# WEST EUROPEAN REACTIONS AND RESPONSES TO THE STRATEGIC DEFENSE INITIATIVE

Dissertation submitted to the Jawaharlal Nehru University
in partial fulfilment of the requirements for
the award of the Degree of
**MASTER OF PHILOSOPHY**

**ISHA VERMA**

CENTRE FOR AMERICAN AND WEST EUROPEAN STUDIES
SCHOOL OF INTERNATIONAL STUDIES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI—110067.
1988

# C O N T E N T S

## PREFACE

President Reagan's announcement in March 1983 of the Strategic Defence Initiative placed a new and important issue on the agenda of the United States' relations with its European allies. Though SDI is a research programme designed to explore feasibility of ballistic missile defence systems that will not be available until the 1990s at the earliest, it has raised concerns among the European allies that those systems will increase, rather than decrease, the likelihood of war.

SDI has become a major public issue in European political debates. Several important opposition parties in Western Europe have criticised SDI. The responses in West Europe to SDI have been different from the United States. While the debate in U.S. has focussed on technological feasibility and strategic implications, in Europe, the immediate question of technological feasibility has been evaded and long term questions regarding strategic implications have been deferred. In general, European concerns are focussed on the credibility of American nuclear guarantee; technological challenges facing Europe; vulnerability of East-West relations; and American unilateralism.

The focus of the present study would be, reactions and responses of the West Europeans to American SDI programme.

The European reactions would be examined at two levels : negative and positive. The responses too would be examined at two levels: (a) supportive participation in SDI;(b) towards a parallel SDI.

The first chapter is an introductory one providing a brief description of each technology used in the SDI programme. An attempt is also made to trace the ABM debate during the 1960s and 1970s and how it is linked to the SDI programme.

The second chapter deals with the strategic and political implications of SDI for Europe. Essentially, the strategic questions that bothered the Europeans are related to extended deterrence, arms control and East-West relations. An effort has been made to examine the nature of European fears about the credibility of extended deterrence. History of nuclear armaments points out that new developments pursued by one side are soon matched by the other. The expressed European fear is that both the U.S. and the USSR will become sancturies in war, while Europe would remain vulnerable to both nuclear and conventional devastation.

The nature of supportive participation of Europeans in the SDI programme has been dealt in the third chapter. In March 1985, the U.S. Defence Secretary sent a letter to European nations inviting them to participate in the SDI research programme. The European Allies were not sure of

the eventual goal of such a project and the nature of participation. However, the U.S. by extending the technological carrot to Europe (in a situation when the Europeans realised that they were loosing out in the technological race vis-a-vis the U.S. and Japan) was able to stifle the political and strategic doubts that the Europeans had and obtained a positive support for the project itself.

The fourth chapter has been titled,"Towards a parallel SDI programme: Eureka". In an attempt to meet the SDI programme's technological challenge, the French government proposed a cooperative project called Eureka, on 18 April 1985. The aim of Eureka was to coordinate research and development efforts in the areas of : (1) robotics; (2) information processing; (3) telecommunications; (4) new materials; and (5) biotechnology - at the European level. The French minister Roland Dumas said, "Eureka project is primarily civilian in spirit". However, a closer study of this programme suggests that Eureka programme has military implications also. Indeed it has been observed: "SDI is a military programme which might have civilian implications but Eureka is basically a civilian programme which might have military implications."

In writing this work, I have mainly relied on secondary sources. During the period of my research, I felt that there was a lot of material on SDI as such but the material on the European perceptions of the programme was inadequate.

Regarding the treatment of the subject-matter, I have tried my best to be objective, but how far have I succeeded in my efforts, is left to the fair judgement of the readers.

I wish to express my sincere gratitude to my guide, Dr. Christopher Sam Raj, Associate Professor, American and West European Centre, School of International Studies, Jawaharlal Nehru University, who not only inspired me to undertake the present study, but also gave constant encouragement for the completion of the same. Without his able guidance and ungrudging supervision it would not have been possible for me to complete this work. I will be failing in my duty if I do not mention the help and encouragement received from Prof. H.S. Chopra, Head, West European Division, School of International Studies, J.N.U., Prof. R.P. Kaushik, Chairman, American and West European Centre, School of International Studies, J.N.U. and my friends and colleagues. I wish to thank my family members who created the right kind of environment, so that I could finish my work.

I wish to place on record the help and cooperation extended by the staff of Jawaharlal Nehru University Library, American Centre, Institute for Defence Studies and Analyses Library. Last, but not the least, I must thank Mr. Raju, for typing my dissertation neatly and promptly.

Isha Verma

ISHA VERMA
WEST EUROPEAN DIVISION,
SCHOOL OF INTERNATIONAL STUDIES
J.N.U.

20th May 1988

# CHAPTER I

## INTRODUCTION

The Strategic Defence Initiative (SDI) is a research programme designed to investigate the technological feasibility, of developing a system to defend the United States and its allies against ballistic missiles.

SDI was born on 23 March 1983, when President Ronald Reagan made a televised address to the nation, in which he called upon the scientists, who "gave the nuclear weapons" to now give "the means of rendering these weapons impotent and obsolete". He announced that he was initiating a "comprehensive and intensive effort to define a long-term research and development programme" to begin to achieve the "ultimate goal of eliminating the threat posed by strategic nuclear missiles". The President did not say that the system he was hypothesizing would have space-based components, but he did not rule them out also. He simply said that he wanted to look at the various possibilities of defending against a strategic nuclear missile attack. The term "Star Wars" was coined by reporters, after being briefed by Administration advisers who said that all basing modes would be studied, including (but not limited) to space.

Although, the President said that he wanted to render nuclear weapons "impotent and obsolete" and that he wanted

"to eliminate the threat posed by strategic nuclear missiles" he omitted tactical and theater nuclear missiles, cruise missiles and other methods of nuclear weapon delivery (such as bombers) which are there in Europe. This has led many in Europe to question, how SDI would result in development of a system to render nuclear weapons impotent and obsolete, since strategic missiles are only one method of delivering nuclear weapons.

Following the speech, President Reagan commissioned two studies (the so-called Fletcher and Hoffman studies) to examine the feasibility of the goal of eliminating the threat posed by strategic nuclear missiles and also make recommendations on how to proceed. Among their conclusions, the studies found that new technologies that were becoming available, might provide options to defend against ballistic missiles, and that pursuit of those technologies could enhance deterrence and increase strategic stability.

These reports led the Administration, in January 1984, to establish a research programme known as the Strategic Defence Initiative (SDI) under SDI Organisation (SDIO). In March 1984, Lieutenant General A. Abrahamson was named Director of SDIO and given responsibility for focussing and coordinating SDI programme activities.

The SDI is organised into five research programme elements. A brief description of each programme element follows :

**Surveillance, Acquisition, Tracking and Kill Assessment (SATKA) :**

The objective of this programme element is to investigate sensing technologies that can provide information to activate the defensive system, manage the battle, and assess the status of forces before and during a defence engagement. Space, air and ground-based technologies are being explored to support these functions.

The most challenging task for SATKA appears to be developing the capability to discriminate among enemy warheads, decoys and chaff during the mid-course and early terminal phases of their trajectories. The number of objects requiring at least identification could be in tens of thousands during a full-scale nuclear attack. Without the capability to identify warheads, an SDI derived system would be at a minimum, need to be more powerful & extensive, which could be prohibitively expensive.

Passive, active and inter-active techniques are being considered for target discrimination. Passive techniques involve detecting radiation (e.g. light or heat)

that emanates from the target. Active techniques (e.g. using lasers or radar) involve analysing return signals from radiation sent to the target. And, interactive techniques involve directing radiation or material at the offensive threat to strip away essentially all but the shielded, heavy warheads.

**Directed Energy Weapons (DEW) Technology**

This programme element is designed to explore the potential for using lasers and particle beams for ballistic missile defence. Directed energy weapons can deliver their destructive energy to targets at or near the speed of light, making them especially attractive candidates for use against missiles as they rise through the atmosphere - the boost and post-boost phases of ascent. Successful engagement of missiles in these initial phases could allow the defence to destroy missiles before they release multiple warheads on their own independent trajectories. The capability for achieving such a defensive advantage is key to the SDI concept.

Beam weapon concept, now being studied, include space-based lasers, ground-based lasers using orbiting relay mirrors, space-based neutral particle beams, and endo-atmospheric (within atmosphere) charged particle beams

guided by low power lasers. In addition to research on beam generation technologies, advancements are also sought in beam control optics, fire control, and acquisition, pointing and tracking technologies.[1]

**Kinetic Energy Weapons (KEW) Technology**

This programme element involves research on some of the most mature technologies under investigation by the SDIO. Kinetic energy weapons destroy their targets by impact rather than by explosion. The goal of this programme is to study ways to accurately direct relatively light objects at very high velocities to intercept ballistic missiles or their warheads during any phase of their trajectories. Various means of propulsion are being considered for achieving the velocities required for this task.

Ground launched kinetic energy kill vehicles (GKVs) for endo and exo-atmospheric interception of nuclear warheads are perhaps the most advanced of the KEW technologies. Other KEW technologies under investigation include space-based chemically-launched projectiles equipped with homing devices (so-called "smart rocks") and space-based electromagnetic railguns.[2]

---

1. U.S. Department of Defense, Strategic Defense Initiative Organisation: Report to Congress on the Strategic Defense Initiative (Washington, D.C. 1985), p.24.
2. Ibid., p. 51-59

System Concepts/Battle Management (SC/BM)

Studies performed under this programme element investigate options for defensive architectures that, according to SDIO, are designed to allow for eventual deployment of a "highly responsive, ultra-reliable, survivable, endurable, and cost-effective battle management/command, control and communication ($C^3$) system."[3] Factors to consider in designing alternative system concepts include: mission objectives, analyses of offensive threats, technical capability, risk and cost.

An operational system will require sophisticated automation at a level beyond current computer capabilities to: (1) identify and track all targets from launch until they are destroyed; (2) command, coordinate all elements of the defensive system; and (3) allow for human control, both prior to and during its engagement. Larger the software programme, greater the probability of debilitating errors. The degree of centralization required for such a system is a key issue in this programme. Relatively small, independent software programmes for distinct BMD components could lead to a more fault-tolerant overall system. Examples of computer hardware and software advances sought under SC/BM include very high speed processing, artificial

---

3. Ibid., p.25.

intelligence, computer written code, and self test and correction techniques.

A facility called the National Test Bed is planned for simulating and evaluating alternative architecture and battle management concepts. Should the United States decide to develop and deploy an SDI-derived defence, the National Test Bed could be modified to allow for test and evaluation of actual system components.

**Survivability, Lethality and Key Technologies (SLKT)**

This programme element provides supporting research and technology development to improve system effectiveness and to satisfy system logistical requirements. The survivability and lethality study efforts are designed to yield information about the nature of the expected enemy threat, as well as about the ability of an SDI-derived system to survive efforts to destroy or defeat it. Results of these studies drive component and system requirements.

Work on supporting technologies include, for example, research in space transportation, space power, on-orbit maintenance and energy storage and conversion. SDI logistical research, especially concerning the space-based assets of eventual system, is particularly important for assessing

and reducing deployment and operation costs.[4]

A key issue for the SDI is "how will we know whether it is a success?" The Reagan Administration has proposed two criteria for evaluating ballistic missile defence technologies and concepts that might be derived from the SDI. As enumerated by the then Special Advisor to the President, Paul H. Nitze, these criteria are that a defensive system must be : (1) survivable, and (2) cost effective at the margin.[5] Of course, an additional inherent criteria would be that the system be effective in performing its intended function. The Reagan Administration contends that a system that meets its two criteria would, if deployed, promote strategic stability between the nuclear super powers.

**Proposed Function and Performance of SDI**

The aim of SDI is not to fight a nuclear war; it is to maximize deterrence, with less emphasis on the threat of retaliation. However, SDI does not imply a complete abandonment of a second-strike retaliatory nuclear capacity. President Reagan while describing SDI as a safeguard against "the madmen of the future, has made it clear that some degree of military modernization may be necessary, in the

---

4. Ibid., pp. 25, 67-74.

5. Paul N. Nitze, "On the Road to a More Stable Peace" US Department of State Bulletin, (Washington D.C.) 20 February 1985.

absence of arms reductions".[6] "The ultimate goal of the SDI", US Secretary of Defence, Casper Weinberger confirmed, "is to develop thoroughly reliable defences. This does not, however, preclude any intermediate deployment that could provide, among other things, defence of the offensive deterrent forces. These, ofcourse, we will have to maintain".[7]

SDI is an attempt to discover whether it is technically possible to devise a defence against nuclear ballistic missiles system thereby reducing total dependence on nuclear retaliation to deter a potential aggressor. The potential aggressor would have no way of knowing, which nine out of each ten missiles launched, would fail to reach their targets. His options would thus be limited and his expectations of a successful nuclear strike correspondingly diminished.

The trajectory of a ballistic missile or an ICBM is basically divided into four phases. The SDI research effort is concentrating on the "layered" defence - a system designed to destroy enemy missiles at various stages in their trajectory. In the boost phase (which for an ICBM lasts for three minutes), the missile is lifted out of

---

6. Financial Times (London), 8 March 1985.

7. Address to the National Press Club, Washington, D.C., New York Times, 2 May 1984.

its silo and carried through and out of the atmosphere by its first, second and third stage booster rockets. Each rocket burns for a minute, propelling the vehicle at increasing speed to an altitude of about 200 kms. By the end of this phase, the missile is travelling at roughly seven kms. per second. The vehicle enters the post-boost phase, which lasts for about seven minutes. At this stage, it discharges upto ten multiple independently targeted re-entry vehicles (MIRVs) in a programmed sequence, each on its separate trajectory. The post-boost vehicles may also deploy a number of decoys and other penetration aids with each MIRV.

The MIRVs and decoys then enter the mid-course phase (entirely ballistic-like shells fired from a gun) rising to their highest point at roughly 1,000 kms., before falling back to the earth. This phase lasts for about 20 minutes and leads to the terminal phase, when the MIRVs and decoys re-enter the earth's atmosphere. About two minutes after re-entry, the warheads by this time, are glowing red from the atmospheric friction and detonate over their targets.

The technology for intercepting missiles in mid-course or warheads in the terminal phase relies upon defence techniques like ground based or air-launched systems. The crucial problem is that the missiles carrying ten warheads

each should be destroyed at the beginning of their flight trajectory, that is, before the warheads are separated. However, to destroy a missile deep in enemy territory within seconds of its launch is the most difficult task.

There are a number of techniques. Firstly, a laser beam travelling at the speed of light that has virtually zero time to target, burns through the metal skin of the missile, causing it to disintegrate. Another technique is to use a neutron particle beam - a stream of hydrogen atoms travelling at 60,000 miles per second. These atoms pass through the skin of the missile and disrupt its computerized guidance system. The tracking and accuracy problem encountered in all technologies are apprehensive but not invincible.

The principle problem is that lasers and neutral particle beams need line of sight basing. The generator of beams need an obstructed, direct field of fire at all enemy missile launchers. An effective boost phase defence, therefore, needs a fleet of satellites in orbit. Ideally, this fleet should be large enough to ensure that enough satellites are over the 22 missile fields at any one time to attack all 1,400 Soviet land-based ICBMs, if they are launched simultaneously.

A layered ballistic missile defence system has to perform certain essential functions in each phase, as

spelt out by Dr. James G. Fletcher in 1984 :

1. It has to carry out the immensely complicated task of maintaining a constant watch over the entire enemy force (surveillance).

2. It has to react immediately to the launch of an offensive missile, instantly computing its trajectory and probable target (acquisition).

3. It must distinguish in the post-boost phase between a warhead and a decoy (discrimination).

4. It must monitor the exact trajectory of the missile and its warheads at every second of their flight (point and tracking).

5. It must direct one of a number of defensive weapons to destroy the missile or its MIRVs (interception and destruction).

6. Every one of these activities, requiring high speed data processing and advanced information technology, must be coordinated with an infallible accuracy (battle-management).[8]

One possible example of this would be with satellites in geosynchronous orbit at approximately 36,000 kms., height, to carry out their surveillance role with infrared sensors. These are capable of detecting an ICBM, within seconds of its launch with the help of computers programmed to calculate the general target areas. This information would

---

8. J.C. Fletcher, "Technologies for Strategic Defence", Issues in Science and Technology, Fall, 1984, cited in Current News (Washington D.C.), June 23rd, 1987.

then be communicated instantly to weapon platforms on as many as 100 satellites on a lower orbit at about 200 kms., and simultaneously to a fleet of mid-course satellites, in orbits ranging from 5,000 to 25,000 kms. These sensors would monitor the deployment of MIRVs and decoys by any missiles that survived the first boost-phase defence layer.

The boost-phase weapon platforms would carry hyper-velocity guns, using electromagnetic energy to fire high speed projectiles on a collision course with the missiles. The kinetic energy released on impact would destroy the missile before it could complete its ascent. Once the three stages of the booster rockets on any surviving missiles have burnt out, they can no longer be detected by the high orbiting infrared sensors. Instead, the heat source of the boost-phase would be detected by the mid-course sensors, and the missiles would once again be attacked by the hyper-velocity guns on the boost-phase weapon platforms.

The mid-course sensors now begin to employ an increasing range of devices to discriminate between MIRVs and decoys, including radars, optical and infrared sensors. Once the warheads have been identified, signals transmitted from the space-based sensors will guide thousands of small ground-based rockets into the path of the MIRVs. As they approach the re-entry vehicles, these rockets release their

own warheads which home onto their targets and destroy them on impact.

Finally, information from the mid-course sensors is passed on to infrared sensors, which have been launched on warning of attack. These work in conjunction with radars on the ground, to detect any warheads that might have escaped the earlier defensive layers. When the final trajectory has been precisely computed, terminal interceptors are launched. Since it is necessary to intercept the warheads while they are still high in the atmosphere, in order to minimize the ground effect of any nuclear explosion, interceptors would be high acceleration rockets with on-board guidance systems. As soon as the rockets are within the striking distance of their targets, they would explode clouds of metal pellets in the paths of the descending warheads, or guide 'smart mini missiles' on collision courses, destroying the warheads by kinetic energy.

Throughout this engagement, a battle management system would operate. It would consist of a network of very fast, high capacity computers, based both in space and on the ground. Each defensive layer would also have its own battle management system. This would direct the engagement within its own layer, and remain in contact with the systems of other layers to which it could pass the results of its own intercepts and the details of survi-

ving missiles. The overall command, control and communication system would provide the link between all components of the layers.[9]

This is only one of the models of a positive strategic defence system. However, the programme offers according to the U.S. Administration: (1) A possibility of substantial reductions in nuclear arms race, without the accompanying dangers of instability; (2) A decreased dependence upon the threat of suicidal retaliation as the only deterrent against aggression; (3) A reduction in the chances of a successful conventional attack on Western Europe by extension of Soviet Union's contemplation of such an attack.[10]

**Early Debate Over Anti-Ballistic Missiles: 1960s to 1972**

The intense debates over the deployment of anti-ballistic missiles (ABMs) began in the early 1960s when both the United States and the Soviet Union were developing weapons with a limited capacity to intercept Inter-continental Ballistic Missiles (ICBMs).

---

9. Lord Chalfont, "SDI in Context", U.S. Naval Institute Proceedings (Annapolis, Maryland), April 1986, p. 70.

10. W.B. Weinrod, (ed.), Assessing Strategic Defence, Six Roundtable Discussions (Washington D.C.: Heritage Foundation, 1985).

