings of later meetings. The U.S. did not entirely anticipate the outcome of the Healey-Schroeder effort; however, it was by design that the most critical study was turned over to Britain and West Germany.

In considering the role of studies, note that it took from 1969 to 1986 to work out the guidelines for follow-on use. There were doubts from the outset about the utility of TNF in a two-sided engagement, particularly in view of the improving TNF capabilities of the Soviet Union. The studies were part of the mediation and negotiation process in seeking a consensus. The United States disliked the idea of "demonstrative" use, so the U.S. chaired the study on that subject, with the intention of seeing that it was rejected. Most of the studies were military and technical, whereas the policy decisions were made on political grounds.

Walter Slocombe said that the TNF experience seems to vindicate the observation of Oliver Wendell Holmes that the life of the law has been "not logic, but experience." The widespread judgment that NATO's TNF policies have been militarily unsound and politically unacceptable does not seem to have made a difference. Western policy has been wildly successful, in that Eastern Europe has been liberated from

Soviet control without a shot being fired. In the meantime, the task of policymakers has been to manage intractable problems, such as the U.S.-West European differences on TNF, in an acceptable way.

There seems to have been little serious thinking about the purposes of TNF. The U.S. Army plans have been terrifying, with extraordinary command and control problems, and large numbers of short-range weapons to be delivered by West European forces. If these issues had been squarely faced, we would have had a series of "neutron bomb" episodes. Too much logic and too much attention to the issues could ruin a good thing, i.e., an effective alliance. By the way, the "neutron bomb" fiasco was not a result of studies of nuclear modernization, but of President Carter's own decisions.

Studies do not seem to have the impact their authors think they should have. At any rate, they are burdened with what is often a spurious objectivity. Keynes wrote that "Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist." In the same way, politicians often seem to repeat mindlessly the conclusions of studies by bureaucrats or consultants of whom they have never heard. Since NATO cannot use TNF to its advantage, the real task has been learning to live with ambiguity.

Henry Gaffney said that as early as 1969, the "hand-in-hand" concept was present—that is, no intensification of nuclear employment on the battlefield without a geographic extension of nuclear employment beyond Germany. Initially this concept had no impact on SACEUR's thinking, but with NSDM 242 General Goodpaster recognized the necessity to act.

Sloss said that SACEUR's staff developed the details of the selective employment plans. Initially these plans were heavily U.S.-influenced, but U.S. influence waned as the British and other Europeans became more involved.

General W. Y. Smith, USAF (Ret.) said that McNamara's attitude when he started the NPG was that if the West Europeans had a better understanding of nuclear weapons, they would be less inclined to want to rely on them. SHAPE nuclear planning was largely under U.S. control at the outset. When General Rogers reduced the staff, nuclear planning was less isolated, and more Europeans were brought into it.

Gaffney said that it was agreed in NATO that the existing conventional forces were adequate for this strategy. After the Soviet invasion of Czechoslovakia, there were even more doubts about Czechoslovak and Polish reliability.

Sloss said that the development of Limited Nuclear Options and Regional Nuclear Options (which became selective employment plans) reflected the need to reinforce extended deterrence. The background included eroding confidence in TNF, owing to the judgment that nuclear weapons use in a theater war would provide no advantages for NATO. Presidential Directive 59 (PD-59) took TNF into account in its assessment of extended deterrence.

Slocombe said that there are two views of how TNF can help to provide for European security. First, TNF can solve the problem of NATO's conventional inadequacy; this is the view of some "neutron bomb" proponents. Second, TNF can provide linkage to the threat of a general nuclear exchange; this was the concept in NSDM 242 and PD-59, and it is the more interesting approach. Massive retaliation was not a credible response to a Soviet attack against Western Europe.

Cotter said that one purpose of the Limited Nuclear Options was to deter limited Soviet nuclear strikes, such as Soviet strikes against U.S. surface ships and reinforcement fleets. All of the NSDM 242 options were to be executed by U.S. intercontinental forces against fixed targets. While General Goodpaster had misgivings about that approach, a counter-air option involving about 20 weapons (developed by General Haig as SACEUR) seemed to really upset the Soviets.

Sloss said that the Wintex series of exercises resulted in policy changes. Over time, the Germans have made efforts to ensure that initial use on allied territory would be effectively excluded from operational consideration.

Cooper said that at the outset, there was a concept of initial use on German soil, but questions were raised as to whether that was advisable.

Gaffney said that nothing in the PPGs indicated that initial use would take place on German soil, but the Germans did make an elliptical statement in 1969: "As regards tactical use of nuclear weapons on NATO territory, the possible need for NATO member countries to make great sacrifices for the defense of freedom is recognized." The selective employment plans were intended to offer rational courses between doing nothing and implementing SACEUR's general strike plan. In 1966, McNamara told General Lemnitzer that he had no plans, only release procedures. At the 1971 Wintex, Helmut Schmidt, who was then the West German Defense Minister, suggested that NATO stop after a limited use, in order to send a signal to the Soviets.