The United States and the Soviet Union designed the earliest ABM systems to protect population centres. The United States could have deployed its Nike-Zeus anti-ballistic missile system by 1964 and its successor the Nike-X system by 1968. However, Soviet advances in developing Chaff and sophisticated decoys as components of their ICBM systems would have severely limited the effectiveness of both Nike-Zeus and Nike-X. Consequently, President Johnson scrapped plans to install them. Between 1966 and 1968 the Soviets deployed their own ABM system -- the Galosh -- around Moscow. The consensus among US Department of Defence officials was that the Galosh system had only a minimal capacity to intercept and destroy offensive missiles.[11]

Both Soviet and US officials acknowledged that their earliest ABM systems would have limited effectiveness against a massive attack, and contended that such systems were designed to protect their populations against attack from a second-ranking nuclear power such as the People's Republic of China or against an accidental missile launch by another adversary. In 1967, the then Secretary of Defence, Robert S. McNamara announced plan to install the

---

11. Jeremy J. Stone, The Case Against Missile Defenses (Adelphi Papers, International Institute for Strategic Studies, London, April 1968) pp. 1-2.

the "Sentinel" ABM system for such purposes, though he stated that even for such limited aims Sentinel's effectiveness was "marginal".[12]

US officials continuously expressed, only limited confidence in these early ABM systems. Throughout the 1960s and early 1970s most policy-makers and strategic analysts stressed that the capacity of new offensive missile systems to penetrate an ABM defence was outstripping the progress of the technology designed to blunt an ICBM attack. The United States held an early lead in developing these offensive systems. By 1968 the United States had begun to develop the Multiple Independently Targetable Re-Entry Vehicles (MIRVs). Offensive missiles with multiple warheads, mixed with decoys and chaff, greatly complicated the effort to design a ballistic missile defence system able to prevent ICBMs from reaching their targets. Because the Soviets had deployed the Galosh ABM system around Moscow, Secretary of Defence McNamara in March 1967 stated that, "I do not think there is a senior civilian or military official in the Defense Department that does not believe that we should react to the Soviet ABM deployment by expanding our offensive forces...."[13] Jeremy Stone, a leading strategic analyst,

---

12. Paul E. Gallis, The Strategic Defense Initiative and United States Alliance Strategy (Congressional Research Service, The Library of Congress, Washington D.C., 1985), pp. 3-4.

13. Cited in Stone, n. 11, p. 5.

summarised the argument for countering existing ABM systems in 1968 when he wrote :

> The offense can try any one of many methods; the defense must protect against each. The offense can lose many times and still succeed in its goal of destruction....[14]

In 1969, President Nixon stopped the deployment of the Sentinel system and decided to concentrate on developing the more sophisticated SAFEGUARD system. Theoretically, SAFEGUARD, a system utilising the nuclear-tipped SPRINT and SPARTAN missiles, had a limited capacity to intercept an attack by the People's Republic of China or to restrict the damage of Soviet first strike against hardened MINUTEMAN missile sites. Construction of a SAFEGUARD site began at the Grand Forks, North Dakota, a missile base in 1970. The SAFEGUARD site at Grand Forks marked a move towards and intended use of ABM systems to protect US offensive missile systems against the possibility of a first strike by the Soviet Union.[15]

**SALT I and ABM System**

The recognition that ballistic missile defence system might serve as a continued spur to the race in

---

14. Ibid., p.6.

15. Abraham and Jerome B. Wiesner, ABM: An Evaluation of the Decision to Deploy an Anti-Ballistic Missile System (New York: Harper and Row, 1969), p.255.

developing offensive delivery systems was an important factor in efforts by the United States and the Soviet Union to seek restriction on the deployment of ABMs. In 1966, the United States had proposed, with no result, a freeze on the further deployment of offensive and defensive nuclear missile systems. In 1970, the Soviet Union and the United States began the Strategic Arms Limitation Talks (SALT) negotiations. The purpose of SALT was to restrict the development of more highly accurate offensive delivery systems, of MIRVs and of ABM systems.

Advocates of SALT contended that MIRVs, when combined with increasingly accurate guidance technology, might provide an attacking nation with a capability to destroy much of an opponent's retaliatory system. If the attacking nation also possessed an ABM system that could provide a shield against the remanants of its opponent's retaliatory forces, then that attacker might view its combined offensive and defensive systems, as making first strike "a reasonable proposition" in the words of one strategic analyst.[16]

**West European Attitudes Towards ABM and SALT**

With few reservations, the NATO allies in Western Europe supported efforts by the United States and the Soviet

---

16. Michael Howard, "Arms Control and Disarmament", NATO's Fifteen Nations (Netherlands) December 1970-January 1971, p.44.

Union to reach an agreement that would restrict the development of both offensive and defensive missile systems. In 1970 and 1971 some European leaders expressed a fear that SALT might allow the Soviet Union and the United States to deploy effective ABM systems behind which the two countries would retreat; such ABM systems, these critics argued, might tempt the two superpowers to leave Europe as their proxy battlefield. They feared that the continent might become an unshielded fighting ground for settling disputes with Europeans bearing the cost.[17]

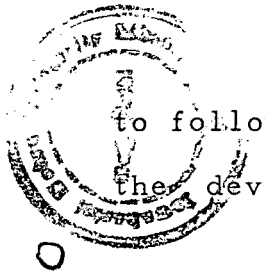
Yet the governments of the European NATO States ultimately endorsed the SALT negotiations as a means to control the arms race and maintain the nuclear balance. In the late 1960s and 1970s, there was little evidence of apprehension in Western Europe over an imminent Soviet threat.[18] There were a few proponents of the necessity for US strategic superiority in the allied governments. West Europeans also expressed reservations over the potential

---

17., Michel Debre, "France's Global Strategy", Foreign Affairs, (New York), April 1971, p. 403. (In 1971, Debre was France's Defence Minister); Andrew Pierre, "Nuclear Diplomacy: Britain, France and America", Foreign Affairs, January 1971, p. 286.

18. Paul E. Gallis, n. 12, p.7.

high costs of developing ABM systems to cover their territory. Such costs were particularly on the minds of the leaders of Great Britain and France, already expending large sums in developing their own offensive nuclear missile forces.[19]





Under President Charles de Gaulle, France decided to follow a path meant to guarantee French security through the development of a national nuclear deterrent, independent of NATO. France left the military wing of NATO in 1966 and structured its nuclear forces to provide only for French security. President de Gaulle contended that there could be no absolute certainty that the United States would retaliate against the Soviet Union with nuclear weapons --- and thereby risk an attack on the US itself --- should the Soviet Union launch a nuclear attack against France. The French government acknowledged that it could not hope to build a large or a devastating nuclear force, as the Soviet Union or the United States. French officials contended, however, that such a force was not necessary to guarantee French security. "For it is clear that to deter a would-be aggressor", wrote France's Minister of Defence, Michel

---

19. David S. Yost, "Ballistic Missile Defence and the Atlantic Alliance", International Security (Massachusetts), Fall 1982, pp. 145-152

Debre, in 1971, "does not require parity of nuclear armament but simply the ability to bring to bear on him a threat proportionate to the importance he attaches to the desired conquest".[20]

Britain did not challenge the good faith of the US nuclear guarantee, but contended instead that its own nuclear force played an important strategic role and it added to Western deterrence by complicating the uncertainities faced by Soviet planners, charged with designing Soviet offensive strategy.[21] Both France and Great Britain recognised that the Soviets' potential combination of large number of offensive delivery systems and ABM system could overwhelm their own nuclear forces and make a destructive counter-strike on their part of a negligible threat. Without an agreement restricting Soviet offensive and defensive capabilities, the French and British deterrents might prove to be of diminishing validity. "The security of Europe" wrote Debre, "can rest only on deterrence and on the strategic nuclear

---

20. Michel Debre, "France's Global Strategy", Foreign Affairs, April 1971, pp. 398-399; see also, Robbin F. Laird, "The French Strategic Dilemma", Orbis (Philadelphia), Summer 1984, pp. 307-328.

21. Lawrence Freedman, "The Small Nuclear Forces", NATO's Sixteen Nations, December 1983-January 1984, p. 27.

weapon which is its instrument".[22] Michael Steward, Britain's Secretary of State for the Foreign Office, outlined his Government's argument for a Soviet-US agreement:

> I am confident that the US Government will not lose sight of the need to maintain the credibility of its nuclear commitment to Europe. As to the nature of an agreement, with our nuclear experience Britain is well placed to appreciate the problems involved in reaching an accord. All members of the Alliance must recognize the advantages of setting any agreed level of strategic armaments as low as possible. However, the development of interacting systems, and in particular the ... ABM and ... MIRV systems, makes this more difficult as time goes on. I hope it is not too late to limit them.23

Above all, the European NATO allies believed that an arms limitation agreement would reduce East-West

---

22. Debre, n. 20, p. 404.

23. Michael Steward, "Britain, Europe and the Alliance", Foreign Affairs, July, p. 653. For further details see, Wilhem Grewe, The Effect of Strategic Agreements on European-American Relations (Adelphi Papers, International Institute for Strategic Studies, February 1970, London), p. 20.

tensions. They argued that deterrence was an escapable evil of the nuclear age, but could be made more palatable in an era of detente. In their view, detente could help to assure that differences between the NATO states and the Soviet Union would not ultimately result in nuclear war. Wilhelm Grewe, the Federal Republic of Germany's (FRG) Ambassador to NATO, wrote in 1970 that "the further escalation of the arms race between the super powers is considered dangerous and ruinous; the stabilization of the mutual deterrence is regarded as desirable and even urgently necessary in the interest of preventing nuclear war."[24] Many of those in favour of restrictions on ABM defences underscored the limited effectiveness of such systems against ICBMs, and noted that they would provide no credible defence against ground-hugging cruise missiles launched from submarines or against manned bomber forces. ABM systems, in their view, only invited a build-up of offensive missile forces able to overwhelm them. "We have become numbed by the numbers game we play with nuclear weapons", wrote Jerome B. Wiesner, an advocate of SALT, "and have lost track of their power and what a few of them can do".[25]

---

24. Ibid., p. 22.

25. Jerome B. Wiesner, "Arms Control: Current Prospect and Problems", Bulletin of the Atomic Scientists (Chicago) May 1970, p. 7.

**The ABM Treaty of 1972**

On 26 May 1972, the United States and the Soviet Union signed the Treaty on the Limitation of Anti-Ballistic Missile System. The Senate ratified the Treaty in August of the same year and President Nixon signed it on 30 September 1972. The Preamble of the Treaty states that limiting ABM systems "would be a substantial factor in curbing the race in strategic offensive arms and would lead to a decrease in the risk of outbreak of war involving nuclear weapons". In addition, the signatories expressed the hope that the Treaty "would contribute to the creation of more favourable conditions for further negotiations on limiting strategic arms".[26] The Treaty is of unlimited duration, and is reviewed for possible amendment at five-year intervals. Either party may withdraw from the agreement, with six months prior notice "if it decides that extraordinary events related to the subject matter of (the) Treaty have jeopardized its supreme interests".[27] The two signatories reviewed the Treaty in 1977 and again in the Fall of 1982, without amending it.

---

26. Gallis, n. 12, p. 10.

27. Ibid.

The ABM Treaty, as amended by a protocol in 1974, allows the deployment of one fixed, land-based anti-ballistic missile system. Article V of the Treaty prohibits the development, testing or deployment of sea-based, air-based, space-based or mobile ABM systems. Ambassador Gerald Smith, the principal American negotiator of the Treaty, told the Senate Armed Services Committee in July 1972, that the obligation not to develop ABM systems allowed laboratory research but prohibited field testing prototypes. Laboratory development and testing was not barred because both sides agreed that there was no dependable means to monitor or verify such research.[28] Ambassador Smith also told the Committee that no future types of ABM systems "based on other physical principles ... can be deployed unless the Treaty is amended". The term "other physical principles" has been interpreted to cover laser technologies. Research in such laser or other "directed energy" systems is permitted. Field testing and deployment of such systems is prohibited if they are to be space-based.[29]

---

28. Sidney D. Drell, Philip J. Farley and David Holloway, "Preserving the ABM Treaty", International Security, Fall 1984, p.57.

29. This terminology is specifically used in the statement of agreed interpretations affixed to the 1974 Protocol which amended the original Treaty. For details see, Pamela Meredith, "The Legality of a High-Technology Missile Defense System", American Journal of International Law (Washington, D.C.), Vol. 78, no. 2, 1984, p. 420.

In addition, the Treaty restricts the number and location of radar systems in support of an ABM defence. A signatory choosing to place its one allowed ABM system at an ICBM site is permitted two large phased-array radars at that site. Article IX of the Treaty prohibits the transfer of "ABM systems or their components" to other nations, a provision intended to limit the potential proliferation of such systems, even among the allies of the signatories.

American Congress voted to deactivate the United States' one operational SAFEGUARD ABM system around Grand Forks in 1975. The Soviet Union maintains its one allowed ABM system around Moscow.

**Western Europe and the ABM Treaty**

The United States' West European allies have treated the ABM Treaty as a landmark in arms control in the nuclear age. For France and Britain, the observation of the Treaty by the Soviet Union has preserved the rationale for their costly independent nuclear forces: a limited ABM deployment in the Soviet Union in the future might well seem formidable against their own small nuclear forces, while remaining ineffective against a much larger offensive capability, such as that of the United States.

Other West European States view the ABM Treaty as an important sign that detente can yield significant agreements between the two super powers.[30] For this reason, discussion of new ABM systems often meets with skepticism and concern from the allies. They have strongly supported the Treaty because in their view it serves to preserve known, and accepted, vulnerabilities. The Treaty thereby prevents a step into a new era which, in the view of some, could trigger a series of unknown countermeasures by each side, as the Soviet Union and the United States seek to develop new means and new weapons to penetrate an improving defence. In the words of two strategic analysts, "even if a weapon system appears technically feasible, it need not necessarily be appropriate for deployment".[31] In sum, it could be stated that West Europeans are very sensitive to any possible amendment or violation of ABM Treaty.

---

30. Gallis, n. 12, p. 12.

31. Keith B. Payne and Rebecca V. Strede, "Space-Based Laser BMD: Strategic Policy and the ABM Treaty", International Security Review, Fall 1982, p. 276. For a similar point made by a British strategic thinker, see Lawrence Freedman, "NATO and the Strategic Defence Initiative", NATO's Sixteen Nations, November 1984, p. 20.

## NUCLEAR WEAPONS IN EUROPE

At the end of the Second World War, the United States emerged as a formidable global and military power, with the monopoly of nuclear weapons. However, the emerging Superpower, the United States, soon found that its military power and atomic monopoly could hardly influence the Soviet policies in Eastern Europe. Indeed, the Soviet military presence in most of the East European countries at the end of the Second World War, continued, inspite of American demobilization of its forces from Europe by 1948.[32] Moreover, the Soviets converted its military presence into a sphere of its exclusive influence. These developments were perceived by the US to be aggressive in nature and affecting its and European allies' security. Hence, the US policy makers formulated a policy of containment of Soviet Union along with the European allies cooperation and participation. The Truman doctrine (1947), Marshall Plan (1948) and the North Atlantic Treaty Organisation (1949) were all manifestations of the containment policy.

The United States had two goals in mind when it created the North Atlantic Treaty Organisation (NATO)

---

32. Christopher S. Raj, American Military in Europe: Controversy over NATO Burden, Sharing (New Delhi: ABC Publishers, 1983), pp. 4-5.

on 4 April 1949: (1) to contain Soviet expansionism; and (2) to restore Western Europe as a centre of economic, political and military power, capable of standing on its own against threats from the Soviet Union. The Treaty pledged to give political support for European economic recovery and was backed by the United States' strategic nuclear bombing force. In August 1949, the Soviet Union exploded its nuclear device, leading to the end of United States' nuclear monopoly. Thus, an arms race in the atomic field emerged in close competition with the acquisition of thermonuclear devices by both the superpowers, by the year 1952-53. In the prevailing nuclear stalemate the role of conventional forces assumed importance and simultaneously the myth of Soviet predominance in conventional weapons prevailed on Europe. To counter this conventional predominance, the US formulated a strategy called Massive Retaliation for NATO and in concurrence with the European allies deployed tactical weapons in Europe.

Massive Retaliation meant that at any level of aggression, both nuclear and conventional, by the Warsaw Pact, an all out nuclear response was formulated. Massive

---

33. R.E. Osgood, NATO: The Entangling Alliance, (Chicago: University of Chicago Press, 1957), p. 107.

Retaliation became NATO's official doctrine in December 1954 (MC-14/2). Significantly, along with the growth of strategic bomber forces there was increasing deployment in Europe of tactical weapons like Honest John, Corporal (short range under 100 miles missiles), surface to surface missiles, sea-based regular and land-based matador (long range over 500 miles), subsonic cruise missiles.[33]

Soon it became clear that Russians were beginning to stockpile thermonuclear weapons vastly improving their ballistic missile and jet bomber technology. In August 1957, USSR tested its first ICBM and in October, the Soviets launched their space satellite, Sputnik. These developments produced an euphoria of "missile gap" and an extensive debate ensued on "missile gap" both in public and among policy makers in the US and Europe. This debate eroded European confidence in the credibility of the American nuclear guarantee. The arguments of the proponents of "missile gap" were strengthened by the deployment of additional Soviet IRBMs (SS4 and SS5) in the western reaches of the Soviet Union. This further contributed to the Allied uneasiness about their security.

To restore the American credibility, NATO nuclear posture was strengthened in December 1957. The NATO Heads

decided in the NATO Council meeting, held in Paris, to establish a stockpile of American nuclear warheads in Western Europe, and to develop American intermediate range ballistic missiles (IRBM) in NATO countries willing to accept them. Through 1958-59 Jupiter and Thor IRBMs were deployed in Italy, Turkey and United Kingdom.[34] These countries accepted the American offer to deploy IRBMs under the double veto system - that is, each country concerned - and the US were required to authorize the joining of the warhead to the missile for employment in various contingencies. However, Denmark, Norway and France refused the offer because the US under the arrangement, owned the missiles and controlled the warheads. They feared that such an arrangement, would give the US complete control over the employment of nuclear weapons, in various contingencies.

Furthermore, European allies refused to deploy these missiles because of the following reasons :(1) In the event of a war breaking out, the Europeans feared that they would be under a great threat, if they opted for the deployment of the American missiles. This would result in Soviet targeting of such missiles. There was

---

34. Raj, n. 32, pp. 60-61.

also a presumption that if the Europeans rejected the IRBMs, they would be spared by the Soviets. (2) Both Thors and Jupiters were liquid-fuelled and based above ground in fixed positions. Given the lack of protection, plus the necessity of long fuelling times, both the missiles were regarded as highly vulnerable to Soviet pre-emptive attack. (3) Finally, these missiles raised fears that the US was drawing a distinction between its own security and that of its NATO allies. In the context of the US-Soviet strategic balance, IRBM deployment led to a feeling that the US was planning to confine potential nuclear conflict with the Soviet Union to European soil.[35]

By the early 1960s, steady advances in the quality and number of Soviet strategic nuclear weaponry had made US leaders apprehensive about the Massive Retaliation strategy of direct resort to the use of strategic weapons against Soviet territory, in the event of a Soviet attack on Western Europe. Therefore, the American policy makers reviewed their strategic policy. In 1962, the US President proclaimed a new strategy for the US and appealed for NATO's approval. This was called flexible response strategy.

---

35. J.D. Boutwell, Doty and G.F. Treverton, The Nuclear Confrontation in Europe (London: Croom Helm, 1985), pp. 16-17.

This strategy essentially involved attaining a capability to react across the entire spectrum of possible challenge (essentially from the Soviets) from a general atomic war to infiltration and aggression as in Laos and Berlin in 1959. In 1962, Secretary of Defence, Robert McNamara explained in detail, the nuclear context of the Flexible response strategy. He contended that this strategy was both effective deterrent and the best preparation for potential conflicts needing second strike capability. This capability required that American strategic nuclear forces be configured, in such a way, that they enable them to absorb a Soviet first strike and yet retain the ability to retaliate massively against the USSR. This capability was to be achieved through the deployment of Polaris missile-launching submarines, and Minuteman ICBMs in hardened silos, thus inhibiting the Soviets not to strike the western cities.[36]

The "Flexible Response" strategy was adopted by NATO in 1967. It was a compromise between European and American interpretations of the appropriate level of response. On the one hand, it reflected the European distaste for either a prolonged conventional war or a nuclear war

---

36. New York Times, 7 June 1962.

fought on their territory and on the other, the American increase with rapid escalation to inter-continental nuclear exchange with USSR.[37]

The doctrine of flexible response may have deterred the Soviet Union but it did not reassure the Europeans. It may have deterred because, even a small probability that the US might come to the defence of Western Europe with nuclear weapons, was probably enough to deter the Soviet Union. On the contrary, even a large probability of such a response would not suffice to reassure European allies. It seemed to many Europeans that the US was actually making a distinction between American and allied security, and the US's strategic nuclear forces were being decoupled from the rest of NATO's defence apparatus. Moreover, the Europeans felt that the flexible response doctrine compartmentalised NATO: the US assuming the responsibility for global security and nuclear strategy and the Europeans being told to upgrade conventional forces for continental defence.