Cotter said that studies and analysis efforts have had results. Secretary of Defense Schlesinger gave responsibilities for certain nuclear studies to the Office of Net Assessment and to the Atomic Energy office in OSD. With this authority, Cotter, who was then the Assistant to the Secretary of Defense for Atomic Energy, and Andrew Marshall, the Director of Net Assessment, turned to the Defense Nuclear Agency and to contractors such as RAND and the Center for Naval Analyses for studies of vulnerability, security, concepts of operations, the synergism of nuclear and conventional force planning to enhance deterrence, and so forth. The nuclear laboratories also contributed to these efforts. The lesson is that setting a deadline and convincing people that there is a customer for their analyses can offer a high chance of success in bringing about improvements in policy.

"NATO's Requirements and Policy for LRTNF" by Dr. Lynn E. Davis

Lynn Davis began by reviewing the origins of the December 1979 two-track decision regarding long-range theater nuclear forces (LRTNF).

An important factor was President Carter's agreement in the spring of 1977 that the SALT II Protocol would ban the testing and deployment of sea-launched cruise missiles (SLCMs) and ground-launched cruise missiles (GLCMs) with ranges exceeding 600 km for three years. From the perspective of West European critics of the Carter Administration, the United States appeared to be denying NATO longer-range SLCMs and GLCMs and accepting parity in strategic nuclear forces, while placing no limits on the superior TNF forces of the Soviet Union, which were then being supplemented by SS-20 missiles. When Helmut Schmidt raised the issue of LRTNF trends, the initial Carter Administration response was to affirm the continued adequacy of existing U.S. strategic and European-based nuclear systems.

This response exacerbated West European anxieties, but the Americans were divided about the potential future utility of cruise missiles. Opponents of cruise missiles in ACDA and the State Department saw these missiles as dangerous and destabilizing.

In the fall of 1977, the High Level Group (HLG) convened, with the U.S. Assistant Secretary of Defense for International Security Affairs in the chair. By early 1978, more quickly than the U.S. had expected, a consensus had formed among the participants in favor of "an evolutionary upward adjustment in the long-range component of NATO's nuclear posture." Further HLG deliberations were postponed while the U.S. National Security Council conducted a study, Presidential Review Memorandum (PRM) 38, regarding LRTNF and arms control. Despite the preference of President Carter and most of his senior advisors for arms control without any new nuclear weapons deployments, the Administration decided to support the West European view in favor of an increase in LRTNF capabilities, partly in order to blunt criticism at home and abroad regarding SALT II and the "neutron bomb" debacle.

In the fall of 1978, the HLG reconvened to consider a U.S. paper discussing potential LRTNF postures ranging from 100 to over 1,000 warheads. The HLG defined criteria for LRTNF modernization, including survivability, widespread alliance participation, and military effectiveness in reaching targets, primarily in the Soviet Union, but also in Eastern Europe. The deployment of 200 to 600 warheads was envisaged, because this would be perceived as sufficiently large to constitute a serious deterrent posture, but not so great as to represent a separate LRTNF balance decoupled from U.S. strategic forces. The new LRTNF missiles were agreed to be land-based in order to demonstrate visibly the U.S. commitment. Martin Marietta had begun to brief U.S. officials in the fall of 1977 about the possibility of building an extended-range Pershing II, and the candidate land-based LRTNF postures consisted of Pershing IIs alone or mixtures of Pershing IIs and GLCMs.

By the spring of 1979, one of the candidate postures consisted of 572 missiles, of which 108 were Pershing IIs and 464 were GLCMs. This option was supported by the JCS and by Zbigniew Brzezinski, the President's national security advisor, and eventually by the President, who was interested in demonstrating strength during the SALT II ratification process. By the summer of 1979, the politicians had taken over, and the analysts went away.

The fundamental issue was the credibility of the U.S. guarantee. It was extraordinarily difficult for the West Europeans to express distrust of the United States openly, yet it was difficult for the U.S. to provide reassurance. The question of credibility was never directly addressed in the HLG. Instead, abstract questions, such as whether parity created gaps in the spectrum of deterrence, were considered before the discussion moved on to hardware. Views on the strategic rationale for the LRTNF differed. Although some in the U.S. military favored the deployment of these weapons so as to create "shock and decisiveness," a catch-phrase for nuclear war-fighting utility, the more typical view was that their purpose was the political one of threatening escalatory strikes against the Soviet homeland.

The Special Group's judgment that arms control should be "a complement to, not a substitute for, LRTNF modernization" meant that responding to the SS-20 was not the sole rationale for the LRTNF deployment. But the possibility of negotiations

leading to no deployments was approved at the request of the Dutch and West German governments, partly because some believed that the Soviets would never agree to negotiate away their SS-20s. For the politicians, the SS-20 became an easier rationale for the LRTNF decision than complicated strategic arguments. Helmut Schmidt hinted that he might change his mind about the importance of visibility and support SLCMs instead of the agreed package, but he was told that the decision process was then so far advanced that shifting to SLCMs would look like weakening the decision.