Thus, the American proposals of late 1950s and early 1960s, produced growing differences between the

---

37. Olive and J.D. Porro, Nuclear Weapons in Europe: Modernization and Limitation (Lexington: D.C. Heath and Co., 1983), p. xiii.

US and Europe. One of the clearest manifestations of these differences was the fact that both Britain and France challenged American thinking, by pursuing independent nuclear programmes.[38]

By the 1970s, NATO's nuclear arsenal comprised a modest British force of Polaris SLBMs, medium range Vulcan bombers and short range Bucaneer strike aircraft, fully integrated into NATO assigned force of several hundred polaris SLBMs and carrier based aircraft and 700-1000 warheads for use on land-based systems, demolition mines and a variety of short range missiles and artillery pieces. While presumably deployed primarily to deter Soviet Union, the French nuclear arsenal comprising Mirage strike aircraft, submarine-launched ballistic missiles and the shorter range Pluton missile were independent of NATO's command and control.[39] The following three tables provide at a glance the Nuclear arsenal of the Super Powers and their allies in Europe.

---

38. C. McArdle, Kelleher, Germany and Politics of Nuclear Weapons (New York: Columbia University Press, 1975), pp. 157-78.

39. Marsha, M.C. Graw Olive, J.D. Porro (ed.), Nuclear Weapons in Europe: Modernization and Limitation (Lexington: DC Heath and Co., 1983), pp. 53-55.

## US-Soviet Central Strategic Balance

| U.S. | | | | Soviet Union | | | |
|---|---|---|---|---|---|---|---|
| System | No. deployed | Warhead | Total warheads | System | No. deployed | Warhead | Total warhead |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| ICBM | | | | ICBM | | | |
| Minuteman II | 450 | 1 | 450 | SS 11 | 448 | 1 | 448 |
| Minuteman III | 550 | 3 | 1650 | SS 13 | 60 | 1 | 60 |
| Titan | 10 | 1 | 10 | SS 17 | 150 | 4 | 600 |
| | | | | SS 18 | 308 | 10 | 3080 |
| | | | | SS 19 | 360 | 6 | 2160 |
| | | | | SS 25 | 72 | 1 | 72 |
| TOTAL : | 1010 | | 2110 | | 1398 | | 6420 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| SLBM | | | | | | | |
| Poseidon $C_3$ | 256 | 14 | 3584 | SS-N-6 | 304 | 1 | 304 |
| Trident $C_4$ | 384 | 8 | 3072 | SS-N-8 | 292 | 1 | 292 |
| | | | | SS-N-17 | 12 | 1 | 12 |
| | | | | SS-N-18 | 224 | 7 | 1568 |
| | | | | SS-N-20 | 80 | 9 | 720 |
| | | | | SS-N-23 | 32 | 10 | 320 |
| TOTAL : | 640 | | 6656 | | 944 | | 3216 |
| BOMBERS | | | | | | | |
| $B_{S2}$ G/H(Non (ALCM) | 121 | 12 | 1452 | Bear H(ALCM) | 40 | 20 | 800 |
| | | | | Bear (non ALCM) | 100 | 2 | 200 |
| $B_{S2}$ C/N(ALCM) | 120 | 20 | 2400 | Bison | 20 | 4 | 80 |
| B-1 | 19 | 12 | 228 | | | | |
| TOTAL Bombers | 260 | | 4080 | | 160 | | 1080 |
| GRAND TOTAL | 1910 | | 12846 | | 2502 | | 10716 |

SOURCE: Military Balance 86-87, p. 222.

US-West European Theatre Nuclear Forces

| Category & Type | Year of deployment | Range (Kms.) | No.deployed in Europe | No. deployed by USA | Total | Countries deploying |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| LAND BASED<br>Intermediate Range | | | | | | |
| IRBM SSBSS-3/D/TN-61 | 1980 | 3500 | 18 | | 18 | France |
| GLCM<br>BGM-109G | 1983 | 2500 | 1 | 128 | 128 | USA |
| MRBM: Pershing II | 1983 | 1790 | | 108 | 108 | USA |
| SRBM | | | | | | |
| Pershing 1A | 1962 | 160-720 | 72 | | 72 | FRG |
| Lance | 1972/6 | 110-125 | 55 | 108 | 163 | USA,Belgium(5), Britain(12),FRG (26),Italy(6), Neth.(6) |
| Pluton | 1974 | 120 | 44 | | 44 | France |
| Honest John | 1954 | 38 | | | 91 | U.S. |
| Artillery (dual) capable) M-110 | 1962 | 168 | 373 | 500 | 873 | US,Belgi(11),Br (16), FRG(226), Greece(23),Italy (12),Neth.(76) |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| M-109 | 1964 | 18 | 1659 | 500 | 2159 | US, Bel (168), Br (101), Canada (56), Den.(72), FRG (586), Greece(108), Italy (220), Neth.(218), Norway(130), Pol.(6) |
| SAM (dual cap) | | | | | | |
| Nike Hercules | 1962 | 140-60 | 433 | | 433 | Bel(36), FRG (216), Italy (96), Neth. (23), Turkey (72). |
| Sea based SLBM | | | | | | |
| Polaris A3 | 1967 | 4600 | 64 | | 64 | 3XMIRV with Chevaline S8 warhead Br. |
| UGM-73A Poseidon 3 | 1971 | 4600 | | 256 | 256 | USA |
| MSBS M-20/TN-60 | 1977 | 3000 | 80 | | 80 | France |
| MSBS M-4/TW-70 | 1985 | 4400+ | 16 | | 16 | France |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| SLCM | | | | | | |
| BGM-109A Tomahawk | 1984 | 25000 | | 166 | 166 | USA |
| AIR Land based | | | | | | |
| F-104 G/S | 1958 | 2400 | 271 | | 271 | FRG(190), Greece(66), Italy (18), Turkey (97) |
| F-4 E/F | 1967/73 | 2200 | 167 | | 167 | FRG (60), Greece (47), Turkey (60), |
| F-4 E | | 1060-2400 | | 96 | 96 | USA |
| F-111 E/F | | 1060-2400 | | 150 | 150 | USA |
| F-16 | 1982 | 3800 | 243 | | 243 | Bel (36), Den (64), Neth (76), Norway (68), |
| F-16 | | 3800 | | 144 | 144 | USA |
| Mirage IVA/P | 1966-86 | 3200 | 30 | | 30 | France |
| Mirage T11E | 1964 | 2400 | 30 | | 30 | France |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Jaguar A | 1974 | 1600 | 45 | | 45 | France |
| Tornado | 1981 | 2800 | 358 | | 358 | Br (170), FRG (124), Italy (64) |
| Carrier based Strike | | | | | | |
| Super Etendard | 1980 | 1500 | 38 | | 38 | France |
| A-7/E 18 | | | | 48 | 48 | USA |
| ASW | | | | | | |
| P-3B/C | 1961 | 2500 | 20 | | 20 | Neth (13), Nor ( 7) |
| S-3A | 1964 | 2500 | | 20 | 20 | USA |
| P-3B/C | 1964 | 2500 | | 12 | 12 | USA |
| Nimrod | 1969 | 9000 | 28 | | 28 | Br |
| Atlantic | 1965 | 3800 | 55 | | 55 | Fr (27), FRG(14), Italy (4) |
| MSBS M-20/TN-60 | 1977 | 3000 | | | 80 | France |
| MSBS M-4/TN-70 | 1985 | 4400+ | | | 16 | France |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| AIR | | | | | | |
| Tactical, landbased | | | | | | |
| F-104 G/S | 1958 | 2400 | | | 271 | FRG (90), Greece (66), Italy (18), Turkey (97) |
| F-4 E/F | 1967-73 | 2200 | | | 167 | FRG(60),Greece (47), Turkey(60) |
| F-16 | 1982 | 3800 | | | 243 | Bel(36),Denmark (64), Neth.(76), Nor (68). |
| Mirage IVA/P | 1966-86 | 3200 | | | 22/8 | France |
| ASM PASM | 1986 | 100 | | | - | On Mirage IUP France |
| Mirage T4E | 1964 | 2400 | | | 30 | France |
| Jaguar A | 1974 | 1600 | | | 45 | France |
| Tornado | 1981 | 2800 | | | 358 | Br(170), FRG(124), Italy (64) |
| Carrier based strike | | | | | | |
| Super Etendard | 1980 | 1500 | | | 38 | France |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ASW | | | | | | |
| P-3B/C | 1961 | 2500 | | | 20 | Neth (13), Norway (7) |
| Nimrod | 1969 | 9000 | | | 28 | Britain |
| Atlantic | 1965 | 3800 | | | 55 | France (27), FRG (14), Italy (4) |

SOURCE: Military Balance 86-87 (London) pp. 202-203; 222-223

## Warsaw Pact Theatre Nuclear Forces in Europe

| Category and Type | Year of deployment | Range (Km) | No. deployed | Countries deploying |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| Land Based Missiles | | | | |
| SS-11/17/19 | 1971/74 | 9942/19440 | 958 | USSR |
| SS-4 | 1959 | 2000 | 112 | USSR |
| SS-20 | 1977 | 5000 | 270 | USSR |
| SRBMs | | | | |
| SS-21 (Frog) | 1978 | 120 | 350 | USSR |
| SS-23 (Scud) | 1985 | 350 | 375 | USSR |
| S-12 | 1969/78 | 800-900 | 77 | USSR |
| Frog 3-5-7 | 1965 | 70 | 214 | Allies |
| Scud B/C | 1965 | 280 | 143 | Allies |
| Artillery | | | | |
| M-1976 $S_{23}$ | 1978 | 27 | 1500 | USSR |
| M-1955 (D-20) | 1955 | 174 | 2500 | USSR |

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| M-1973/2S$_3$ | 1972 | 27 | 3500+ | USSR |
| M-1975 how | 1975 | 18 | 2000 | Allies |
| M-1955 MOR | 1975 | 12.7 | 200 | Allies |
| M-1955 (D-20) | 1975 | 17.4 | 220 | Hungary (100), Romania (50), Bulgaria (20), GDR (50) |
| M-1973/2S$_3$ | | | 164 | Allies |
| Sea-based SLBM | | | | |
| SS-N-5 | 1964 | 1400 | 39 | USSR |
| SLCM | | | | |
| SS-N-3 | 1962 | 450 | 244 | USSR |
| SS-N-7 | 1968 | | 80 | USSR |
| SS-N-9 | 1969 | 100 | 218 | USSR |
| SS-N-12 | 1973 | 550 | 120 | USSR |
| SS-N-19 | 1980 | 550 | 112 | USSR |

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| ASW | | | | |
| SS-N-14 | 1974 | 55 | 288 | |
| SS-N-15 | 1982 | 45 | 396 | |
| SS-N-16 | 1962 | - | 306 | |
| SS-N-22 | 1981 | 400 | 52 | |
| Fras/Rockets | 1975 | 35 | 10 | |
| Air, Strategic Long Range Bombers | | | | |
| Bear Tu-85 | 1956 | 12,800 | 140 | |
| Bison Mya-4 | 1956 | 11,200 | 20 | |
| Medium Range | | | | |
| Badger Tu-16 | 1955 | 4800 | 480 | |
| Backfire Tu-22M | 1974 | 11,000 | 260 | |
| Blinder Tu-22 | 1962 | 6200 | 165 | |
| Tactical Land based strikers | | | | |
| Fitter Su-7 | 1959 | 1450 | 90 | Poland (40), Czechoslovakia(50) |

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Fishbed MIG-21 | 1970 | 1100 | 135 | |
| Flogger MIG-27 | 1971 | 1400 | 810 | |
| Fitter Su-17 | 1974 | 1300 | 900 | |
| Fitter A Su-7 | 1959 | 1400 | 90 | |
| Fitter C Su-20 | 1974 | 1300 | 40 | Poland (40) |
| Fencer Su-24 | 1974 | 3600 | 700 | |
| MIG-23 | 1975 | 62,500 | 109 | Bulgaria (45), E. Germany(24), Czeslovakia(40) |
| ASW | | | | |
| Bear Tu-142 | 1972 | 11,500 | 60 | |
| May Jl-38 | 1970 | 7200 | 50 | |
| Man Be-12 | 1965 | 7500 | 95 | |
| ALCM (dual capable) | | | | |
| Kipper AS-2 | 1961 | 200 | 90 | |
| Kangaroo AS-3 | 1961 | 500 | 100 | |

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Kitchen AS-4 | 1962 | 300 | 410 | |
| Kingfish AS-6 | 1977 | 300 | 820 | |
| Kingfish AS-15 | 1984 | 1600 | 240 | |

SOURCE: Military Balance 86-87 (London) p. 204-206

## CHAPTER II

## POLITICO-STRATEGIC IMPLICATION OF SDI ON EUROPE

Ever since the formation of NATO alliance the West Europeans have been subjected to American unilateralism in the formulation of military and strategic policy. The SDI research programme announced by President Reagan also followed this pattern. The European governments were neither consulted nor briefed by President Reagan when he announced a major strategic innovation directly affecting their security. It was only after a year (April 1984) in the NATO Planning Group that the Reagan Administration formally and officially informed the nature and content of the SDI programme. The U.S. Administration's complete failure to inform the Europeans about the change in the defence strategy primarily, if not exclusively, lead to a strong impression that it was intended to protect the U.S. only, thus reinforcing an ongoing resentment of the resurgent American unilateralism.

### European Debate and Attitudes

When Reagan announced the SDI programme in March 1983, the US debate on it focussed on the technological feasibility and the strategic implications. However, for

the European allies, the immediate question of technological feasibility had been eluded and the long term questions regarding strategic implications had been intermittent. The reasons for these trends had been :

1. It was not until later 1984 that the European Governments did become seriously involved in the SDI debate. By then, the debate in the US had shifted from the technological feasibility of perfect area defences towards the possibilities in more limited types of systems.

2. Unlike Europeans, the US strategic community including many scientists had a long history of involvement not only in the research and development of weapons technologies but in the policy debates regarding them. The US scientific community was able to debate on the subject but no European nation could play a similar role in the development of American weapon systems because European nations lacked such a community.

3. Since the ABM Treaty permitted research on Ballistic missile defence systems, most Europeans were willing to support research on SDI, even as a hedge against a Soviet breakthrough. (1)

In November and December 1984, a study group of the Congressional Research Service (American Library of Congress) conducted interviews in the NATO countries. They

---

1. J.H. Daalder, L.P. Whittaker, "SDI's Implications for Europe: Strategy, Politics and Technology" in Flanagun and Hampson (edited), Securing Europe's Future (London: Croom Helm, 1986)p. 37.

interviewed government officials as well as non-governmental specialists in foreign affairs and defence policy. The Congressional Research Service Report published in February 1985 pointed out that every interview with an official from a NATO government, expressed the opinion that research and development on ballistic missile defence should go forward, for the Soviet Union will certainly continue to mount a similar research effort itself. The report noted that the representatives of the opposition, SPD in the Federal Republic of Germany (FRG), argued that the U.S. and the Soviet Union must adjure a research and development programme: in their view, research and development alone, without deployment, would be sufficient impetus to propel the arms race forward by pushing each side to develop newer offensive weapons able to penetrate a missile defence.[2]

Though the viewpoint of SPD was clearly in a small minority, many officials in Europe expressed apprehension that a vigorous, full-scale research and development program could fuel East-West tensions and eventually touch off a new, and unwanted, arms race. The CRS reported that some of the European officials indicated that there was

---

2. Paul E. Gallis, et al, The Strategic Defence Initiative and United States Alliance Strategy (Congressional Research Service, Library of Congress, February 1985, Washington D.C.), p. 20.

no clear evidence to suggest that the Soviets have made a sudden or intensified push to achieve a significant break through in anti-satellite technology.[3]

Pierre Lellouche, the Associate Director of the Institute Francis des Relations Internationales and a strong supporter of NATO, expressed a concern about pursuing the research and development programme. He pointed out that once the United States embarked upon a full-scale research and development effort, with defence contracts obtained by American companies across the nation, many members of American Congress would have a vested interest in assessing the programme funded, in order to protect the economic interests of constituents in their districts or states. In the event of such a development, Lellouche concluded, production of new ABM system would be difficult to terminate no matter how detrimental they might ultimately prove to be to American strategic interests.[4]

A similar sentiment had been voiced in Britain. In October 1984, the House of Lords debated SDI. In a colloquy with the Parliamentary Under Secretary of State

---

3. Ibid.

4. Ibid., p.22.

for the Armed Forces, Lord Trafgarne, Lord Kennet asked, even though SDI was in fact only a research programme currently, could it be imagined "that once 28 billion dollars have been spent on research, any American President, whoever he is, will be able to face down the military-industrial complex when they demand continuity of employment....?"[5]

Some of Britain's leading newspapers have expressed support for SDI. The London Times editors endorsed the programme, and in July 1984 British Journalist Adrian Berry wrote in strong support of SDI in the Daily Telegraph, arguing that :

> ...It may or may not be possible to construct such laser battle stations. That depends, not so much on developing the appropriate laser, which is already near to being possible, but rather on improving the speed and power of computers.
>
> But whether technically possible or not... it ought to be attempted. It would be far cheaper than building nuclear warheads indefinitely, and if it does not work, no great harm would have been done. (6)

Reaction in the British community is not unlike that in the United States - some scientists oppose SDI

---

5. Daily Telegraph, 25 October 1984

6. Ibid., 19 July 1984.

and some support it. Sir Ronald Mason, chief scientific adviser in the British Ministry of Defence from 1970 to 1983, wrote in July 1984 that SDI "might represent a future allocation of resources conflicting with other developments designed to strengthen political and military stability within and outside NATO".[7] Citing the technological problems with building a 100 percent perfect defence, Mason expressed his fear that rather than giving up on ICBMs in response to deployment of an SDI type system, the Soviets would "increase their ICBM numbers, alter certain technologies, and change the overall balance of delivery system. This is scarcely a major contribution to arms control negotiations in the next decade".[8]

Sir Martin Ryle, a professor of radio astronomy at Cambridge University, who worked on radar development during the Second World War, attacked SDI on technical grounds in a 12 July 1984 editorial, suggesting that an Adviser in Basic Physics be appointed in the Kremlin and the White House, "so that phoney systems proposed by the scientists of the weapons industries which have got through

---

7. Ronald Mason, "Star Wars: An Alternate View", Aerospace America, July 1984, p. 24.

8. Ibid.

the evidently naive military experts can be examined by an impartial individual before they receive approval".[9]

On the other side, Scientists associated with the British Government were considerably favourable to the SDI project. In fact, they were excited about possible technological "spin-offs" from the SDI programme for other military space programmes, regardless of whether SDI resulted in a system that would ultimately be deployed.[10]

**European Strategic Consensus**

The immediate reaction to the SDI programme was disbelief, concern and confusion. There was concern because none of the allies were consulted or even informed in advance of the programme which represented a fundamental change in strategic policy. UK and France were immediately concerned about the efficacy of their independent nuclear deterrents in a defence-dominated world. Some even felt that owing to the imperfect nature of the defence, it might result in different regions of the alliance being defended less efficiently than others. There was disbelief because it seemed impossible that a defensive strategy could be a viable alternative to the strategy of deterrence based on the mutual threat of nuclear destruction.

---

9. Cited in Gallis, n.2, p.24.

10. Ibid.

These European concerns found expression in the questions raised by the British Prime Minister Margaret Thatcher and Foreign Secretary Geoffrey Howe. On 22 Dec., 1984, British Prime Minister while meeting President Reagan at Camp David remarked that her support for research under SDI would be forthcoming, so long as it did not infringe on any of the treaties. "Research is within existing agreement", Thatcher said. "If the result is such that it is decided to go ahead with production and deployment, then that has to be a matter of negotiations before these deployments could take place". She added that the object of such deployments should be "to enhance and not to undermine deterrence.."[11]

These conditions indicated concern of possible effects of SDI on European security.

In early 1985, the allied governments began to endorse the SDI research programme. While this collective support was agreed upon as a short term objective, there were still doubts about the long term implications for the alliance. These were articulated by British Foreign Secretary Geoffrey Howe in his speech on 15 March 1985:

---

11. "Thatcher Cautions on Star Wars", Washington Post, 17 December 1984.

> "There would be no advantage to creating a new Maginot line of the 21st century, liable to be outflanked by relatively simpler and demonstrably cheaper counter-measures...We must be sure that the United States' nuclear guarantee to Europe will indeed be enhanced not at the end of the process but from its very inception...(12)

Howe elaborated four other points of European concern. He pointed out that a perfect or near perfect defensive sheild, deployed unilaterally would give the possessor a clear superiority and a first strike capability. While U.S. asserted that it does not seek such a superiority, Howe emphasised that "we would have to ensure that the perceptions of the others were not different".[13]

Howe observed that even if research does not lead to development and deployment of new systems, the momentum of research does undermine the arms control regime embodied in the ABM Treaty. Moreover, promoting technological research prior to an analysis of the possible political and strategic implications of the project for strategic stability, East-West relations, and military efficacy, politics will be at the mercy of technology rather than vice-versa. Hence Howe emphasised, "We must take care

---

12. Bhupendra Jasani (edited), Space Weapons and International Security (New York: SIPRI & Oxford University Press, 1987), p. 47.

13. Ibid.

that political decisions are not pre-empted by the march of technology. Still less by premature attempts to predict the route of that march".[14]

Thirdly, according to Howe, "Deterrence has worked; and it will continue to work. It may be enhanced by active defences. Or their development may set us on a road of diminished security - unfortunately we have to face the harsh realities of a world in which nuclear weapons exist and cannot be disinvented". Therefore, Howe pointed out that European Governments who believed in the justification of nuclear deterrence, viewed President Reagan's wish to overcome this 'immoral' posture with apprehension.

Finally, Howe observed that a defence arms race might stimulate an offensive arms race also. Moreover, American goal of "radical cuts might make the need for active defences superfluous",[15] Howe said.

Similar concerns had been raised by German Minister for Defence, Manfred Woerner at the NPG meeting in April 1984. He criticized the programme on the following lines.

---

14. Ibid.

15. A similar view has been expressed by Chancellor Helmut Kohl in his speech to the CDU Congress, 20 March 1985.

A perfect-ballistic missile defence could not be achieved. If both sides were to develop and deploy partially effective defences, it could lead to an increase in tension because of the fear that one side might develop a first strike capability with its second strike arsenal partially protected by a B.M.D. shield. The result of these fears would be an accelerated arms race. SDI threatened the basic principle which kept the NATO alliance together, namely the sharing of equal risks in the defence of freedom. There was consequently a fear that Europe might be "psychologically decoupled".[16]

Despite numerous American attempts at NATO meetings, the allies had been unwilling to endorse the concept of strategic defences, and so far have only supported the legitimacy of research with reservations. This necessitates the examination of SDI and its implications on the following strategic aspects :

1. ABM Treaty
2. Deterrence
3. Nuclear Deterrents of Britain and France
4. Arms Race, Arms Control and East-West stability

---

16. Thomas Risse-Kappan, "Western Europe and Nuclear Arms Control: The Cases of INF and SDI", Bulletin of Peace Proposals, (Toxen), Vol.16, no.3, 1985, pp. 283-89.

**ABM Treaty, 1972**

There is a general agreement between the US administration and the arms control critics on the scope and the meaning of the ABM Treaty at the research level. However, they disagree on whether US starting in 1988 under the SDI the field-testing of components and integrated systems and the ATBMs in Europe, and Soviet construction of large phased array radars (LPARS) would be violations of the ABM Treaty. The Soviets have alleged that SDI violates the ABM Treaty.[17]

The Reagan Administration has alleged that LPAR now under construction in Soviet Krasnoyarsk, concurrent tests of ABM systems and surface-to-air missiles, a potentially mobile ABM radar and tests of SA-X-12 against medium range ballistic missile are clear violations of the ABM Treaty.[18]

The Soviets have contended that Krasnoyarsk radar is only for tracking space vehicles, a function that is

---

17. Report to the Congress on SDI, "The SDI and ABM Treaty", (Washington D.C.: Department of Defense, 18 April 1985), Appendix-B.

18. President's Report to the Congress, "Soviet Noncompliance with Arms Control Agreement"(Washington D.C.: Government Printing Office, 2 February 1985), pp. 2, 7-9.

allowed by the treaty. Moreover, the deployment of two new land-based missile systems was upheld on the argument that modification and modernization fall within the limits set by SALT-II (allows one missile system).

Britain does not regard either of these cases as a violation. At a meeting of NATO Defence Ministers in Luxembourg in March 1985, Michael Heseltine said, "Britain wouldn't be badgered into supporting America on the compliance issues; - we need to find a solution to Krasnoyarsk. Everyone in Washington is more interested in using the issue and not resolving it".[19]

However, the deployment of SDI would present an ultimatum to the Soviet Union to agree for the amendment of the following clauses of the ABM Treaty and hence allow SDI to develop and test space based ABM components till 1989-93 :

1. Article V(1) : Neither of the two countries may develop, test and deploy space-based, air-based, sea-based and mobile land based ABM systems and components, whether or not they utilize "new technologies"; and probably,

---

19. John, New House, "Test" in Steven Anzovin (ed.), The Star Wars Debate (New York: H.W. Wilson & Co., 1986), pp. 181-182.

2. Article I(2) : Prohibits both parties from deploying an ABM system for defence of their territories, and providing a base for such a system.

3. Article VI(2) : Units deployment of large phased-array radars for early warning of strategic ballistic missiles: "to the locations along the periphery of its national territory";

4. Article IX: Prohibits deployment in, or transfer of ABM components to the third countries.

SDI also contains an implicit threat by U.S. to abrogate the Treaty in its entirety, if it decides to deploy strategic defences.[20]

According to the above clauses, to go ahead with the SDI programme would mean that either the treaty is scrapped or abrogated because it forbids putting devices into space that are supposed to destroy offensive missiles. SDI is built around the notion of using lasers and other "directed energy" weapons for just that purpose. All Europeans hope that ABM Treaty would be kept intact. They feel that any sizeable defensive system would have perverse effect of creating enormous spiral in offensive and nuclear arms - a situation that would be far less stable and secure.[21]

---

20. n.8, pp. 152-153.

21. n.5, pp.161-185.

In order to go ahead with SDI programme, there were attempts in the U.S. to redefine the limits, allowed under the ABM Treaty. This was opposed by Britain, in autumn 1985. In December 1985, the British Foreign Secretary, Sir Geoffrey Howe told the US representatives at a NATO ministerial meeting that ABM Treaty should be strengthened and clarified and SDI research should not be allowed to become an arms control stumbling block.[22]

Britain's support for and participation in SDI programme is based on a fire break, that is, between the unit of research and the ABM Treaty. If the United States crosses the limit, Britain would have to reconsider its support. However, the British officials do not know precisely where the firebreak would be and hope that the two Superpowers would negotiate its delimitation.

In June 1984, the French Ambassador to the Soviet Union observed the effects of the deployment of space-based systems. He said :

> "A situation in which each of the two main powers sought to render its territory completely invulnerable, that is, to escape all reprisals while at the same time being uncertain of success, would be full of dangers..."

---

22. The Times, 18 October 1985.

Hence he proposed an International Conference to discuss:

1. Anti-Satellite weapons restrictions in high orbit;
2. A ban on testing and development of direct energy weapons, for an initial period of five years;
3. Strengthening the registration and verification provisions of 14 June 1975 UN Convention on outer space objects. (23)

However, this conference did not materialise as it did not appeal to the Superpowers. Moreover, with the coming of a new Prime Minister Jacques Chirac, French view on the ABM Treaty had changed. He expressed the view that: "there was a need to respond to Soviet programmes, however the original vision of total elimination of nuclear weapons will never be realised. Modifications to the ABM Treaty might permit the partial deployment of defensive systems".[24]

Germany also indicated, by consistent emphasis in all official German statements, on the need to observe ABM Treaty, to negotiate with Soviet Union about space

---

23. John Frenske, "France and the SDI: Speeding in or putting the brakes?". International Affairs (London), Vol. 62, no.2, Spring 1986.

24. Ibid., p.241

based weapons (with the objective of banning them altogether) and to achieve a deep cut in offensive nuclear arsenals.[25]

The British and the French cherish the ABM Treaty because without it their own nuclear missiles would be deterred from reaching Russian cities. The Soviets in theory, could erect strong defences around their cities. There are about 162 French and British medium range weapons on British and French soil. Both the British and French fear all these would be ineffective, should the Soviet Union also develop ABM systems.

The ABM Treaty does not restrict research - whether at the governmental level or between the US and its allies. This would mean such a cooperative research programme would not be inconsistent with the Treaty. Nevertheless, there are indications that USSR would certainly object to a joint project of US and its allies for political reasons. When Articles V, IX and X are read together along with agreed statement G, the ABM Treaty prohibits cooperative efforts involving any transfers or assistance from USA to the allies at the point that research on ABM

---

25. Christopher Bluth, "SDI: The Challenge to West Germany", International Affairs, vol.62, no.2, Spring 1986, p. 254.

components moves to advanced development or testing. This would specially preclude the United States from providing technical descriptions and blue prints to its allies for advanced development of any type of ABM component. The Treaty also prohibits any joint engineering development or joint production of ABM components, even in cases where the US may legally pursue development and testing of programmes such as components of a fixed, land-based ABM system.[26] Thus, the whole SDI cooperative programme between US and its European allies appears to be under challenge by the Soviets in the context of ABM Treaty. The option appears to be either to change or abrogate the ABM Treaty. The Europeans have so far favoured the earlier option.

As the SDI programme assures protection against attacks by an ICBM, US advocates of SDI suggested that an anti-tactical missile (ATM) system could be deployed in Europe to assure protection against attacks by the Soviet intermediate, short-range ballistic missiles and cruise missiles. ATM system would strengthen NATO's theatre deterrent; would complicate Soviet attack planning; and increase the likelihood of timely, effective NATO response to any attack.

---

26. n. 8, p. 153.

However, the short flight times, and lower trajectories of these missiles would leave shorter warning and response times to execute interception. In addition ATM interceptors would have to rely on nuclear-armed interceptors, since non-nuclear kill (NNK) systems are not yet perfected.[27]

Even if an ATM system should prove to be technically feasible, more serious opposition to any deployment would remain. Any ATM system would utilize some components identical to or indistinguishable from those used in an ABM system. The transfer of such components by the United States to its allies would violate the ABM Treaty.European allies would also oppose any unilateral action which violates the ABM Treaty. Moreover, the Soviets might respond to an ATM system by deploying numerous and effective INF systems, thereby increasing the number of nuclear weapons directed at Western Europe. Alternatively, they might assign ICBMs or SLBMs to the theatre mission, forcing the ATM system to cope up with intercontinental as well as theatre systems.[28]

---

27. David S. Yost, "Ballistic Missile Defence and the Atlantic Alliance", International Security, vol.7, no.2, Fall 1982, p. 160.

28. Walter Goldstein (ed.),Fighting Allies: Tensions within the Atlantic Alliance (London: Brassey's Defence Pub., 1986), pp. 101-102.

**Deterrence**

The key to understanding European strategic concerns is and has been the effect of America's vulnerability to nuclear attack on the extension of deterrence to cover West European territory. In theory, American invulnerability to nuclear retaliation increased the credibility of extended deterrence because the US did not fear retaliation even if it used nuclear weapons first in an European conflict. By this logic, if deployment of SDI would lead to American invulnerability, then the credibility of extended deterrence would be enhanced. Bavarian Prime Minister Franz Josef Strauss observed that: "we are very much interested in the Americans achieving invulnerability through such a defence system because as a result, the credibility of their intercontinental missile deterrent would be even greater and more infallible than it is today".[29]

The credibility of extended deterrence would be enhanced only if the US deployed perfect strategic defences and does so unilaterally. However, the history of nuclear armaments points to the fact that new developments pursued by one side are soon matched by the other. Europeans

---

29. Interview with Franz Josef Strauss by Manfred Schell, Die Welt (Bonn), 27 March 1983, reprinted in FBIS (FRG), 29 March 1983, p.511.

fear that both the US and the USSR would become sanctuaries in war, while Europe remained vulnerable both to nuclear and conventional devastation. US deployment of its SDI programme would result in a situation where the U.S. would resort to nuclear weapons against the Soviet Union more willingly. However, an absence of Soviet response would be inconceivable, and if the US was indeed a sanctuary, then the substitute target for the Soviet Union could be Western Europe. West European countries would become nuclear hostages to the Soviet Union in a new and a more frightening sense, as they would be the preferred and only target of retaliation to a US blow against the Soviet Union. Rather than facing such a prospect, the Europeans preferred a situation in which both US and its allies are vulnerable in case of a nuclear war.

As Bernard D'Aboville, a French Foreign Ministry official has said, "making the world safe for conventional war is not at all appealing for Europeans".[30] Moreover, the European allies feel that the mutual deployment of perfect defences would increase the pressure on the allies for conventional force improvements at a time when the

---

30. Bernard D'Aboville, "European Attitudes towards SDI", Speech delivered in New York, 8 November 1984, French Embassy Transcript, p. 6.

financing of SDI would decrease US funds available for such forces. This would mean that the Allies would have to spend more money on their defences against the nuclear missiles. European strategists perceived that the research and development of US SDI programme would result in eventually Soviet ABM defence development, which would give the Soviets the advantage to attack Western Europe conventionally since it could protect itself against a nuclear attack, and ignore the US nuclear guarantee to Europe. In effect, the US strategic forces would be decoupled from the defence of Western Europe. If US responded by using theatre nuclear weapons to defend against the Soviet forces in Europe, then the central Europe would become a battlefield, unaffecting the Superpowers. Reliance on French and British SLBMs and US Euromissiles to threaten the Soviet homeland and deter the Soviet Union did not convince the Europeans since they believed that such forces are small and uncertain as deterrents and that they could never be a substitute for the US nuclear forces. The political dimension of the extended deterrence has been aptly described by a European strategist. He writes that: "The Western alliance is an alliance of equals. It's cohesion is therefore based on the greatest possible realization of the principles of equal risks, equal burdens and equal security. The present NATO strategy reflects

this principle. It guarantees that the American military potential with all its components, conventional, nuclear, is included in the defence of Europe ... The indivisibility of the security of the Alliance as a whole and of its territory creates the credibility of deterrence".[31] Europeans emphasize on the coupling of US and European nuclear forces, that is, in case of a war, US-central or strategic nuclear forces would be used against the Soviet Union. Coupling is also defined in terms of "shared risks" meaning that all members run the ultimate risk of nuclear devastation. Thus a unilateral attempt to shun this "responsibility towards shared risk" is viewed as a Western Europe's defence. Hence, Christoph Bertram notes that US nuclear guarantee to the defence of Europe, "becomes meaning-less, unless the United States is both vulnerable to nuclear attack and capable of adding its nuclear power to deter an attack on Europe. Europeans are convinced that their security rests on America's recognition of its own vulnerability. For Europeans, American-European solidarity is not just a matter of declared interests, but of shared fate ... West Europeans are convinced that the United States will remain vitally concerned about Europe only

---

31. Karl Kaiser, George Leber, Alois Mertes, Franz-Josef Schulze, "Nuclear weapons and the Preservation of Peace", Foreign Affairs, vol. 60, no. 5 (Summer, 1982), p. 1161.

if its own survival is at stake".[32]

The deployment of strategic defences has led Europeans to emphasise on the importance of shared risks and equal security within the Atlantic Alliance. This reflected a European concern that American invulnerability would lead US to return to an isolationist foreign policy, thereby building a "fortress of America".

To the British, an end to nuclear deterrence policy was impracticable and undesirable for the following reasons: (1) the concept of an impermeable shield which would destroy all ballistic missiles was considered to be unrealistic. (2) If both sides possessed BMD systems which they felt were impermeable, superpowers would still continue to increase offensive systems, in case there be a breakthrough by any one of them. (3) Western alliance would never be able to rely wholly on conventional forces even to deter a conventional Warsaw Pact attack, as the Soviet Union has superiority of conventional weapons over the West. Therefore, the

---

32. Christoph Bertram, "Strategic Defence and Western Alliance" Daedalus, vol. 114, no.3, Summer 1985, pp. 282-294.

West must be able to fall back on the threat of nuclear escalation.[33]

Germans have also expressed similar views on deterrence. The Federal Government did not accept the notion of deterrence through the threat of nuclear retaliation as it could become obsolete in the foreseeable future. On the contrary, they have emphasized that for the time being the doctrine of nuclear deterrence must continue as the foundation of the West European security.

Most Europeans were sceptical about NATO's ability to control or limit conflicts which involve nuclear weapons. The enhanced lethality of modern conventional weapons and the large number of nuclear weapons deployed in Europe have blurred the distinction between conventional, theatre-nuclear, and general nuclear war in European thinking. In all the three cases Europe would be devastated. For the Europeans, it is the possibility of escalation of a war especially an American commitment to use strategic nuclear weapons which poses a threat to the Soviet Union that forms the deterrent to Soviet/Warsaw Pact conventional

---

33. Trevor Taylor, "Britain's Response to the SDI:, International Affairs, vol. 62, no.2, Spring 1986, pp. 220-21.

or nuclear attacks. The coupling of American strategic weapons to the defence of Europe is central to the concept of deterrence. Hence, Europeans believed that the acquisition of enhanced theatre war fighting capabilities or deployment of systems could make prolonged conventional engagements more likely, weaken deterrence and make conflict in Europe more likely.

Continued American efforts to develop SDI had aggravated European fears concerning American commitment to the defence of Europe. An ATM system deployed by the US to protect NATO military assets and designed to enhance theatre deterrence has been seen by Europeans as an effort to decouple American strategic forces from the defence of Europe. In general, European reactions to an ongoing SDI are :

> It seems inevitable that no matter how strenuously the Pentagon argues that the new ABM (BMD), by safeguarding our retaliatory power, will increase our capacity to deter any attack against the West, many, if not most Europeans will believe instead that the US is increasing its capacity to ignore some future Soviet nuclear threat which European nations cannot escape".(34)

The Europeans questioned whether SDI could significantly reduce the vulnerability of American cities, given

---

34. Chayes, Abram, Jerome B. Wiesner (ed.) ABM: An Evaluation (New York: Harper and Row, 1969), p.179.

Soviet offensive counter-measures. Furthermore, they are concerned that these counter-measures are but the first step in an offensive arms race at higher and less stable levels. If a strategic defence system was deployed, most French defence experts would prefer it to protect ICBMs, rather than cities, thereby increasing the US capacity, if not its willingness to retaliate against a Soviet offensive strike.

Like the French, defence experts in FRG think that a leakproof shield was not feasible, particularly for West Europe. They were also concerned that an American area defence system would encourage Soviet offensive counter-measures that would undermine East-West stability. But unlike the French, they feared that SDI might create different zones of security, resulting in different levels of risk within the Atlantic Alliance. This development, they claimed, would undermine the Atlantic alliance rather than increase the credibility of extended deterrence. M. Woerner, Federal Minister of Defence, argued that should the US and Western Europe no longer share the same level of risk, then West European security would be decoupled from American security. Underlying this fear, was West Germany's perception that it was more exposed than the US to a Soviet threat. A strategic defence shield deployed by both the Superpowers would decouple US security from

European security, making the European theatre more prone to conventional and nuclear war. Even if Western Europe could be protected by an American umbrella, a conventional war could be waged in Europe by the Superpowers without the risk of nuclear escalation to either of them. This was especially worrisome to the West Germans, given the asymmetries between NATO and the Warsaw Pact conventional forces. Moreover, Egon Bahr expressed the view that through SDI, US would isolate itself both from the allies and its adversaries, building a Fortress of America and thereby undermine the basis of the security partnership between the U.S. and the Western Europe and between East and the West shared levels of vulnerability.