The role of analysis in making the LRTNF decision was to help in the process of focusing on specific choices; the discussions helped clarify thinking as particular issues were examined. However, analysis left the strategic rationales ambiguous, and the actual decisions were based on political and strategic judgments. In contrast to strategic force analyses, in which specific sets of targets should be put at risk for deterrence, TNF analyses lack specific targeting criteria for stability and force definition.

Don Cotter said that the Pershing II program began in 1974. The rationale for both the Pershing IIs and the GLCMs was to gain greater target coverage through greater range, including an ability to threaten the Soviet combined arms echelons throughout the depth of their deployment, and to achieve a potential for reduced collateral damage through improved accuracy and reduced yield. Both the Pershing IIs and the GLCMs would derive survivability through mobility and more widely dispersed deployments than dual-capable aircraft. An additional rationale was to substitute for the Quick Reaction Alert aircraft and other dual-capable aircraft, which would be more useful in conventional roles. These points were made to the NPG in 1976.

On the political side, Cotter added, to allow the West Europeans to refuse two-key systems was a terrible mistake, because this refusal made the missiles U.S. systems. Therefore, they were more politically vulnerable to Soviet mischief with the anti-nuclear movements in Britain, the Netherlands, and West Germany. This situation led us into strategic regression with the INF Treaty. When the heat was turned up, the European governments stepped away.

Davis replied that her impression was that Martin Marietta championed the idea of the extended range Pershing II during the course of the HLG deliberations as a substitute for the controversial GLCMs. Nor is it correct to say that the European governments stepped away from the decision. The initial deployments took place as scheduled in 1983 in Britain and West Germany. All five of the basing countries rejected two-key arrangements on cost grounds, and the West Germans did not want any control over nuclear systems capable of reaching the Soviet Union.

"The Development of the Follow-on-Force Attack Strategy"
by Dr. Joe Braddock and General Donn Starry, U.S. Army (Ret.)

Joe Braddock said that in the mid-1970s, there was growing recognition of the depth and breadth of Soviet force modernization and of the high-technology opportunities for NATO force modernization. NATO required a more robust conventional forward defense, better capabilities for nuclear escalation with selective employment plans, more capable air defenses, and systems for counter-air operations and attacks against follow-on forces. Selective employment plans had been adopted for attacks against air bases and nuclear weapons capabilities and for the interdiction of lines of communication. But ground forces were viewed as not findable and therefore not targetable.

The nominal Soviet threat consisted of 80 to 105 divisions, of which 21 were in East Germany. Could their locations be determined within the time necessary for a strike cycle? The initial answer was "No." Even if their locations could be determined in a timely fashion, the strikes would have to be cleared with the highest authorities. Beginning in 1979, however, the possibility emerged of finding second-echelon divisions, armies, and fronts, and holding them at risk. This could be done with advanced conventional strike systems, in conjunction with new reconnaissance and surveillance means. The integration of these new technologies and concepts led to AirLand Battle and the Follow-on-Force Attack strategy.

General Donn Starry said that the Soviet threat in Europe had changed by the mid-1970s, owing in part to Soviet technological and conventional force improvements that tried to address the nuclear dilemmas. For the U.S. Army and allied forces, the issue was to fight out-numbered in a conventional battle and win. There was a general conviction that TNF would not be used; the release decision would not come through in time. However, with systems such as the Joint Surveillance and Target Attack Radar System (JSTARS), one could find the targets and reach them with conventional missiles with improved accuracy.

The Israeli experience in the 1973 war had a great impact on NATO's thinking, because the problem was comparable—that of fighting at a forward line while preventing second-echelon forces from overwhelming it with mass and momentum. Although the Soviets, for a time, had asserted that they could pile on more and more ground force echelons in a tactical nuclear war, they subsequently shifted to a conventional-only perspective. Given Soviet conventional superiority and a nuclear stalemate that might deter NATO from engaging in any nuclear strikes, the Soviet offensive might be conducted with conventional forces alone.

The Soviet Union's capabilities and apparent policy made it imperative for NATO to be able to stop the follow-on Soviet echelons before they could overwhelm NATO's defensive lines. In order to regain and retain the initiative, NATO would have to be able to delay, disrupt, and destroy the follow-on forces. This would include attacking Soviet operational maneuver groups (OMGs), logistics and command and control sites, choke points, and lines of communications. Real-time target acquisition would be possible, because OMGs have distinctive signatures. Attacking the follow-on forces this way was one of the key ideas in the 1982 AirLand Battle document.

The forward Soviet troops were to be countered with anti-tank missiles such as TOW, HOT, and Milan. The Soviet reaction to this was to place reactive armor boxes on their tanks. It appears that reactive armor was first discussed in a paper at the Livermore laboratory in 1962, and that the Israelis were the first to act upon the idea. In 1981–82, reactive armor boxes capable of neutralizing anti-tank missiles with shaped charges began to appear on Soviet tanks. Moreover, it now appears that Soviet anti-armor systems—long-rod penetrators—are capable of defeating Western armor.

PANEL IV: From NATO's 1979 Two-Track Decision to the Present

Dr. Robert Pfaltzgraff said that the following developments marked the 1980s:

1. the growing public discussion of nuclear weapons modernization issues, including the intermediate-range nuclear force (INF) debate;
2. the intensifying need, symbolized by the INF two-track decision, to make arms control an important part of the force modernization strategy;
3. the further development of technologies that enhance accuracy and increase problems of survivability;
4. the greater participation of the allies, the Congress, and groups outside the traditional constituencies in nuclear policy debates;
5. the quest for strategies and technologies that would reduce overall reliance on nuclear weapons for deterrence;
6. the prospect of the proliferation of nuclear weapons on a global basis in the 1990s and beyond; and
7. the rapidly changing security environment, including changes with profound implications for existing force structures and doctrines.

TNF choices were determined by political considerations in the 1980s, and the growing importance of the public debate has been apparent in the transition from the INF experience to the discussion on short-range nuclear forces (SNF).

General Donn Starry said that a great challenge of the future is likely to be reaching agreement on the remaining TNF in Europe. Expecting reductions is reasonable, but what TNF should be retained for future contingencies? Moreover, what is to be done about the governments that some call the "seven crazies"—Iran, Iraq, Syria, Libya, North Korea, India, and Pakistan? Some or all of these countries are likely to have ballistic missile capabilities by the turn of the century and nuclear, chemical, and/or biological warheads.

General W. Y. Smith said that there were European-American disagreements regarding the purposes of the GLCMs and the Pershing IIs at SHAPE. The Europeans stressed the idea of relying on nuclear deterrence to substitute for conventional force investments, whereas the Americans tended to emphasize deterrence through a combination of conventional and nuclear operational capabilities. This took place in a period in which arms control negotiations began to influence weapons choices more directly. The SALT II Protocol was seen as narrowing NATO's options. Option III in MBFR included nuclear weapons. U.S.-Soviet negotiations were seen as risky for West European interests.

When the approach that became known as the Follow-on Force Attack (FOFA) concept first emerged in 1976–77, the idea was one of deep interdiction with nuclear forces; it did not attract much attention in the JCS organization at the time. However, the Nuclear Activities Branch of SHAPE under Brigadier General Ed O'Connor began to consider the idea of conducting FOFA strikes with nuclear weapons. In 1979, the Nuclear Activities Branch began examining the possibility of conducting FOFA operations with conventional warheads, and this perceived anomaly led to a reorganization at SHAPE. The allies were not interested in FOFA with conventional weapons until they were persuaded that the necessary weapons could be obtained at an affordable cost.

General O'Connor's branch was also consulted during the two-track decision, even though SHAPE was simply an observer at the HLG. General O'Connor was asked for a target list, and he identified thousands of potential targets, with over a thousand important targets. SHAPE's reaction was that the planned deployment of 572 missiles was a good start. Whether there would be more or fewer would depend on the arms control negotiations. As a British officer, Peter Hardie, put it at the time, determining the number was a political question, not a military one. But SS-20s were not targets, because they were mobile and could not be found for targeting.

Dr. James A. Thomson said that the question of cruise missiles in Europe arose before the Carter Administration. Various offices in the Defense Department, including Atomic Energy, Net Assessment, and Program Analysis and Evaluation, saw merits in effective cruise missiles, whereas the State Department and the Arms Control and Disarmament Agency wished to ban long-range cruise missiles in order to conclude a SALT II treaty. Kissinger's 1976 proposal on cruise missiles was more restrictive than the SALT II Protocol. To the West Europeans, an "evolutionary upward adjustment" in LRTNF meant cruise missiles.

The Carter Administration feared that the West Europeans would not be able to withstand the anti-deployment pressures and would not accept deployments on specific bases. Therefore, once we decided to go down this route, we had to be inflexible. Helmut Schmidt was interested in SLCMs, but if we re-opened the SLCM question, there might be a complete breakdown of the program.

No one disputed that the Soviets had reached strategic parity in the early 1970s. By the mid-1970s, the intelligence on Soviet mechanization, air power, and operational concepts indicated that the conventional force imbalance was serious. Soviet TNF modernization also led NATO to pay more attention to TNF issues.

The idea of using LRTNF to attack second-echelon Soviet forces was present in some U.S. circles, but not in the NATO environment. That idea would imply that the LRTNF were war-fighting instruments. A more important concept—one shared by Americans (such as Harold Brown) and Europeans (such as Michael Quinlan)—was that the Soviet Union was developing a capacity to counter NATO's "flexible response" strategy at all levels and that the trends were especially adverse at the LRTNF missile level, where NATO had none and the Soviets were deploying more and more.