Although the French have doubts about the willingness of the U.S. to employ its nuclear forces on behalf of Western Europe, they and the West Germans believe that in the context of war, the U.S. would be better able to maintain flexible response. On the other hand, the Social Democrats in FRG argued that if the U.S. alone had point defence system protecting its military installations, the Soviet Union would accentuate its targeting of urban and military centres in Western Europe. A situation in which both Superpowers had point defences would not necessarily decouple Western Europe from the U.S. but it would tend to undermine the credibility of extended deterrence because

America's strategy of flexible response would be undermined. The U.S. would be forced to aim at unprotected targets with the risk of significant collateral damage to the Soviet Union. This, as with the strategy of Massive Retaliation, might be perceived by the Soviet Union as an incredible deterrent.[35]

**Nuclear deterrents of Britain and France**

Deployment of SDI would certainly result in expanded Soviet BMD capabilities. New Soviet deployments would reduce or negate the ability of both British and French nuclear weapons to penetrate their targets. Thus individuals in London and Paris have expressed concern that SDI may eventually cause these independent forces to "lose much of their validity". In order to overcome Soviet defence, British and French forces would have to be modernized. This would mean extra defence expenditure or cutting funds from conventional force improvement or social security projects.

Meanwhile, the British and French modernization programmes have been announced. During the mid-1990s,

---

35. Michael B. Froman, Anthony I. Gardner, et al., "Strategic Implications of SDI for France and West Germany", RUSI Journal, June 1987, p. 52.

British strategic forces will be substantially upgraded with the deployment of four Trident Submarines, each armed with sixteen D-5 SLBMs.[36] The deployment of the 64 D5 missiles will add over 500 hard target missile warheads to the British and NATO arsenals. French modernization plans include deployment of new land and sea-based forces. Deployment of the MIRVed M-4 SLBM on a new submarine began in 1985, and eighty M-4s are planned for deployment. Their longer range will allow French SLBMs to operate over larger areas and permit strikes against Moscow from the Norwegian sea. In the 1990s, both the M-5 MIRVed SLBM and the SX mobile IRBM are scheduled to enter service. The French strategic missile forces will have a total of 600 warheads by mid-1990s. Coupled with the full deployment of the D-5 by the British, Anglo-French strategic forces could add over 1000 warheads to allied nuclear arsenals.[37]

Even with the realization of these modernization programme, however, a major BMD effort by the Soviet Union would weaken French and British nuclear deterrence significantly. While most experts doubt that any BMD system could protect vital targets against a massive attack, such an attack would stretch the strategic capacity that the French and

---

36. Secretary of State for Defence, Statement on the Defence Estimates, Part I (London: Her Majesty's Stationary Office, 1984), p. 24.

37. Robbin F.Laird,"French Nuclear Forces in the 1980s and the 1990s", Comparative Strategy, Vol.4, no.4, April 1984, p. 398.

the British could mount, even with the expanded arsenals they are planning for the 1990s. It is true that given the number of warheads available to them, the Soviet Union could not hope for total immunity from the British or British strikes.[38] Yet if the Soviets were to embark upon an ambitious defence programme, the deterrent capability of both the countries would inevitably erode. For these reasons both the British and French have been less enthusiastic about eventual deployments.

The continuing viability of the independent nuclear forces has been raised by European leaders as an important issue concerning their attitudes towards the SDI. This is one of the main reasons why the French have been the most outspoken of all the European nations in their criticism of SDI. A strategic writer Marie-France Garaud observed:

> "To begin with since such a state of affairs would be sure to devalue the existing strategic nuclear armaments of the two countries, as well as those of France and Great Britain their quantities would have to be increased in order to maintain deterrence. One consequence of this would be that medium sized nations, already considerably overtaken in the technological race, would find it impossible to

---

38. Lawrence Freedman, "The Small Nuclear Powers", in Ashton B. Carter and D.N. Schwartz, Ballistic Missile Defence (Washington, D.C.: Brookings Institution, 1984), pp. 251-74.

> utilize the strategy of 'the weak deterring the strong', by means of nuclear weapons ... a gradual reversal to the strategic situation of the post-war years, in which Western European countries found themselves protected less and less by deterrence and more and more vulnerable to conventional attacks or short range weapons such as cruise missiles that are hard to intercept".(39)

## ARMS RACE, ARMS CONTROL AND EAST-WEST STABILITY

If past experiences are taken into account then there is no guarantee that in future both the Superpowers would end the deployment of strategic weapons. This would mean that in future there exists a prospect of much larger nuclear arsenal of Superpowers, both in terms of size and quality. Simultaneously, ongoing research and testing of BMD and ASAT weapons also threaten to generate a defensive arms race, and to expand the strategic competition into outer space. "Once defensive systems are in place, there would be continuing pressure to improve those systems in order to match improvements by the other side. There would be new motivations to increase the number of their offensive weapons in order to have a better chance of exhausting the defences".[40]

---

39. Marie-France Garaud, "Foreign Perspectives on the SDI" Daedalus, Vol. 114, no. 3, Summer 1985, p.311.

40. n.6, p. 46.

These arms races, both offensive and defensive would have numerable consequences for Europe. Increased US spending on strategic defences would compel Washington to decrease its military capabilities devoted to NATO contingencies and to pressurize the European allies to make offsetting increases in their defence budget. This would also require the improvement of British and the French nuclear forces in order to maintain their deterrent power.

Secondly, the United States seeks to achieve deep cuts in Soviet offensive forces, but is unwilling to use SDI as a "bargaining chip" to achieve reductions. It has been made clear by the US administration that SDI will be pursued no matter how the negotiations proceeded. Europeans fear that if success in the talks become contingent upon (Strategic, Intermediate and Conventional forces), it may be impossible to reach an agreement.

While FRG politicians sympathised with the Reagan Administrations' identification of the threat posed to the American deterrent, they advocated not a technological solution but a political one; arms control. The S.P.D. and liberal party advocated the use of SDI as a bargaining chip to be traded for significant reductions in Soviet heavy MIRVed ICBMs which threatened America's land based ICBMs

and in Soviet medium range weapons targeted against West Europe.[41] The SPD feared that SDI may not only precipitate a race in defensive systems but that some of those systems may have offensive uses as well. Similarly Hans-Dietrich Genscher, the liberal party Foreign Minister argued that SDI would be an obstacle to arms control, triggering a new arms race involving both offensive and defensive weapons.[42] The French, especially from the Socialist Party, also expressed concern that SDI would lead to higher and less stable levels of weapons.

ABM Treaty is regarded as a land mark of post-war arms control. The major reason why the treaty is overwhelmingly supported in European countries is that it symbolises the ability of the Superpowers to negotiate and compromise. It is valued less for its terms than for its role in making other negotiations in Europe on Security and Cooperation (CSCE) and conventional force reduction (MBFR) possible. If the treaty was changed or abrogated, then this would be a major set back for European security, as they define "security" in broader terms than defence. However, French

---

41. Bluth, SDI: The Challenge to West Germany, International Affairs, vol. 62, no.2, (Spring 1986), p. 256.

42. Ibid., p. 251.

remain sceptical about arms control while simultaneously maintaining a commitment to East-West dialogue and accommodation. The West Germans on the other hand are wedded for historical reasons to detente and demand progress in arms control negotiations as a tangible sign of its expansion. On the whole, Europeans feel that SDI research or a deployable system could have a damaging effect on European security to the degree it strains US-Soviet relations.

Europeans generally, and specially the British and the Germans believe that enhanced western security had to involve some cooperation with the Soviet Union and could not stem simply from the West's acquisition of enhanced technological capabilities. They had opposed an arms race in space, long back and British preference was that SDI should be negotiated away as part of an arms control package drastically reducing the number of offensive missiles.[43] Moreover, former Chancellor, Willy Brandt warned that "when an American SDI becomes a reality the Soviet Union will not reduce its nuclear arsenal by even one missile".[44]

---

43. Douglas Hurd's Speech: "Arms Control and Disarmament" to United Nations, no.10 (London: Arms Control Disarmament Research Unit of Foreign & Commonwealth Office, November 1981), pp. 10-13.

44. Wily Brandt, German Press Review, 30 May 1985, p.2.

In the year 1983, following the announcement of the SDI programme, the US began to deploy new intermediate range missiles in Europe. This was actually the implementation of December 1979 NATO Council "dual track decision: (a) to deploy 464 cruise missiles, 108 Pershing II missiles in five European States: Britain, West Germany, Netherlands, Italy and Denmark; (b) This deployment was to be postponed till December 1983 and the intervening period of two years was to be utilised for negotiating a Superpower arms control agreement, providing for simultaneous non-deployment of American missiles and a Soviet withdrawal of SS-20s from Europe. This decision process was the culmination of NATO's assessment of its threat perception that the SS-20s deployed by the Soviet Union (1975 onwards) had destabilised the European nuclear strategic balance and threatened the security of Europe.[45]

Between 1981-83 various arms control proposals were put forth by the US and the Soviet Union. In November 1981, President Reagan announced a "zero option" proposal providing for non-deployment of Cruise missiles and Pershing IIs in exchange for Soviet withdrawal of SS-20 missiles. At that time the Soviets rejected Reagan proposal and proposed for

---

45. James A. Thomson, "The LRTNF Decision: Evolution of US Theatre Nuclear Policy 1975-79", International Affairs (London), 1984.

the reduction and withdrawal of SS-20s to the level of what the Europeans had, that is, 162 British and French missiles. Britain, France and the US rejected the Soviet proposal and US upheld that the negotiations were for the reduction of Superpower intermediate nuclear forces and not of other nations.

Once the US announced the SDI programme, the Soviet Union which was opposed to the deployment of US intermediate range missiles in Europe, and rejected elimination of its SS-20 missiles, tried to link them with agreement on intermediate range missiles. Soviet Union also launched a propoganda war against the Reagan Administration on the grounds that US space-based missile system, in essence, was a space-based strike system. The Reagan Administration rejected the Soviet demand of linkage between an agreement on Intermediate range missiles and the SDI. In fact, President Reagan made it clear that SDI was a non-negotiable issue. Yet the Soviet leadership under Gorbachev, persuaded the matter of linkage at the two summits between Reagan and Gorbachev held in Geneva (November 1985) and Reykjavik (Oct. 1986).

The Soviet's continued insistence against SDI resulted in the failure of the Second Summit. Otherwise that Summit

had reached some understanding on the INF reduction. Both the leaders were keen to have some arms control agreement. Hence, while Gorbachev proposed the elimination of all nuclear weapons (in January 1987) by the end of the century, Reagan also expressed his view in favour of nuclear disarmament. It is this consideration, Reagan indicated, which led him to approve the SDI programme for rendering nuclear weapons impotent. Thus the two leaders expressed their belief in nuclear disarmament from their perception. But their dream could not be realised because of the long standing suspicions about each other's ulterior motives in a nuclear disarmed world. It was Gorbachev who broke the stalemate in February 1987 when he announced the delinking of INF and SDI issue.

In April 1987, during Shultz-Shevardnadze parley, Gorbachev proposed the global elimination of US and Soviet INF and short range missiles. Thus, he not only accepted Reagan's zero option but offered a "global double zero" plan. These proposals ultimately matured into an INF treaty signed by Gorbachev and Reagan on December 8, 1987 at the Washington Summit. The treaty provided for elimination of medium range and short range missiles of US and the Soviet Union. The US decided to scrap 396 Pershing IIs and Cruise missiles deployed in West Germany, Britain, Italy and Belgium

in the next three years. During the same period, Soviet Union would eliminate 683 missiles including SS-20s, SS-7s, SS-12 and SS-23 missiles and about 50 of which were deployed in East Germany and Czechoslovakia. In terms of numbers, the INF treaty eliminates hardly 4 per cent of the US-Soviet nuclear arsenal. The significance of the treaty was therefore not so much in numbers, but in the radical process of disarmament which was set in motion. The Treaty was a rejection of arms control approach which had until now been the foundation of a Soviet-American nuclear dialogue. The arms control approach meant a negotiated pursuit of the nuclear arms race. It implied a management of arms race rather than ending it. Thus INF treaty represented disarmament process of the nuclear arsenal.

A joint statement issued by the two sides in Washington instructed the Soviet-US negotiators to work out a ceiling on nuclear warheads and delivery systems. Indications are already there for reaching an agreement between the Super-powers in May 1988 (Moscow) on a ceiling of 6000 warheads - distributed over 1600 delivery systems. Thus the Washington Summit while making a notable progress in the process of Strategic arms reduction talks (START), skirted the tricky issue of Star Wars. The Joint Statement issued at the end of the Summit called upon the two negotiating teams "to

work out an agreement that would commit the two sides to observing the ABM Treaty, as signed in 1972, while conducting their research, development and testing as required, which are permitted by the ABM Treaty and not to withdraw from the ABM for a specified period of time". This of course, left the current position of the two sides on Star Wars intact.

The NATO Foreign Ministers endorsed the "double zero option" on 11-12 June 1987 in Reykjavik. Despite some remaining doubts, the last major obstacle to a formal consensus within the alliance had been removed in late May when the West German Chancellor Helmut Kohl dropped his objection to the inclusion of German Pershing-I As in the draft treaty.[46]

Allied leaders feared that the INF deal might lead to a complete denuclearization of Europe. In that event Moscow might exact a political advantage from its superiority, in conventional forces. "If the West thinks that the Soviet Union can attack Europe and succeed, then there will be an element of intimidation here and a risk of the

---

46. Defense and Foreign Affairs Daily, 11 June 1987.

West feeling, it is necessary to make accommodations with the East"[47], the NATO Commander General, John Galvin told the Newsweek, "West European Governments felt that zero option, or in the event of INF Treaty conclusion should be accompanied by compensatory measures. Compensatory measures suggested included :

1. Nuclear weapons not included in Geneva negotiations such as aircraft and sea-based missiles be improved and assigned to make up for the loss of the Pershing IIs and Cruise missiles.

2. To upgrade and replace NATO's battlefield nuclear weapons, such as artillery shells and short range missiles.

3. To build up NATO's conventional forces with new high technology weapons".[48]

The INF Treaty probably restores the European balance to status-quo-ante - the situation of 1979, that is balance

---

47. Russell Waton, R.B. Cullen et al., "At long last an Arms Deal", Newsweek, 28 September 1987, pp.18-19.

48. Daniel Charles, "NATO looks for Arms Control Loopholes", Bulletin of Atomic Scientists, Vol.43, no.7, September 1987, p.7.

of theatre nuclear forces. Indeed, INF agreement has not changed European dependence on the American nuclear guarantee. In fact it has increased European dependence on the U.S. Under INF Treaty there is the prospect of removal or elimination of nuclear arsenal, that is complete set of intermediate range nuclear forces. Hence in any future nuclear or conventional war, Europeans feared a devastation.

Europeans expect that U.S. Strategic deterrent would hold the ultimate balance of power. However, the Europeans fear that should the Soviets develop their own version of SDI, then the credibility of the U.S. nuclear guarantee in Europe would become uncertain. Thus, the SDI programme revitalised the doubts of Europeans as to whether the U.S. guarantee was truly creditable or not. Moreover, a possible Soviet Strategic defence system deployment could intensify the questioning of nuclear guarantee and stimulate a possible divisive debate within the NATO alliance.

## CHAPTER III

## SUPPORTIVE PARTICIPATION IN SDI PROGRAMME

The SDI programme had been presented as a vehicle for technological innovation also. While the West European Governments had questioned the strategic and political implications of SDI, they regarded SDI as a threat to the competitiveness of their industries and as a potential lure of their human and capital resources to the United States. The U.S. invitation to participate in SDI research and development opened up the possibility of a spread of the technological benefits. For the United States, it would serve to enlist political support of countries benefiting economically and discourage them from any blatant criticism of the programme.[1]

It was not until April 1984 that European Governments began to address the SDI issue. Moreover, with the re-election of President Reagan in November 1984, and the announcement of the U.S. Department of Defence's (DOD) plan to spend $ 26 billion on the SDI programme for the first five years, convinced the Europeans of the Administration's commitment to the project. As a result, the European Govern-

---

1. Michael B. Froman, Anthony L. Gardner et al., "Strategic Implications of the SDI for France and West Germany" RUSI Journal, June 1987, p. 53.

ments began to analyze the issue in greater depth and formulate their own positions.

The position of the NATO allies with regard to the SDI programme was important to the U.S. politically and to a lesser degree, technically. The US Administration needed allied support, for greater support of such a programme at home. Given the American position in most areas of high technology, it would seem that little European help would be needed. But if SDI research headed towards development and deployment of an extensive BMD system, European backing was essential. Moreover, the participation by Britain, France and Germany in the SDI programme would be considered important by the U.S. because of advanced European research in the areas of particle physics, electro-optics, and building of large and highly accurate space-based pointing systems which would be necessary for some space based weapons.[2]

Considering the above factors, the U.S. Defence Secretary on 26 March 1985 sent a letter to European nations inviting them to participate in the SDI programme. The

---

2. Michael Feazel,"European Leaders Expect International Participation in Defence Initiative", Aviation Week and Space Technology (New York), May 27, 1985, p.101

allies were not sure of the eventual goal of such a project and the nature of participation. As Lawrence Freedman remarked that, "the allies had not actually been asked whether they wanted this protection or felt that this was a sensible way for the U.S. to exploit its (U.S.) resources or even whether it was useful to set such an ambitious goal before there was any confidence that it could be achieved".[3] Still the participation became both tempting and imperative because of a realization by the Europeans that they were increasingly losing out in the technological race vis-a-vis the U.S. and Japan. However, the offer itself, was viewed by the Europeans as a deception. By stressing the economic and technological benefits of $26 billion for SDI research, the Reagan Administration was "paralyzing critical consideration of SDI". By extending the technological carrot to Europe, the Administration was able to stifle the political and strategic doubts the Europeans had and obtained positive support for the project itself. The economic benefits from the projects were not as inviting as the allocation amount, a mere $1 billion over five years was hardly impressive. The Dutch Defence Minister Job de Ruiter commented that "this $200 million per year divided among the NATO nations, Israel, Japan

---

3. Lawrence Freedman, NATO and the SDI: NATO Sixteen Nations, November 1984, p. 18.

and countless number of companies, including subsidiaries of the US enterprises will have minimal economic benefit for any country that decides to participate".[4]

Consequently, if the financial resources available proved marginal, the economic and technological benefits also have been exaggerated. The French Foreign Ministry study argued that since SDI was a military research project, its civilian technology spinoffs would not be necessarily substantial. It pointed out that U.S. leaders wanted Europe to participate in those areas where European competence was superior and not in lasers, micro-computing and space, where it was inferior. The latter areas would be of greatest benefit to European industry but prospects of such a cooperation appeared to be nil.[5]

The Europeans were also wary of the fact that the Administration's technology transfer policies relating to US-European technological cooperation were not encouraging in the recent years. The cooperation between the

---

4. Stephen J. Flanagun & Fen Osler Hampson, Securing Europe's Future in the chapter by Ivo H. Daalder and Lynn Page Whittaker, "SDI Implications for Europe: Strategy, Politics and Technology" (Dover: Auburn House Pub. Co. & Croom Helm, 1986), pp.51-52.

5. Daily Telegraph (London), 22 July 1985, p. 28.

U.S. and other NATO countries had been modest for various reasons. Foremost among them was the reluctance of the U.S. armed forces to accept foreign designs; economic protectionism; and more recently, U.S. restrictions on the transfer of militarily sensitive technologies to other countries. The participation in the SDI programme would benefit technological progress in Europe provided technology transfers were permitted, both between the U.S. and the participating countries and no restrictions were laid on taking a product for commercial development from SDI programme. Such favourable cooperation appears to be doubtful with the Reagan Administration strongly affirming to a policy of technology controls".[6]

At a press conference an American official said: "U.S. attitudes towards the transfer of technology has always been that it must be properly safeguarded so that it does not leak, and clearly with respect to sensitive technologies bearing on strategic defence, we would have to institute more than normal measures to assure that leakages would not occur".[7] The prospect of a truly equal

---

6. See, Richard Peter, "The Eastward Technology Flow: A Plan for Common Action", Strategic Review (Washington D.C.) Spring 1984.

7. Cited in Thomas Lefebure, Rapporteur Draft General Report of the Scientific and Technological Committee, North Atlantic Assembly, April 1985, p. 17.

and joint cooperation on SDI under such restrictive conditions was therefore highly unlikely.