Probability analyses were performed regarding questions such as launching and penetration, and cost analyses were done. The GLCM looked inexpensive, and the Pershing IIs looked costly beyond replacing the 108 Pershing IAs already with U.S. Forces. In retrospect, these analyses look suspiciously inexact, because the GLCM

turned out to be rather expensive. In any case, the LRTNF numbers were based on political judgments, not on military analyses.

Dr. Richard L. Wagner said that an important effort during the 1980s was improving the safety, security, survivability, and control arrangements for TNF. The level of attention to these issues was raised through the establishment of the Senior Level Weapon Protection Group. Even more attention to these arrangements is necessary, to be certain that the risks are diminished. Safety, security, and control arrangements should be more effectively institutionalized.

Studies have a greater chance of making a difference when important issues are in flux. When little change is on the horizon, studies seem to make little difference. Broadly defined weapons design goals such as those of the late 1950s—one megaton of yield and a range equal to a quarter of the earth's circumference—were sufficient because there was a great deal of uncertainty and flux to handle. We are in another period of flux. Do we know how to do the necessary studies to define the scope of potential change? We need to move beyond thinking frozen by a period of 25 years with relatively little change.

Lynn Davis said that one of Richard Perle's arguments in support of the "zero option" for INF missiles was that these systems were not sufficiently survivable. But survivability analyses done in 1978–79 showed that the systems were sufficiently survivable, even if not perfectly survivable. Perhaps new and different analyses influenced his judgment.

The arms control part of the two-track decision was politically necessary, but the original policy was that arms control should be "a complement to, not a substitute for, LRTNF modernization." In the event, an arms control position was adopted that seemed to be inconsistent with the strategic rationale, although it worked in that it got rid of the SS-20s. The problem was that a single type of system was singled out for modernization and arms control without it being set in a strategic context. The cycle of focusing on a single system without talking about strategy seems to be about to recur with the tactical air-to-surface missile (TASM).

Joe Braddock said that it is troubling that the Soviets appear to have a rational framework of analysis and planning regarding their objectives in weapons development and military campaigns, whereas NATO decisions—such as that on LRTNF numbers—are made on political grounds, with no military analysis.

Thomson said that the two coalitions have been very different, with the Soviets dominating the Warsaw Pact and NATO consisting of sovereign democracies. Soviet domination allowed Moscow to impose coherence, and Soviet military planning could be isolated from the political leadership. This is not possible for Western strategic planners. At any rate, the INF deployments did succeed in causing the Soviets great concern and thus contributed to a fundamental reappraisal of the use of military power to gain political ends in the Soviet Union.

Theodore Gold said that the most important role of studies and analysis may be providing officials experience and judgment about the roles and limitations of nuclear weapons.

Sir Frank Cooper said that the United States continually misreads what its allies think. The SS-20 deployments worried and even scared West European governments, at a time when many of these governments were at a low ebb. The

Labour government in Britain was at a low level of defense effort, and the Dutch government was under great pressure, with hundreds of thousands of anti-nuclear protesters. The main British concern was the replacement for Polaris; GLCM was no substitute for it, partly because of uncertainty about whether or not the GLCM guidance system would work.

Davis said that some in the Defense Department were considerably skeptical about the GLCM being as effective as advertised.

Smith said that the GLCM guidance worked well sooner than had been expected.

Garry Brown said that a qualitative change came to the analysis community in 1980–81, in that many people stopped listening. Government officials began to believe what they were saying about the Soviet threat. There was an aversion to nuclear weapons at high levels, and great sums were invested in non-nuclear alternatives. Exaggeration and hyperbole have at times been necessary to sell technology, but it was qualitatively different in that period. The threat was not as great then as we thought at the time, in view of developments in the late 1980s. However, the analytical community increasingly saw itself as advocates and proponents of specific policies and strategies, such as FOFA. But FOFA is still not a feasible concept; the means will not be available for 10 or 20 years.

Smith said that analyses are never as good as they should be ideally. Even after analyses have been performed, many uncertainties remain regarding what would constitute effective policies. Not even the Soviets saw how bad their situation was. We should not set unrealistically high standards for analysis, but simply do the best we can.

Thomson said that when budgets are expanding, analysts with bad news are less welcome. Today, news that a specific program is not so good is more welcome. There was, at any rate, a change in the style of government decision-making at the beginning of the 1980s. From what was intended to be, or at least purported to be, a comprehensive analysis of options, we went to an adversarial court system, with briefs presented for and against specific policies.

Wagner said that a classic example of this tendency may be found in the rationales advanced for the Strategic Defense Initiative. Moreover, the analyses of MX ICBM issues in the 1980s were inferior to those in the late 1970s, when the Secretary of Defense was a technical person interested in technical analyses.

Smith said that plenty of arguments were advanced about the limits of the Strategic Defense Initiative. Was the quality of analysis worse? Or was the quality of analysis that was accepted worse? Some of the better analyses were simply not accepted.

Davis said that some people denied the possibility of doing balanced analyses.