Another fear of the Europeans was that, while they participated in the research programme on an American invitation, they would eventually be forced to share the burden of the cost of SDI project with the U.S. Thus the burden sharing controversy in the intra-alliance system would be repeated. Conversation between European leaders and a delegation of six U.S. Senators during the period of April 5-13, 1985 revealed that Europeans were concerned that "Nunn Amendment" philosophy would be enhanced by the SDI, particularly if they refused to endorse the programme (the Nunn Amendment was sponsored by Senator Sam Nunn, which required the allies to contribute more to NATO or face a reduction in U.S. contribution. It failed on the floor of the Senate in June 1984).[8]

Inspite of all above factors, European Governments decided to participate in the venture. On 6th December 1985 a government to government Memorandum of Understanding (MOU) was signed by the British Defence Minister Michael

---

8. Senator Larry Presseler, Star Wars: The Strategic Defence Initiative Debates in Congress (New York: Praeger, 1986), pp. 145-146.

Heseltine and the U.S. Defense Secretary, Casper Weinberger, concerning British participation in the SDI programme. The Federal Republic of Germany (FRG) signed an agreement on 27 March 1986 to allow West German industries to participate in the SDI programme and to share the results of the research in the field. However, unlike Britain, the FRG agreement was not a government to government MOU for participating in the SDI programme. Italy also signed an agreement with the US to participate in the programme in April 1986. Other members of the Alliance have explicitly declined to participate in the programme on government to government basis but have allowed their industrial establishments to participate in SDI related research. These allied States are: France, Denmark, Canada, Greece and Norway.

**SDI Contracts**

In case of Britain, British Defence Minister Michael Heseltine, who signed the Memorandum of Understanding named Kenneth Hambleton, Assistant Chief Scientific Advisor for projects and research at the Defence Ministry, to head the new SDI office established in the Ministry. This office was to be responsible for programme security, access to data and liaison with the U.S. SDI organisation. It was designed to speed up what one British official termed "an

abysmally slow process". However, the agreement provided no U.S. commitment to an approximate spending figure, and likewise of any overall programme for SDI work in Britain. Nevertheless, what had been positively announced about the agreement was its established rules under which British companies could bid for and possibly secure contracts from the SDIO. An office within the Ministry of Defence was set up to coordinate all such negotiations and to handle their security aspects. Eighteen technology areas were identified :

1. European Architecture study
2. Laser and Particle beam
3. Electromagnetic launchers
4. Ion sources
5. Optical computer
6. Advanced thratons
7. Electronic materials
8. Non-electronic materials
9. Sensors
10. Terminal radar
11. Terminal interceptor research
12. Laser/vibrometry/imaging
13. Counter measures
14. Software security
15. Phase conjugation
16. Battle management/command/control & communications
17. Signal processing
18. Space research[9]

---

9. House of Commons Defence Committee, Public Sessions on the SDI (HANSARD), December 1985.

Though Heseltine claimed to have made certain that one-way technology and personnel flows, from Britain to the U.S. would not occur, it was significant that two-sided ventures had been defined by British expertise. Seven technology areas were identified for two-way information exchange.

1. Command, control and communications ($C^3$) and battle management research.
2. Laser and optics
3. Advanced computing
4. Surveillance, target acquisition, identification and tracking
5. Non nuclear electro-magnetic pulse (EMP) and radio frequency (RF) weapon technology
6. Space technology
7. Special Materials[10]

Heseltine pointed out that the agreement would "safeguard British interests in relation to the ownership of intellectual property rights and technology transfer". He added that the agreement provided for consultative and review mechanisms. Under terms of the bilateral agreement, "there would be no inhibition preventing British industry from fully exploiting the research data developed

---

10. Ibid.

in British facilities, even though it was paid for, under contracts from the US Government."[11]

According to Dr. William Bardoe, "British industry wanted to take part in a coherent research program". He noted that while British industry was collaborating with other European companies, in a number of other research efforts like Eureka, and programmes developed under NATO's Independent European Programme Group, "the first step was to sort out the British-US relationship".[12] The British firms hoped to gain $ 1,500 million worth of SDI contracts, involving a major work for twenty British companies. However, a few weeks later such expectations were quashed by a Congressional ruling that there could be no "set-asides" of any sums within the SDI budget for the purpose of awarding contracts to the alliance bidders.[13]

---

11. "Britain Signs MOU to Participate in SDI", Aviation Week and Space Technology, December 16, 1985, p.12.

12. David A. Brown, European Industry Begins to Seek U.S. SDI Contracts, Aviation Week and Space Technology, December 16, 1985, p. 12.

13. Financial Times (London), 25th October 1985.

Before the MOU was signed, British Government was vexed by the lack of high technology contracts for the British companies in the proposed new Ballistic Missile Early Warning Systems (BMEWS) construction at Fylingdales moor. Their chargin was compounded when U.S. purchased French RITA communications systems instead of the British Ptarmigan. Subsequently, agreement led to considerable disquiet within the British scientific circles. There was much scepticism on the technical feasibility question from experts in computing. When George Bush had visited London in July 1985, 78 computer scientists from British University departments presented a petition against SDI which dwelt largely on what they saw as major obstacles in computing terms to its technical feasibility".[14]

On the other hand, participation in the SDI programme represented twin goals of maintaining present profitability, while sustaining the drive towards technologies to fuel future growth for the British industry. Initially the Ministry of Defence called for a united approach by the industry that is, formation of SDI club, but the companies were persuaded to supress their competitive

---

14. Christopher Meredith, Space Weapons: Deterrence or Delusion? (Cambridge, Polity Press, 1986), p.253, 345.

zeal in order to promote a united British front. Until recently Ministry of Defence was seeking the keenest prices and best responses from the industry, but due to less number of contracts and less money involved, competition involving a unified front had started cracking.[15] European Architecture study has $ 6.5 million of cash which had to be spread over twenty two months among sixteen companies. Hence the companies were looking for alternative routes to SDI. Apart from the few exceptions such as rail gun and Culhams labs' Ion sources which was awarded a large contract for $ 7 million for five years; two $ 142,000 contracts awarded for optical computing teams at Ferranti and Heriot Watt University; and $ 7 million awarded to Rutherford Appleton Laboratory for research on ultraviolet excimer 'Sprite' laser etc.[16] The main openings for the companies and research institutions lay through the innovative Science and Technology Office (ISTO). ISTO remitted funds for small contracts. If the British companies wanted larger contracts, they would have to act as subcontractors to a US company. Encouragement was given by the SDIO to US companies to team up with Europeans because they could gain both technical competence that

---

15. "SDI and British Industry", Armed Forces Journal (Washington D.C.) vol.5, no.9, September 1986, pp. 418-420.

16. n.13, p. 254.

Europeans might have in a number of areas; the political perspective and seal of approval necessary to permit an eventual implementation of SDI concept; and risk of losing the competitive edge. On the other hand, it stressed British lack of self-confidence in industrial ability and the teaming arrangements of companies. In effect, this meant that the role of the governments was to pave the way for industry by negotiating the necessary market intelligence, security and intellectual proprietary rights and to let industry get on with the job. British industry's task was to compete effectively in SDI research programme and work efficiently. Apart from the major identified obstacles, there was also the danger that major components of the programme could be cancelled in the uncertain years ahead. Hence a section of industries and scientists felt that it may not be practicable to put all its eggs in the SDI basket.[17]

**Federal Republic of Germany**

The British agreement was not just important in itself, but even more so, as a model, assisted the US Administration to achieve a favourable outcome in the

---

17. n. 14, p. 421.

UK SDI Contracts

| SL. No. | Companies | Project | Duration (years) | Amount in dollars |
|---|---|---|---|---|
| 1. | Ferranti | Optical Computing | 1 | 0,142,500 |
| 2. | General Electric | Concept Definition | 1 | 0,100,000 |
| 3. | General Electric | KEWS | 1 | 0,100,000 |
| 4. | Heriot Watt University | Optical Computing | 1 | 0,142,500 |
| 5. | UK Atomic Energy Authority | Neutron particle beam | 5 | 10,000,000 |
| 6. | Software Sciences | Sensor Acquisition tracking and kill | | 4,000,000 |
| 7. | Royal Signals & Radar Establishment (Ferranti, Plessey, Marconi) | Laser techniques | | 4,000,000 |

By 28th September 1987 contracts worth $ 44 million had been signed with British establishments.

Source: Nature, 3 April 1986, Financial Times (London), September 28, 1987. (New Jersey)

negotiations with West Germany. However, it would be wrong to conclude that there was no opposition to FRG participation in US SDI projects. The opposition in FRG had come not only from the scientists but also from some major German companies like Bosch, Leitz and Siemens. Others such as Dornier and Messerschmitt-Bolkow-Blohm, expressed an interest, initially with the proviso that a government-to-government agreement would be needed to protect their rights within such arrangements. By the end of 1985, these companies teamed up with major U.S.Corporations without waiting for any participation agreement, in bids for $ 10 million contract for an infra-red telescope experiment scheduled for a shuttle flight in 1987. The contract likely to be awarded to either of the companies, was postponed following the American space shuttle disaster in January 1987.[18]

The delay in signing US-FRG agreement could be a result of different opinions of the different political parties. The Christian Democratic Union (CDU) and the Christian Socialist Union (CSU) refused to accept SDI as a new strategic doctrine, but urged West German firms to participate in its research. The liberal party (FDP) rejected SDI as a strategic concept and feared that it would undermine East-West arms control agreements, but conceded that

---

18. n.13, pp. 254-255.

there might be benefits derived from West German participation in the research. Social Democratic Party (SDP) completely rejected SDI's strategic objectives and criticised German participation in the programme. The West German Chancellor Helmut Kohl refused to endorse SDI as a strategic concept but offered its political support in the form of an MOU and encouraged West German defence contractors to bid for SDI work. The government hoped that participation in SDI research would be beneficial in general, technological terms and in specific defence related fields against the Soviet offensive weapons. Both France and FRG were concerned about the technological challenge presented by the SDI. Defence analysts and experts in high technology research believed that more active participation in SDI research would be essential if their countries were to financially and technically, cope up with the military ramifications of the SDI. "Both countries were also interested in possible spin-offs of the programme in the areas of advances in electronics, telecommunications, software, high speed computers and artificial intelligence".[19] All these considerations influenced FRG for participation in SDI.

---

19. John Fenske, "France and the SDI: Speeding Up or Putting on the Brakes?" International Affairs, vol.62, no. 2 (Spring, 1986), p. 235.

On 27 March 1986, two agreements were signed by FRG Economics Minister Martin Bangemann and US Defence Secretary Casper Weinberger: (1) MOU clearing the way for FRG industry and research establishments to participate in the SDI; (2) Joint understanding of "principle" aims to encourage technological cooperation and to create safeguards for secure transfer of technology. FRG administration was not directly involved in research and funding of the contracts.[20] The Federal Ministry of Defence and the Chancellor's office insisted on Article IX of the MOU that "in recognition of their common security interests and to facilitate the effective realisation of these agreements, FRG-US would carry out a mutual exchange of information in areas of SDI research agreed by both sides". Beyond this agreement, they were to exchange technology in areas of SDI research which would help the West Germans to improve their conventional defence, especially air defence.[21]

There are two basic differences between Britain and FRG agreements signed with the US on SDI projects. According

---

20. "Germany Joins SDI Programme", Flight International, (England), 12 April 1986, p. 12.

21. Michael B. Froman, Anthony L. Gardner et al., "Strategic Implications of SDI for France and West Germany", RUSI Journal, June 1987, p. 51.

to Pentagon officials, Britain had signed guarantees, the details of which were being kept secret, which would later secure patents, intellectual and proprietory rights for British technology. On the other hand, FRG had won the right to exploit independently those technologies, which its firms developed for the SDI programme.[22] This was the basic difference between British contracts and the German contracts. By 25th June 1987, FRG had procured $48.2 million worth contracts against British $ 34 million worth contracts. Britain's poor performance was attributed to the intrinsic difficulties these companies faced, trying to penetrate the American defence market.[23] The largest contract in FRG was worth $ 28 million given to Messerchmitt-Bolkow Blohm in the area of space based Infrared Background Signature Survey Experiment (IBSS).

**France**

Critics who argued that SDI would divide the Atlantic Alliance cite the French Government's opposition as evidence. It is noteworthy that the French are against US SDI but not against French national anti-missile system. Indeed,

---

22. n.20, p. 12.

23. New Scientist (London), 25 June 1987, p.

the Socialist Party (PS), the Gaullists and the key members of the defence establishment favoured a national anti-missile system to defend France's military installations. While a space-based area defence for U.S. cities was opposed as weakening deterrence, a point defence for America's ICBMs was seen as enhancing it. However, the Rassemblement pour la Re'pulique (RPR) of Prime Minister Chirac believed that there should be active French participation in SDI research to acquire technology for a European ballistic missile defence capability. The French Government under President Francois Mitterand refused to endorse SDI as a strategic concept or to give political support to the U.S. in the form of a MOU. However, it permitted French defence firms to bid for SDI contracts because of the concern that there was a growing technological gap between the US and France.[24]

Therefore, militarily, France pursued research parallel to that of the U.S. and Soviet Union on space based weapons and ways to counter them. Secondly, the French believed that defence against bombers, cruise missiles and non-ballistic SS-21s, SS-22s and SS-23s must be improved, even if it required the revision of the ABM Treaty of 1972. After the signing of the INF Treaty in December 1987, however, the latter became irrelevant.

---

24. n.21, p. 51.

Economically, France was aware of the limited gains from SDI. French companies did not expect to receive a large share of SDI work. In fact, only a few contracts had been signed so far on the continent. They believed that the strict U.S. regulations limiting technology transfer and the pressure upon the Congress to spend US dollars in America would have prevented them from reaping significant financial benefits. SDI was attractive for them because of the new fields of research involved: even small contracts involving cooperation with U.S. firms would yield valuable technological advances.

Technologically, the French Government was concerned about the challenge presented by SDI. Defence analysts and experts in high technology research believed that more active participation in SDI research would be essential, if 'France' had to financially and technically keep up with the military ramifications of the SDI. The French were interested in the possible spin-offs for the civilian sector of their economy, especially advanced in electronics, telecommunications, and software.[25]

The official French 'No" to the SDI was belied by the industrial 'Yes'. Initially, the French aerospace and

---

25. Michael Froman, Anthony Gardner et al., France and SDI, The Army Quarterly and Defense Journal (England), vol. 117, no.3, 1987, p. 302.

defence electronics companies had shown reticence towards SDI but later, they were trying to make up for the lost time - by mounting bids and winning research contracts. Thus consensus was emerging between the French Government and industry that SDI involvement would be beneficial. Although the monetary benefits were very less and the number of contracts remained small, the following French companies pursued their interest in SDI research :

1. Thomson-Matra in defence electronics
2. Aerospatiale, Sesa, Cap Gemini, Sogeti in computer software.

Thomson and Matra believed that European companies had twenty-five years of lead over the Americans in integrating computerised system for aerial defence. These vital technologies for detection, tracking and guidance systems were planned to be incorporated in Star Wars. SDI might have offered solutions to the anti-tactical missile defensive screen which France was interested in developing with West Germany. SDI was a way of combining U.S. and European interests.[26]

The French Government's Delegation generale pour l' Armament (DGA), an armament agency, sent a high level

---

26. David Marsh, "French join Star Wars Scramble", Financial Times (London), 19 March 1987.

delegation to the U.S. to discuss France's potential role in SDI programme.[27] The visit signalled increasing official interest in SDI. Chirac claimed that France could not afford to be left out in SDI research with the concommitant risk of being left on the sidelines of technological progress.

The executives of France's nationalized aerospace company, Aerospatiale met in April 1986 with SDIO and US Army Strategic Defence Command officials. Discussions focussed on the European anti-tactical ballistic missile programme and the potential role for an Aerospatiale weapon system in an ATBM segment of SDI. The French ATBM system would be directed at protecting France's strategic nuclear arsenal from Soviet IRBMs based in Eastern Europe.[28] Aerospatiale in a joint venture with the French electronics firm Thomson-CSF and a US company was selected as one of the seven industrial teams to participate in the architecture study of the ATBM programme.[29]

The Executives of France's leading defence contractors did not believe that President Mitterand's refusal to sign

---

27. French Signals, Aviation Week and Space Technology, 3 November 1986, p. 31.

28. For discussions with SDIO ON ATBMs Defense Electronics (Palo CA), June 1986.

29. France and SDI, SIPRI Yearbook 1987, p. 33.

a MOU with the US Government would have impaired their ability vis-a-vis British, German and Italian companies to compete for contracts. They were confident that they would produce better and cheaper goods at a quicker pace than their European competitors. According to M. Francois Heisbourg, Vice President of Thomson International, "Chancellor Kohl's Government may have given away a valuable bargaining lever by endorsing the SDI before negotiating the most favourable terms of its MOU with the U.S. Governement. As a result, the FRG industry was tied hand and foot to the Americans because the U.S. Government had the right to determine which technologies were too sensitive to be transferred as long as disputes over classification persisted. West Germany had obliged itself to support SDI with no guarantee of receiving any new technologies in exchange for its endorsement. To overcome the American predominance and arbitration of technological transfers and to retain national independence, President Mitterand launched the EUREKA project (European Research Coordination Agency), a European high technology programme with primary focus on civilian applications. This programme was also launched to counter the growing concern that SDI might rob France of its best research scientists and Pentagon might treat French firms as sub-contractors. Cohabitation had little impact on France's critical policy towards the SDI.[30]

---

30. n.28, pp. 302-303.

**Italy**

Speaking to a joint session of the U.S. Congress, Italian Prime Minister Bettino Craxi stated on 6 March 1985, that Italians "view with interest the research programme for the Strategic Defence Initiative announced by President Reagan. Such a programme appeared to them as completely compatible with the existence of the ABM Treaty....'[32] Over sixty Italian SDI research proposals had since been offered for US consideration, and US and Italian officials continued to consult on a formal agreement. Italian industry had been among the most active in Europe, in soliciting SDI contracts, despite the lack of a formal government to government agreement between the US and Italy.

Governmental action had been repeatedly delayed because of a series of political crises in Rome, including the collapse of Prime Minister Bettino Craxi's Government in 1985. Bettino Craxi, whose coalition returned to power subsequently virtually unchanged, declared that he supported participation, but at the governmental level there had been no formal agreements.

Augusta, the large Italian helicopter and aircraft manufacturers, was heading a special consortium set up to

---

31. Senator Larry Pressler, Star Wars: The SDI Debates in Congress (New York: Praeger,1986),pp.152-153.

bid for SDI contracts. The Italian Consortium for Strategic Technologies (CITES) included eight important Italian aerospace and electronics firms. The only exception was Aeritalia Company which was bidding separately for SDI contracts.

CITES goal was to be a major Italian partner in both Strategic Defence Initiative and Eureka programme. Franco Bardelli, consortium president said that the consortium would conduct research in very high speed computer software, electro-optics and lasers, infrared applications and the new generation electronic components, to list a few.[32]

Finally, Italy also concluded a 'Memorandum of Understanding' with the US in April 1986. CITES managed to get contracts in the European Architectural study and the Eureka programme like the other European nations. Italy opted for participation in SDI programme to get some contracts which would help them to bridge the technological gap to a certain extent. By November 1987, Italy had got thirteen SDI contracts worth $ 5 million.[33]

---

32. David A. Brown, "European Industry Begins to Seek US SDI Contracts", Aviation Week and Space Technology December 16, 1985, p. 14.

33. Defense Daily (Washington D.C.) vol.155, no.8, 12 November 1987, p. 70.

**One Sided Bargain**

STATUS OF ALLIED CONTRACTS

| Country | No. of contracts | Value in million dollars |
|---|---|---|
| Federal Republic of Germany | 19 | 45.9 |
| United Kingdom | 24+ | 48.2 |
| Italy | 13 | 05.0 |
| France | 4 | 03.4 |

Total value of Allied Contracts: $ 102.5 million

Sources: Defence Daily, vol. 155, no.8, 12 November 1987, p. 70.
Nature, 3 April 1986.
Financial Times, 28 September 1987.