Starry said that the military went from lean years to a cornucopia. Secretary of Defense Weinberger saw his role as one of endorsing the requirements defined by the military. The Defense Guidance was so broad that the military could ask for anything and get it. The military did not need good analysis to obtain funding; there was no premium for it. Simply some analysis was required. The services asked for everything, and Weinberger endorsed everything. This situation led to the funding gap in the Five Year Defense Plan, with the Defense Department $340 billion short

of the requirements specified in the budget. It became incredible to the Congress, and Secretary of Defense Carlucci tried to address it.

Ambassador Seymour Weiss said that although it is probably appropriate that most issues are decided on political grounds, analyses should contribute to a deeper understanding of the issues. The proposal for a "zero option" for INF missiles was based on a political judgment, but it is not clear that there was any analysis of the implications of a Soviet acceptance of the proposal. Richard Perle's view that the survivability of the Pershing IIs and GLCMs was poor may be correct, but the Soviets could use SS-24s and SS-25s and follow-on mobile ICBMs to cover all the targets of the SS-20s; and the Soviets have done so.

Thomson said that analyses in the late 1970s recognized that the concept that eventually became the "zero option" was politically and strategically unsound. For this reason, the Carter Administration tried until late 1979 to uphold the principle that "arms control should be viewed as a ***complement to, not a substitute for,*** force modernization."[8] But concessions that seemed minor at the time led the alliance down the "zero option" road, and the political and strategic rationales became muddled. With the force separations and spatial distances that appear likely to condition strategic planning in Europe in the future, the INF Treaty looks even less favorable to Western security interests today than when it was signed in 1987. One of the lessons is to articulate strategic rationales clearly from the outset.

Wagner said that the European-American tensions regarding extended deterrence are likely to persist because Europe is where the conventional war would be fought, in the event of aggression. This cannot be changed. In the new political conditions in Europe, both aspects of nuclear deterrence will remain important—war-prevention and the operational capabilities that make that possible. But it may be necessary to envisage stationing part of the TNF capabilities in the U.S., even though that would pose the practical and political problem of redeployment in the midst of a crisis when the TNF would be needed. However, after Soviet forces have been withdrawn from Eastern Europe, warning of the movement of the follow-on echelons might be much longer—a year or two instead of a few days. In these circumstances, the NATO response mechanism will not be forces in being as much as laboratories and factories. We need analyses of how technologies and production capabilities can be structured to respond to threats as they arise.

Davis said that not supporting the INF Treaty and reneging on the "zero option" proposal would have led to a loss of public support, which must be retained.

Starry said that establishing a closer relationship between the technologists and the operators is important. Knowing what technology is available from the laboratories is hard for the operational commander. He once discovered that three laboratories were working on the same technology, each ignorant of the efforts of the others. This situation is a serious management problem because the nation cannot afford such duplication of effort.

"The Evolution of Soviet TNF Thinking"
by Major General E.B. Atkeson, U.S. Army (Ret.)

Major General E. B. Atkeson said that Soviet TNF doctrine had passed through six phases.

In the first phase, 1945–53, Stalin's five permanently operating factors dominated public discussion of military affairs. Nuclear weapons were considered important, but not decisive. The Soviets carried forward their nuclear testing and design programs, and long-range aviation was to become the principal delivery means.

The second phase, 1953–55, followed Stalin's death. Malenkov held that a nuclear war would destroy mankind, whereas Khrushchev maintained that Malenkov had failed to understand Marxist theory. In Khrushchev's view, highly capable Soviet military forces could deter the unleashing of nuclear war, but would have to be prepared to fight and win a nuclear war, if necessary.

The third phase, 1955–59, was a period of transition. Efforts to prepare for nuclear war included a preoccupation with Soviet force vulnerability and what the Soviets apparently perceived as a possible need to undertake pre-emptive attacks.

The fourth phase, 1960–64, may be characterized as the nuclear revolution. It began in December 1959, when the Strategic Rocket Forces were established as the primary service of the armed forces, with responsibility for ground-based missiles with ranges greater than 1,000 km (this diminished the relative importance of the nuclear missions of long-range aviation). There was no escalation issue, because it was believed that intercontinental nuclear attacks would precede or occur in conjunction with theater operations. TNF strikes against NATO TNF and other targets would precede conventional operations.

The fifth phase, 1965–80, may be described as that of modern Soviet TNF planning. The Soviets envisaged an initial non-nuclear phase of theater conflict in which NATO might engage in nuclear escalation. But NATO's first use of nuclear weapons would be less important than the Soviet Union's decisive use. Soviet TNF strikes would nonetheless be less extensive than Soviet intercontinental nuclear strikes.

During the sixth phase, 1980–87, the Soviets emphasized non-nuclear planning. The consequences of nuclear weapons use were seen as unpredictable, and entirely non-nuclear operations were deemed more likely to serve Soviet interests. It was argued that Soviet nuclear capabilities could deter nuclear escalation by NATO, and specially designed conventional operations could do much to prevent it.

Robert Bowie said that Khrushchev adopted Malenkov's view—that is, nuclear war is not inevitable, but it would be catastrophic if it took place.

"The Influence of Studies, Analysis and Exercises in Defining TNF Requirements" by Mr. Ronald H. Stivers

Ronald Stivers said that his presentation was based on reviewing war games and related exercises sponsored by the JCS from the mid-1950s to the early 1980s. The war games were interesting and useful when based on sound data and assumptions and when conducted by well-informed, imaginative, and judicious players. More often than not, this was not the case, especially with regard to the data and assumptions.

In the 1950s, there was an attempt to integrate nuclear weapons into battlefield operations plans. The war games and exercises of the early 1960s reflected the prevailing concerns about crises arising over Berlin and Germany. Even conflicts on the periphery would move to Central Europe. Later in the 1960s, attention turned from nuclear to conventional war, particularly as concerns about low-intensity conflict on the periphery increased. This trend continued in the 1970s, especially with respect to the Middle East; conflict seemed more likely to stem from crises there than from incidents in Europe.

U.S. officials were generally reluctant to commit themselves to the use of nuclear weapons. This reluctance seemed to be a function of the magnitude of non-nuclear U.S. capabilities available in the contingency envisaged in the exercise. If any nuclear use was endorsed, it was only limited or "demonstrative" use; the most important question in this regard was the likely collateral damage in terms of population fatalities. No participant embraced the idea of nuclear weapons employment, but it was believed to be almost inevitable in a war in Central Europe.

No contingency plans were made for limited nuclear employment; there was a tendency to design these options on the spot. The participants did not agree about prospects for escalation control and generally were concerned about the possibility that escalation might be inevitable.

Few specific nuclear weapons requirements were derived from the war games, which are perhaps best described as stimulating intellectual exercises. On balance, Stivers concluded, studies and analyses have probably been more useful than war games and exercises.

Leon Sloss said that during the Saga war games of the 1970s, teams would not move into nuclear weapons use unless the scenarios were designed to force them into this type of conflict.

"Concluding Reflections" by Professor Laurence W. Martin

Laurence Martin said that the conference topic was more interesting than might have been expected, because TNF have been at the center of NATO strategy and at the hea[illegible] of the nuclear dilemma, which is how to limit potentially unlimitable power in the service of policy.

The strategy of "massive retaliation" did not look as silly in the 1950s as it looks now. The United States then had a virtual atomic monopoly, and TNF were seen as useful for retarding Soviet offensives in the European theater in conjunction with U.S. intercontinental strikes against the Soviet Union.

When the risk of two-way TNF exchanges was recognized, some method of limitation was needed if TNF were to be linked to policies for deterrence and, if necessary, the conduct of war. The recurrent theme has been to increase conventional forces, and the recurrent counter-arguments have been that conventional forces are too costly and lack deterrent potency and that a conventional war would be catastrophic.

The two potential roles of TNF are denial and conveyance of signals about the possibility of further escalation, in order to convince the aggressor to reassess his plans. Most studies by military organizations have focused on using TNF in the

denial mission. This strategy is consistent with military traditions, but it is a losing strategy for two reasons: 1) the Soviet capacity for conducting this kind of war might be superior to NATO's; and 2) this kind of war would cause unacceptable collateral damage to the allies. However, a little-mentioned aspect of the TNF problem is that we may not have a choice as to whether nuclear "war-fighting" operations will be initiated. If the Soviets used TNF first, we would have to make the best we could of the nuclear battlefield or surrender.

NATO has shifted to the concept of TNF as signaling means to restore deterrence rather than as instruments for the actual conduct of war. But the signals cannot be purely demonstrative. To make the enemy reconsider the risks he is running, the use of nuclear weapons must be militarily meaningful and must help thwart the enemy's strategy. It must make him face the prospect of paying a higher price than he calculated and other difficult decisions. That is, if he took further escalatory steps, we would have to take follow-on action. Critical judgments on this strategy may be unduly harsh. If NATO's goal is not winning the war with TNF, but that of indicating the costs to the aggressor of continuing his offensive, the strategy may be of value for crisis management and the restoration of deterrence. Yet, it is very hard to feel happy about this strategy; we cannot be confident that it would work, and its prognosis for success is not very high.

Are TNF based in Europe essential for this strategy? Could Limited Nuclear Options with U.S. intercontinental forces suffice? In Europe, U.S. TNF have symbolized the American commitment and have enabled the allies, especially the Federal Republic of Germany, to participate in nuclear deterrence responsibilities. However, the Germans are becoming less than enchanted with this role.

The July 1990 NATO concept of nuclear weapons employment as a "last resort" could be interpreted as evidence that the U.S. is diminishing its nuclear commitment, especially in a context in which the United States has decided not to continue with either the follow-on to the Lance missile or the artillery modernization. This is another example of how zero is a bad number, as with the "zero option" and the "double zero." Political formulas have dominated military rationales.