The table would indicate that the European States have just managed to get little over $ 1 billion of SDI contracts out of an announced SDI budget of $ 26 billion. Certainly, the Europeans are disappointed over the tiny silver of SDI money that had crossed the Atlantic. Other disillusionment included the cumbersome DOD, bureaucracy and long standing restrictions on technology transfer. More than half of the contractors had lost faith that they would

ever see a substantial amount of money from the SDI and they had stopped trying to develop long term proposals for Star Wars related projects. In addition, many European companies interested in SDI work discovered that they lacked the experience and systems engineering skills to compete with the grants of US defence research.

Most European contracts had involved small scale projects, mostly of a theoretical nature rather than big hardware contracts. The studies had encompassed areas such as European SDI "architecture", which focussed on, how an SDI shield for US could be extended to cover Europe. According to observers, these studies were not likely to lead to large hardware contracts, but US would gather the most appealing ideas and contract them out to American industry.

Furthermore, the Europeans experienced that a more hopeful route of joint projects with U.S. concerns were not in the ultimate analysis beneficial to European industries. For example, SDI had awarded seven contracts each worth $2 million for various consortia to look at European missile defence. Four of the consortia were headed by American firms: LTV, Hughes Aircraft, Lockheed and RCA. The leaders of the rest were Europeans - Messerschmitt-Bolkow-Blohm (FRG), SNIA (Italy) and a joint venture between Thomson and Aerospatiale (France). These programmes were limited to

theoretical studies and that they were not likely to proceed towards hardware development in Europe.[34]

A former State Department official described the U.S. solicitation of European participation in SDI research programme as a "combination of beating (the Europeans) over the head with a stick while waving a carrot". It was to mollify European fears of a Fortress of America that President Reagan's early SDI study panels floated the idea of providing the allies with a missile defence system, to protect Western Europe against incoming Soviet missiles. This plan was soon dubbed as EDI and it was through EDI that the Pentagon tried to get Europeans support for SDI, commented Martin McCusker, Director of the Military Committee of North Atlantic Assembly.

The carrot and stick approach worked at least temporarily as Britain, FRG and Italy had signed MOUs. All these Memorandums of Understanding set forth procedures for industrial cooperation and new controls over the exchange of classfied information and listed technologies that might be provided by foreign contractors to the SDI effort. They contained no guarantees of funds for the overseas contractors. Moreover, the Reagan Administration also violated the promises that

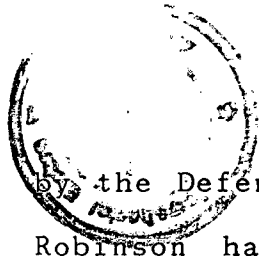
---

34. Peter Marsh, "SDI: After High Hopes, Europe Getting R&D Crumbs", Science and Government Report (London), June 1987, p. 18.

had induced the Europeans to support the programme. In December 1986, President Reagan began to push for a broader interpretation of the ABM Treaty to allow for wide ranging SDI tests, despite unanimous opposition of NATO member countries. Weinberger did not consult the allies before announcing, in February 1987, that certain elements of SDI were being accelerated past the research stage to ensure early deployment and despite Abrahamson's flowery proclamations of US European cooperation, his organisation had done little to protect European interests in the competition for Star Wars contracts.

Initially, Europeans hoped to gain at least 15 per cent of the total $ 26 billion proposal for SDI between 1985-1989. The budget had been scaled down to $ 18 billion and the Federation of American Scientists estimated that European contractors would be running for 1 per cent of the total. European firms had lost some of their interest in SDI as a result of the substantial reductions in the type and value of the research. The European officials feared that there might be a hidden agenda, using the project as a vehicle for raids on European technology, by a U.S. defence establishment that had lost its competitive edge.

Three months after the British MOU had been signed there were revelations of an attempted raid on British secrets



by the Defence Department consultant named Clarence Robinson. Robinson had tried without Ministry of Defence's approval to use his ties with Richard Perle's Office of Security, to obtain the detailed plans of some of Britain's most sensitive defence projects, with the intention of adding them to the Pentagon's Militarily critical technologies list. Some European officials feared that the list of things like computers and software that were banned from the US to harass western countries, would be continued with special focus on western countries that had developed new high technology industries. Melvin Laird and Bobby Inaman harshly criticised the effect of new US export control policies. The team reported that the MOU on SDI had prompted European concerns that "not only are they impeded in gaining access to the technology that would help Europe compete with the US and Japan but they are also hampered in their commercial applications of the technology."

Stanley Orman and other European advocates of SDI admitted that aside from EDI feasibility studies, which amountedfrom $ 25 million to $ 30 million, the only contracts likely to come Europe's way are through teaming arrangements, with American contractors. Under those arrangements, the primary contractor retained all rights to the final product and to any civilian spin-offs or what one British IBM executive called drip-offs. Even in the event of a genuine European-

US partnership said Gly Ford, much of the technology arising from SDI would be likely to end up classified and unavailable for civilian protection.

The deal struck over SDI was one-sided bargain - leaving European enthusiasts scrambling for a wind fall that refused to materialise and a project that their own governments found more of a threat than a guarantee of security. At a time when the economic rules of the US-European relationship were changing fast, the episode raised fundamental questions about the reliability of American leadership and Washington's willingness to tolerate European independence. McCusker of the NATO assembly believed that the sour experience of SDI had been a vital factor in spurring the Europeans to break with traditional US dominance and develop defence strategies of their own. With the Reagan-Gorbachev INF agreement, which undermined the basic premise of European support for the SDI, the distance across the Atlantic seemed only to have widened.[35]

In conclusion, it can be seen from the above evaluation that there was a lesser chance of Europe being able to bridge

---

35. Mark Schapiro, The Selling of Star Wars to Europe, New Statesman (London) 22 January 1988, vol.115, no. 2965, pp. 18-20.

the technological gap and compete with US by participating in the SDI programme. On the other hand, a move by the US Senator to severely limit foreign firms and government laboratories from participating in research for SDI programme had set a stage for a bitter outcry from allies. The Senate adopted the Glenn amendment which would bar most of work by foreign governments and foreign firms on US funded RDT&E in support of the SDI unless they do the work more cheaply. The Senate softened the prohibition by providing an exemption for foreign governments and foreign firms that agreed "to fund a substantial portion of the total contract cost". The exemption amendment was authored by Senator Sam Nunn. This amendment did not apply to contracts entered into previously or retrospectively. Nunn who had been in the forefront of increasing US allied defence cooperation noted that the US had tried to get cooperation for a long time, but it "required good faith and equal competition". This amendment required that any European country that wanted to participate in the SDI would have to put a portion of its own money in one of the SDI projects. The government or a company which did that would be able to compete on an equal plane. The reason given for this amendment was that the SDI contracts had been awarded on a "political basis for support around the globe rather than strictly on the basis of merit".[36]

---

36. "US Senate Bars Allies from most SDI Participation" Strategic Digest (New Delhi), vol.XVII, no. 11, November 1987, p. 2216.

Thus, the US was proceeding in the direction of promoting European participation in the SDI programme provided, they also made financial contributions. There are also clear indications that technological transfers are selective. This was not the original plan of cooperation when Europeans were sought by the US for participation in the SDI research programme. The US policy statements had indicated that there would be both financial and technology flow from the U.S. to Europe. To prevent any further hostage to American unilateralism, the Europeans have initiated high-tech research programmes under exclusive European organisation such as EUREKA, EDI and EEC. Eureka has been seen by many as an alternative to the SDI.

## CHAPTER IV

## TOWARDS A PARALLEL SDI PROGRAMME: EUREKA

The SDI represented a challege to Europe on two levels: (1) technological; and (2) military. The dramatic increase in US funding for key technologies such as high energy physics, computer software, optics etc., threatened to increase America's technological lead with disturbing consequences not only for Europe's defence industries, but for the competitiveness of European civilian high technology areas as well.[1]

To meet and reduce enormity of the SDI programme's technological challenge the French Government on 18 April 1985, proposed a cooperative project called 'Eureka' (or European Research Coordination Agency). The aim of Eureka was to coordinate research and development efforts in the areas of :

1. Robotics;
2. Information processing;
3. Telecommunications;

---

1. 'SDI and Eureka' in the Chapter on "Western Europe: Looking Beyond INF", Strategic Survey (London) 1985-86, p. 87.

4. New Materials; and

5. Bio-technology

at the European level.

The former French Defence Minister, Ronald Dumas said: "Eureka project is primarily civilian in spirit". This project provided for a joint engagement of all West European countries carrying out "third technological revolution" including the development of media to be used in outer space. President Mitterand said that the basic aim of Eureka was to ensure Europe's technological independence in "vitally important fields.[2] However, a closer study of this programme suggested that it had some important elements common to the SDI efforts. These were: artificial intelligence, fifth generation computers, sensors and space and technologies. Thus Eureka programme had military implications also. It has been observed that: "SDI is a military programme which might have civilian implications but Eureka is basically a civilian programme which might have military implications".

**Factors that lead to the Eureka Programme**

Eureka was the result of the Eurocrats' persuasive diplomacy, which converted national politicians to the one

---

2. Colonel Manojlo Babic, "Project Eureka", Review of International Affairs (Yugoslavia), vol.36(851), September 20, 1985, p. 20.

sector collaboration endeavour. Michael Carpentier pressed, not only for the collaboration route and Information Technology but also insisted on high priority of cutting edge technologies in their national budgets and contributions to the European Commission. Eurocrats argued that as Western Europe was emerging from its decade long recession and stagflation in 1983-84, it should contemplate committing money to more rapid and integrated technological development. According to President Mitterand, there were a multitude of problems faced by the Europeans, "particularly the complex legal, linguistic and financial compartmentalization and separateness". He noted that the present system based on nationalism with all the rigid procurement policies, market production and diverse national technical standards had to be changed. He points out that the "most salient character of the proposal (EUREKA) concerned a market oriented Research and Development (R&D) strategy that would accelerate efforts for unified industrial standards, loosen up public procurement and eliminate trade obstacles".[3]

Secondly, "Eureka was a vehicle to counter SDI". France perceived SDI as a potential threat not only to its policy of independent nuclear deterrence but also to the competitiveness of the high technology industries in Western

---

3. Pierre Henri Laurent, "Eureka or the Technological Renaissance of Europe" , Washington Quarterly (Cambridge M.A.). Winter 1987, p. 59.

Europe. The fear that European industrial brain power and energies would be siphoned off by engagement in the massively financed SDI programme and Pentagon might treat French firms as sub-contractors rather than equal partners, drove the French to resist by devising a counter idea. The same fear forecasted civilian technological spin-offs from SDI that would enlarge the "technological gap to Europe's detriment".[4]

Lastly, the Eureka cause was greatly promoted, following the barrier to European participation in SDI which increased substantially (during 1985-86) and Europe became more and more wary about the size and number of US contracts. Out of $ 26 billion of the original amount only $ 7 million in funds were actually committed to Europe by June 1986. The US counterparts, however, had $ 8.5 billion worth contracts. Europeans were initially expecting 10 per cent of the total or $ 3 billion but the current estimate was that they would only receive 1 per cent of the total.[5] All these facts strengthen European belief that Europe's part in the SDI would be of a secondary sub-contractor and

---

4. Konrad Seitz, "SDI: The Technological Challenge for Europe", The World Today (London), August-September 1985, p. 18.

5. Elizabeth Skons, "The SDI Programme and International Research Cooperation", SIPRI Year Book, 1986, p. 290.

that the original lure of a greater share of the budgetary outlay of SDI programme was a mirage and doubtful in future.

**Eureka Programme**

Eureka was established by a conference of ministers and members of the Commission of the European communities in Paris on 17 July 1985. It entered its realisation phase with the second Eureka Ministerial Conference in Hannover on 5 and 6 November 1985. Nineteen European nations participated in the initiative. They included Germany (FRG), France, Austria, Iceland, Finland, Norway, Sweden, Turkey, Switzerland, Italy, United Kingdom, Spain, Portugal, Denmark, Netherlands, Belgium, Luxembourg, Greece and Iceland. The second Eureka Communique declared: "The aim of Eureka is to raise, through closer cooperation among enterprises and research institutes in the field of advanced technologies, the productivity and competitiveness of Europe's industries and national economies on the world market, and hence strengthen the basis for lasting prosperity and employment. Eureka will enable Europe to master exploit and build up technologies for the future, in crucial areas. This will be achieved by encouraging and facilitating increased industrial, technological and scientific cooperation on projects directed at developing products, processes and services which have a world-wide market potential, and based on

advanced technologies.[6]

It was envisaged that the funds for the research programme would come from government, industrial and banking sources, possibly including EC funds. France committed itself to a sum of 1 billion French Francs ($ 116 million) for 1986 and Netherlands promised an annual sum of $8.5 million. The British Government offered $ 360 million and the Federal Republic of Germany committed $ 450 million in 1986 and planned to invest upto $ 4.5 thousand million within the following six years.[7] However, these amounts were hardly comparable to the US SDI budget of $ 2.7 billion for the year 1986.

In the Second Eureka Conference, ten Eureka projects were approved. At present the number of Eureka projects which have been approved is 165, with a budget of $ 4.5 billion.[8] The principal aim of Eureka was to coordinate European research and development efforts in these high technology areas:—

---

6. Communique of the Second EUREKA Ministerial Conference in Hannover on 5 and 6 November 1985, European Report (Hannover), November 9, 1985, no.1174, p. 1.

7. Bhupendra Jasani (ed.), Space Weapons and International Security (Oxford:Oxford University Press, 1987),p.49.

8. Europeans approve more Eureka projects, Aviation Week and Space Technology, October 5, 1987, p.12.

Euromatic research included the development of large digital computers to carry out simulations required in the design of complex systems (including nuclear weapons). High parallel computers with greater capacities and synchronous multiprocessors for digital analysis, signal and image processing are also under this programme. It was proposed that a European Software Design Centre be established to coordinate work on research and development, data transfer and information technology. Another area under this programme was the development of artificial intelligence system with symbol processors for applications in aviation and aeronautics. With a logical inference capability, computers learnt and remembered from an operation, and used that information in the next operation with improved results.

Eurobot research consisted of three sub-programmes in third generation robotics, automated factories and lasers. There were four types of lasers that are identified: $CO_2$, CO, excimer and free electron lasers. The aim was to develop high efficiency, high power lasers with high penetration and for high collimation capabilities. Dornier Company in Federal Republic of Germany had proposed construction of an FEL under the Eureka programme.

Eurocom research would create computerized information networks linking research groups by means of satellites

and optical fibres. The system would also include video communications.

The Eurobio component of the Eureka research programme involved plant genetic engineering to improve plant strains, and bio and medical engineering. The Euromat component was to develop new materials for use in a high efficiency industrial turbine. Eurohome was development of technologically advanced product used in the house. Eurotype was a programme to accelerate the accomplishment of Euro-standards.[9]

It was hoped that nineteen member Eureka developed administrative machinery, funding methods and specific research projects in 1985-86, would result in a resurgent technological Europe. Under the banner of Eureka funding, priority was given to private capital first, open markets second and government subventions last.[10]

President Mitterand said that countries would be able to select the particular projects, they wanted to

---

9. Bhupendra Jasani, "The Military Use of Outer Space", SIPRI Yearbook 1986, pp. 144-145.

10. Pierre Henri Laurent, "Eureka or the Technological Renaissance of Europe", Washington Quarterly, Winter 1987, p. 62.

support, without being obliged to back them all.[11] At the Milan Summit, all European Governments were positive in their reactions. Combinations as Matra-Norsk Data, Thomson-Philips-Siemens-British General Electric, Matra-Messerschmidt emerged.

The London communique of 30 June 1986 stated that non-Eureka states with substantial European operations and employment could contribute to proposals and funds. Eureka contracts to US Corporations became a distinct reality with at least four firms designing projects in 1986. However, attracting more and more governmental money for investment in Eureka R&D remained the foremost need, if the basic objectives of the programme were to be accomplished.[12]

Although many Eureka projects took a step in the right direction, there was a widespread belief that Eureka was a poor substitute for the SDI because it combined the worst of all elements: insufficient public capital for investment in research, a high risk factor for those firms which are participating, and government regulations which

---

11. Trevor Taylor, "European Armament Cooperation", Royal United Services Institute and Brassey's Defence Year Book, 1986, pp. 193-196.

12. Samuel F. Wells Jr., "France and European Cooperation: Implications for US Policy", Atlantic Community Quarterly, Fall 1985, vol.23, no.4, pp.379-388.

stifle rather than promote entrepreneurship and a united focus on applied technology.[13]

Much of the thrust behind Eureka was blunted when many European Governments decided to permit their companies to participate in the SDI research programme. By the end of 1986, Britain, Federal Republic of Germany, and Italy had signed a MOU with the US. Most of the other allies refused to enter into a government to government agreement with US but left the door open for their industrial establishments' participation. French firms like Matra were also anxious to share in the windfall, despite public opposition to SDI. Hence, the French Government announced that it was not against private French industrial participation in the SDI.

On the other hand, Reagan Administration reacting to these developments, made increasing efforts to stress that a ballistic missile shield would include Europe under its umbrella. But most nations in Europe remained sceptical about the issue, given the technological difficulties and the contrast between the distinctive nature of the threat to Europe from short range ballistic and cruise missiles

---

13. n.3, p. 303.

and the space based orientation of the SDI programme. The uncertainty over the US approach could be seen in the proposal floated by German Defence Minister Manfred Worner to launch an EDI which would focus on European research and analysis of the problems of short medium range ballistic missile defence as well as defence against cruise and standoff missiles.[14]

Clearly, political and industrial leaders were interested both in SDI and the Eureka programme because of the fact that it promised lavish research spending. Both sought to accelerate military and civil programmes in order to develop vital technologies in information sciences and aeronautics. France had already made a good start in space industry, assuming technical and financial leadership in the first European Satellite launcher, Ariane. It tried to utilize the European space research programme to compete with Challenger and to deny the Americans a monopoly of outer space. On 7 February 1987, Mitterand further called for the establishment of a European Space Community to develop and deploy European controlled reconnaissance and communication satellites as well as space station. In his speech, the President spoke of a possible European missile defence system, which was later confirmed, more specifically in

---

14. SDI and Eureka in the Chapter: "West Europe: Looking Beyond INF", Strategic Survey (London: IISS, 1985-86), pp. 87-88.

November 1985.[15]

**Eureka: A Military Programme**

The areas of technology included in the Eureka proposal considerably overlap with those of the SDI programme. According to the French proposal, they are free electron lasers, high speed computer hardware and software, gallium assenide integrated circuits, microwave components, high density memories, various sensors, fibre optics, and new composite and ceramic materials.[16] Although both Europeans and US Governments have pointed out that Eureka proposal was not a technological alternative to the SDI, it does appear to be precisely that. A basic difference between the two was, however that, Eureka concentrated on marketable products. "The main challenge today is the interpenetration of an active research policy with a policy for industrial development responding to a market demand".[17] This would not mean that projects under the Eureka programme would be entirely irrelevant for military purposes. These projects would have military applications in the form of

---

15. n.7, p. 143.

16. n.11, pp. 289-290.

17. Stourdze, "SDI-Eureka: A Complementary Defense", Defence and Armament Journal, December 1985,p.22.

spin-offs. The underlying logic of Eureka proposal was that it is easier and less costly to reinvest civilian technology in a problem of defence, than to bet on eventual civilian spin-offs from purely military programme.[18] The director of a French high technology company had even gone so far as to suggest that Eureka could serve as a platform for future cooperation in the SDI programme. Such cooperation was perceived not to be beneficial to West European industry unless Europeans had sufficient technological expertise and success through Eureka (at the same time as SDI), solid projects in a few areas.

The collective security of the West largely depended on the technological edge. High technology industries are essential for both military and civilian applications. Some examples of military uses of these technologies are as follows :

1. Advanced composite material technology provides high-strength, light weight, survivable, corrosion-resistant component materials. They are producible more economically, faster and from domestically available materials.

---

18. Ibid., p.20.

2. Genetic engineering can be used to develop chemical and biological detection systems, vaccine antidotes, and other compounds for prevention and treatment of casualities. An important long term goal would be to make chemical/biological warfare as unattractive as possible to the Soviets.