Most studies forget the political question of what the war was about in the first place. The incentives for the Soviets to attack Western Europe have not been very high, especially compared to the risks of attacking. In the NPG context, studies have been valuable in maintaining NATO's cohesion and confidence and in helping to convince the Soviets that the threat of TNF employment has not been negligible.

Although some people anticipate a Kantian utopia of perpetual peace in Europe, the more immediate question is assessing the new Russia. We need to keep our deterrent apparatus in order, even if the threat has apparently disappeared. In other words, we need to be prepared to discourage aggression in case the new Russia becomes threatening, even if the new line of potential aggression may be hundreds of kilometers to the east of the old one.

Some favorable things have recently been written in Moscow about NATO perhaps retaining some TNF in Europe, but the Soviet motives are unclear. Do the Soviets wish to reduce Western inhibitions about other forms of disarmament? Do they expect nuclear weapons to perform a political stabilization function?

The military danger has changed. The time-scale has changed regarding readiness, reinforcement, and other capabilities, but this is not an excuse to run away from our responsibilities. Many Germans say that there is no need for nuclear weapons to be based in Europe—or, at least, in Germany—in peacetime. Nuclear-capable aircraft seem likely to become the new target of heavy political criticism and of the same spirit that did away with other TNF. But the concept of "reconstitution" is not a good basis for TNF planning.[9] It would be better to keep some TNF capabilities ready in Europe for deterrence, thereby making conventional force reconstitution less likely to be necessary.

The Cold War in Europe is over, but the nuclear problem will be with humanity for the rest of time. The Eurocentric experience of NATO TNF may not provide lessons applicable in the wider world. In NATO, the U.S.—the main nuclear power—has been distant from the field of conflict. More important, the United States has been on friendly terms with the West Europeans, the people on the potential battlefield, and interested in their fate and dependent on their cooperation. This highly inhibited atmosphere may not apply in dealings with the governments General Donn Starry called the "crazies." To what extent can the European formula—a stable balance of power—be extrapolated to other regions with very different political and military relationships? Rather than yielding to the temptation to "rent-a-threat," we need to look beyond Iraq and to conduct serious studies of probable future threats and the role of nuclear deterrence in countering them.[10]

Theodore Gold said that in the absence of the well-armed Bolshevik state, nuclear weapons will appear to be more of a problem and less of a solution in the West. To maintain nuclear deterrence capabilities, it will be necessary to retain public confidence and support. This is one of several reasons why more effort should be invested in safety, security, and control measures for nuclear weapons.

ENDNOTES

1. For a similar, more detailed account of this question, see Henry S. Rowen, "The Evolution of Strategic Nuclear Doctrine," in Laurence Martin, ed., *Strategic Thought in the Nuclear Age* (London: Heinemann, 1979), p. 144.
2. A prominent unclassified discussion is David C. Elliott, "Project VISTA and Nuclear Weapons In Europe," *International Security*, Vol. 11 (Summer 1986).
3. The Standing Group was disestablished in 1966, after France's withdrawal from NATO's integrated military structure.
4. This process and the briefings to the European defense ministers are described in more detail in Paul H. Nitze, with Ann M. Smith and Steven L. Rearden, *From Hiroshima to Glasnost: At the Center of Decision* (New York: Grove Weidenfeld, 1989), pp. 203–06.
5. A useful source on the PPGs, the follow-on use studies, and the MIT and PIT reports is J. Michael Legge, *Theater Nuclear Weapons and the NATO Strategy of Flexible Response*, R-2964-FF (Santa Monica, CA: RAND Corporation, April 1983), especially pp. 17–31.
6. As Legge sums up the July 1974 version of the Phase II report: "Follow-on use should have the same purpose as initial use (to persuade the enemy to cease his aggression and withdraw), and the nature of the use should therefore still be selective and be designed to meet this political requirement." Ibid., p. 27. Similar descriptions, particularly with regard to initial use, have been published in several British and West German defense white papers. For example, according to the *White Paper 1975/1976: The Security of the Federal Republic of Germany and the Development of the Federal Armed Forces* (Bonn: Federal Minister of Defense, 1976, pp. 20–21), "The intent is to persuade the attacker to reconsider his intention, to desist in his aggression, and to withdraw."
7. For a published description, see "NATO Drafts Scenarios for Nuclear Response to Aggression," *The Washington Times*, September 25, 1986, p. 8A.
8. See James A. Thomson, "The LRTNF Decision: Evolution of U.S. Theatre Nuclear Policy, 1975–79," *International Affairs*, Vol. 60 (Autumn 1984), p. 609 (emphasis in original).
9. For a discussion sympathetic to a reconstitution approach to nuclear deterrence in Europe, see Karl Kaiser, "From Nuclear Deterrence to Graduated Conflict Control," *Survival*, Vol. 32 (November/December 1990), pp. 483–96.
10. For a more extensive analysis, see Laurence Martin, *The Nuclear Element in European Security* (Newcastle upon Tyne: University Library, and Paris: Institut Français des Relations Internationales for the European Strategy Group, 1990).

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