3. Advanced visible and infrared sensor technology improves capabilities passively to detect and identify targets at night or under adverse observation conditions. Developments in focal plane arrays, charge-coupled devices, and other detector technologies will permit achievement of these capabilities.

4. Milimeter wave technology will permit to 'see' through battlefield smoke, fog and dust, with applications to technical homing missiles and to self-guided artillery ammunities.

5. Very high speed integrated circuits are the building blocks for the computers heeded for intermediate level tasks like automatic target recognition (using data produced by the above mentioned sensors) for higher-level tasks like analyzing and integrating battlefield data, and to aid in battle management and tactical decision-making. Development of new semi-conductor materials such as Gallium Arsenide

will permit similar capabilities to be realized with smaller systems that have lower power and cooling requirements and better environmental properties (e.g. radiation hardening).

6. Robotic/artificial intelligence systems would help to analyze data and organise their presentations, and also to optimize the results that human operators can obtain from machine. They should also permit remote controlled hazardous operations which may someday become much cheaper without the constraints of maintaining a suitable environment for man.

7. Progress of these depends on continuing progress in basic and applied computer science: directly through, the development of new, reliable, faster and systemic ways of writing software and also indirectly, by the development of computer-aided design techniques, manufacturing and inspection procedures to produce lighter weight, more reliable combat and support vehicles with enhanced mobility and needing less logistic support.[19]

One can note that throughout this list there exists a close relationship between civilian and military applications.

19. Jean Francois Delpech, "New Technologies, the US and Europe: Implications for Western Security and Economic Growth", Atlantic Community Quarterly, vol.25, no.1, Spring 1987, pp. 52-53.

Never before did the civilian and the military sectors reinforce each other and make good use of the cross-fertilization potentialities of high technologies, as they are being done now. Eureka programme can be seen as a good example of this cross-fertilization.

The French did not discount the possibility of using Eureka to develop technology applicable to SDI when they proposed Eureka as a way to maintain technological equality with countries which participated in SDI. The Eureka programme had allowed companies from countries such as Norway and Netherlands whose governments had officially rejected a direct role in SDI, to develop SDI-related technology. For example, Norsk Data of Norway was working with Matra of France to develop high speed computer technology. Philips of Holland worked with West Germany's Siemens, General Electric Co. of Britain and France's Thomson on advanced processors, gallium arsenide integrated circuits and other components and sensors.[20]

While Eureka was gathering momentum, France and Federal Republic of Germany in December 1985 established a joint planning institution to consider an EDI based on

---

20. "Firms Nove SDI-Applicable R&D through Eureka", Aviation Week and Space Technology, December 16, 1985, p.15.

an ATBM system. ATBM system favoured an interceptor based on kinetic energy weapons. Technologies like computers would be utilised for applications in any future EDI based ATBMs.[21]

Thus, while Europe may develop high technology and claim that it was for civilian purposes, its military implications cannot be ruled out. Moreover, there are companies like Matra of France and Fiat of Italy who are participating in both the research programmes i.e., SDI and Eureka.

**Other European Cooperation Efforts**

It is very significant to note that while France was promoting an exclusive European programme, Eureka, independent of SDI, there was an increasing trend in cooperation on defence related projects at the EEC and NATO levels. These developments could be interpreted at two levels. Firstly, these developments could be seen as an effort of the European nations not to be tied up with the Eureka programme which was exclusively directed by France but to work out, ways and means through similar established agencies like NATO, EEC and ESA. Secondly, it could be an effort of US to weaken the French leadership in Europe on a parallel programme like Eureka by increasing their cooperation at NATO level.

In context of first interpretation, it may be stated that European Economic Community devoted an increasing proportion of its budget to cooperative research programmes. ESPRIT (European Strategic Programme for Research in Information Technology) was the most visible of these. It involved $ 2 billion over five years, aimed at devising application programmes like advanced micro-electronics, software technologies, computer architecture, and advanced information processing, office and factory information technologies and computer integrated design and manufacturing. While lacking an adequate strategic concept and focus, ESPRIT nevertheless promoted precompetitive Information Technology cooperation to establish a European technological base with a transnational investment design.[22]

RACE (Research into advance communication technologies in Europe) and BRITE (Basic research in Industrial Technologies for Europe) were launched by EEC. RACE addressed the growing concerns in the field of telecommunications, with a goal of inviting all the EEC countries by the year 1995 into a single integrated broad-band communications network and services.[23] BRITE aimed to stimulate cooperative,

---

22. Report of Commission of the European Communities, "ESPRIT for Europe", European File (Brussels),no.5,1984.

23. Report of Commission of the European Communities, "European Community and New Technologies", European File (Brussels), no.8, 1984.

precompetitive R&D in areas of bio-molecular engineering research programmes. This programme has market-oriented profile. Ninety-five proposals had received contracts for funding computer aided design, and manufacturing was the major element of the programme which involved contract's worth European currency (ECU) 250 million.[24]

To overcome financial difficulties, risks, EEC promoted a scheme to create "high technology risk capital". This would result, by having a joint venture with a group of banks and finance houses. A company could have funds worth ECU 500 million, with the community administering twenty per cent of the share. The proposed risk capital scheme was potentially important in itself and a further symptom of the wish in all the community institutions to shift policies for new technologies towards the market.[25]

However, in context of the second interpretation, at the NATO level, on 22 May 1985, the Senate passed an amendment to the 1986 defence authorization bill, providing $ 200 million for cooperation in R&D among the NATO members. This bill, known as New Nunn NATO Amendment, listed conventional defence equipment which could be treated side

---

24. Report of Commission of the European Communities "BRITE" European File No.195, 1985.

25. Christopher Farrands, "New Technologies", European Trends (Brussels) no.2, 1986, pp. 33-43.

by side within the NATO countries.[26] This money was to be divided into four parts: $ 50 million to each of the three services, $ 50 million to the Defence department agencies. The amendment also authorized expenditure of an additional $ 50 million for side by side testing of allied and American systems. This could have far reaching consequences as it directed the Department of Defence to identify and consider cooperative development, or existing systems of allies as alternatives to US system at every step of the acquisition process. The money had to be spent in the US. In order to encourage allied contributions, US money could not be spent without a cooperative program governed by a formal agreement. These conditions had positive consequences for the Alliance. Letter of Intent for six multinational development projects had been signed by armament directors of twelve NATO countries, with partial financing by the funds authorized by the Nunn-Roth Warner Amendment. These projects are :

1. A stand-off airborne radar demonstrator system for surveillance and target acquisition programs.

2. An autonomous, technically guided 155 mm munition programme.

3. Question and answer components for the NATO ifentification system which included IFF (Identification Friend or Foe) equipment

---

26. Ewan Anderson, "NATO Procurement must travel a Two-Way Street:A New Spirit of Cooperation evolves", Journal of Defence and Diplomacy (Washington D.C.) vol.5, no.9, 1987, p. 34.

4. A multi-function information distribution system.

5. A modular standoff weapons program.

6. A support environment for the ADA high level computer language. (27)

Besides the development of these projects on the NATO level, several nations had started research on these projects independently. France and Germany asserted that signatory nations should also be allowed to participate in the initial planning stages of what were called "Nunn Cooperative Projects".

Industry-to-industry cooperation was viewed with scepticism in Europe since it was believed to favour US companies which were larger than European companies and thus would tend to dominate any partnership. Moreover, there exists uncertainty about satisfactory resolution of the technology transfer problems. Nevertheless, US has initiated various cooperative programmes with the allies. The US's budget for fiscal year 1987 contains new provisions for cooperation with allies such as Senate's Balanced Technology Initiative, the House's conventional defence initiative and a Senate defence Initiative, and a Senate proposal to earmark $ 50 million in SDI funds for exploration of antitactical ballistic missile systems. It remains to be

---

27. n.21, pp.60-61

seen as to what practical impact would such measures have on US-European allies cooperation.[28]

Mention should also be made of the European Space Agency (ESA) which had been very successful in putting Europe into space business with a current budget of $ 830 million (about 10 per cent of NASA's budget). Increase in finances were for the development of Ariane-5 launches, which had sufficient thrust to launch a space station into orbit, and built a Columbus space station. ESA had undercut the American shuttle in the area of satellite launching by Ariane rockets. Other European developments include the Skynet communications satellites of the British, the Eureka space vehicle and space labs developed by a consortium of European countries and Herme spacecraft by France.[29] In the military sphere, German and Italian collaboration resulted in the successful development and manufacturing of Tornado fighter. This collaboration has been expanded to include France and Spain for the development of a European fighter aircraft.

There exists a common threat running through most of the programs discussed above. It was recognised that it would not be possible to produce common equipment and

---

28. n.21, p. 61

29. The New York Times, 17 March 1985, pp. 111-13

that agreement would only be reached by focussing on components rather than systems. The fact that the programmes were still at an early stage paved the way for cooperation on common components that could be incorporated into the systems of more than one nation. Therefore, Eureka proposal was not just a direct alternative to SDI, but to meet the latter's challenge, it capitalized on the message. The challenge represented problems relating to continuous and enlarged financing, cartels, administrative efficiency and duplicating research subsidies. The stubborn reality is that the process would require a much longer time and more coordinated attention and emphasis by the EC Big Four (France, Great Britain, West Germany and Italy) within the European Council and in close harmony with the EEC Commission.

It would be Eureka, EEC and NATO cooperation projects and not SDI which would contribute directly to the needed major internal revolution that would in turn, diminish and annihilate national partitions and structural rigidities. This would highlight a one-Europe perspective. In effect, Europeans could participate minimally in SDI, but move towards global competitiveness and European internal reorganization would be primarily through large technology markets as developed by Eureka and other European Corporations.

# CHAPTER V

## CONCLUSIONS

The American Strategic Defence Initiative (SDI) programme has complicated American-European relations at various levels: political, strategic, economic and foreign policy. The Europeans perceive the SDI to be another sign of American unilateralism, in strategic and foreign policy formulation, to which they have been subjected for the last four decades. The Reagan Administration's failure to fully inform the European allies prior to the announcement of the SDI has strengthened the European suspicion that defences were primarily, if not exclusively, intended to protect the US only. For political, technical and strategic reasons Americans needed European participation in the SDI, but the European participation was sought on the basis of 60 days ultimatum. However, the sixty day ultimatum was soon withdrawn following European protests. Nevertheless, the offer brought home the realization that on the one hand, the Europeans were losing out in the technological race vis-a-vis the US and Japan and the financial gains to be acquired by participating in the SDI programme, on the other, resurgent American unilateralism. Eventually, the Europeans opted for participation in SDI.

SDI has become a major public issue in some of the European political debates. Several important opposition parties in Western Europe have criticised the SDI. The support thus far by the European allied governments for SDI is due, in part, to a desire to maintain unity within the alliance, and other part to a concern that criticism of the programme might imply that they oppose the United States Government's attempt to shield its population from nuclear attack.

The European allies remain uncertain over the objectives of SDI. Different voices within the Reagan Administration have described SDI in different ways. Some have said its goal must be to lead the development of technology that will provide a defence for the American population against ballistic missiles; others contemplate a partial, or point defence, of strategic systems as a means to insure a U.S. retaliatory capability in the event of a Soviet nuclear attack. The Europeans are uncertain that such a defensive system could extend to the European Continent, given their geographic proximity to the Warsaw Pact. This would result in vulnerability to manned bombers, ground-launched or sea-launched cruise missiles and other low-trajectory missiles ostensibly able to penetrate an ABM system.

The history of nuclear arms race has established that any new nuclear system the US had deployed, was soon followed by the Soviet deployment of similar system. The Europeans strongly believe that American SDI deployment would result in parallel Soviet deployment of SDI system soon. Under such parallel deployment, the European allies fear that they would find themselves in an uncomfortable middle ground, vulnerable to Soviet attack and saddled with the psychological uncertainty of American support in the event of such an attack. The Europeans, especially Britain and France fear that a parallel Soviet SDI deployment would reduce or negate the ability of their nuclear weapons to penetrate their targets in the Soviet Union. One consequence of this would be that medium sized nations who had already commenced modernization of their independent nuclear deterrents, would soon lose in technological race and would find it impossible to utilise the strategy of the weak deterring the strong, by means of nuclear weapons.

The NATO allies continue to embrace the doctrine of nuclear deterrence, a doctrine that had provided Europe with a long period of peace. Should SDI result in their own protection from nuclear attack, security of the allies would not be necessarily enhanced. In their view, this would result in a return to the era of conventional warfare which

might lead to recurrence of conventional arms race and the incentive to contemplate the possibility of victory in a European war against an adversary - development that nuclear deterrence has largely muted, in their view, for the past three decades. In addition, many officials in European allied governments believe that modern conventional warfare could prove as destructive to Europe, as nuclear warfare.

Should both the United States and the Soviet Union deploy a ballistic missile defence, Europeans feel that such a system would pose significant questions for NATO and Warsaw Pact strategy in Europe. NATO's doctrine of "flexible response" relies on the potential use of nuclear weapons, if necessary to defend successfully against a Warsaw Pact offensive, given the Pact's conventional force superiority. While a ballistic missile defence deployed by the Warsaw Pact would not prevent the use of a range of nuclear weapons - short-range missile or tactical nuclear weapons and bombers - it would undercut the ability to threaten further escalation. The effect of the loss of this ability at the upper end of the escalatory ladder is uncertain, and hence uncertain deterrent.

Europeans strongly believe that SDI programme would promote offensive and defensive arms race. This, they feared,

directly threatened their security. Moreover, they perceived that the US spending on strategic defence would result in the U.S. pressurizing the European nations to increase their defence expenditure and especially modernize and increase their contribution to the conventional forces of the NATO. The Europeans have consistently rejected any dominantly conventional role for themselves in the NATO defence strategy. They always favoured the substitution of nuclear weapons for conventional build-up.

The Europeans regarded ABM Treaty (1972) as a landmark in post-war arms control negotiations. They believed, by limiting the superpower anti-missile defence, their nuclear weapons had a role in deterrence. Moreover, the Treaty was overwhelmingly supported by the European countries as a symbol of superpower ability to negotiate and compromise. It was valued in Europe for its catalyst role in other negotiations like security and cooperation in Europe (CSCE) and conventional force reduction (MBFR). The Europeans were very sensitive to any suggestion, to amend or abrogate the ABM Treaty. They feared that the SDI could undermine the ABM Treaty. Such an event, the Europeans feared, would be a major set-back for European security, as they define security in terms of defence and detente.

The Europeans expected the US to use SDI as a bargaining chip to achieve reduction in the strategic offensive forces. The Soviets, in the arms control negotiations proposed reduction or complete removal of intermediate forces from Europe, in bargain for non-deployment of SDI. US did not concede to either of these demands and later Soviet Union conceded. This facilitated the signing of INF Treaty on 8 December 1987 by Reagan-Gorbachev in Washington.

The INF Treaty has restored the situation of 1979 i.e. a balance of theatre nuclear force. However, this Treaty has not changed European dependence on American nuclear guarantee. In the event of Soviet conventional onslaught, the European allies have the option to use battlefield and tactical nuclear missiles. Should these nuclear weapons be unable to deter a Soviet conventional thrust in Europe, then there exists no alternative for the Europeans to protect themselves. Under the terms of the INF Treaty all intermediate nuclear weapons under the control of US missiles would be out of NATO arsenal. Hence, the NATO allies depend exclusively on US strategic deterrent to hold the ultimate deterrent power. Nevertheless, Europeans fear that the operation of this deterrent may be effected, if the Soviets were successful in deploying a parallel SDI programme. This would be critical for European security. Thus, the INF Treaty and

SDI programme neither fulfils the security aspirations of the Europeans nor it enhances European security.

SDI programme did not spontaneously appeal to the Europeans for many reasons: (a) money available for foreign participation amounted to a mere $ 1 billion divided among 'n' number of allies and companies, leading to a minimal economic benefit for any country that decided to participate; (b) US leaders wanted European countries to participate in such ventures where European competence was superior; (c) European participation in the programme proved to be a loyalty test for the allies, as unwillingness on the part of Europeans to contribute their share to the common defence could lead to an adverse burdensharing debate; and (d) US restrictions imposed on American scientific conventions, especially barring non-Americans at scientific conventions, and the growing role of the Pentagon in reviewing and granting export licenses on non-military commercial technologies ruled out a prospect of a truly equal and joint cooperation on SDI.

Inspite of these disadvantages, the European Governments decided to participate in the venture. European response to SDI was supportive (positive) and critical (negative). European participation took the form of a governmental agreement to guide the participation of private companies. Once Britain became a part of the SDI programme, other countries

like Federal Republic of Germany, Italy also signed agreements with the United States to participate in the research effort. These countries had hoped to garner technological spin offs and financial gains from the programme. However, the European hopes were disillusioned. The barriers to European participation in SDI increased substantially during 1985-86 and Europe became more and more wary about the size and number of contracts. Out of the $ 26 billion of the original amount, only $ 7 million in funds were actually committed to Europe by June 1986. The US counterparts, however, had $ 8.5 billion worth of contracts. Europeans' were initially expecting 10 per cent of the total or $ 3 billion but the current estimate was that they would receive only one per cent of the total. All these facts strengthen the European belief that Europe's part in the SDI would be of a secondary subcontractor and that the original lure of a greater share of the budgetary outlay of SDI programme was a mirage and doubtful in future.

Furthermore, from 1987, Reagan Administration under Congressional pressure, was pursuing a policy of promoting European participation in the SDI programme, provided the Europeans also made financial contribution. There are clear indications that the Pentagon increasingly influenced the White House on the flow of technology transfers to Europe, under the pretext of security. Hence, the technology transfer

to Europe has been selective so far. This is contrary to original plan of cooperation where Europeans were asked by US for participation in SDI research programme. The US policy statements had indicated that there would be both financial and technology flow to Europe without restrictions to prevent any further hostage to American unilateralism, the French President Mitterand proposed Eureka (European Research Coordination Agency) to counter SDI programme. In fact, Mitterand desired a Euro-based technology to bridge the technological gap vis-a-vis US and Japan.

France wanted cooperation on the kind of technologies demanded by SDI, so as to reduce the temptation for European companies to participate in Star Wars and to raise the level of Europe's technological efforts. Other European nations insisted that Eureka be purely civilian. In theory, the project is civilian but the technologies to be pursued and are currently being pursued seem likely to be suitable for space-based defence in nuclear war fighting. Hence, there exists in Eureka, a close relation between civilian and military application technologies. Never before did the civilian and military sectors reinforced each other in such a way as to make good use of the cross-fertilization potentialities of high technologies, as they are being done now. Eureka programme can be seen as a good example of this cross-fertilization.

Although many Eureka projects took a step in the right direction, there was a widespread belief that Eureka was a poor substitute for SDI because it combined the worst of all elements: insufficient public capital for investment in research, a high risk factor for those firms which are participating, and government regulations which stifle rather than promote entrepreneurship and a united focus on applied technology.

Within European countries there is a trend not to allow French leadership or domination in Europe through the Eureka project. Hence, the European countries which opted for participation in the Eureka programme have simultaneously been promoting high technology research through various EEC organisation and NATO agencies. It seems that the US is also in the game of challenging French influence by providing additional financial support for research projects under NATO auspices. However, all these efforts seem to benefit an overall Europe but there are some challenges too. These challenges represented problems relating to continuous and enlarged financing, cartels, administrative efficiency and duplicating research studies. The stubborn reality is that the process would require a much longer time and more coordinated attention and emphasis by the EEC. Big Four (France, Great Britain, FRG and Italy) within the European Council and in close harmony with the EEC Commission.

In sum, the American unilateralism as far as SDI is concerned, is a challenge to the European countries. Majority of European countries differed with US on the consequences of deployment. They pointed out that SDI could result in decoupling of Eurostrategic forces and Central Strategic forces, encourage nuclear first strike, undermine nuclear deterrence strategy of NATO, increase the burden of conventional forces modernization, lower the credibility of independent nuclear deterrents and undermine the ABM Treaty. Inspite of these differences, European countries participated in the SDI programme, which brought to the Americans, the much valued political backing of the allies, in an enterprise, which in its search for lost superiority could endanger world peace.

# SELECT BIBLIOGRAPHY

## PRIMARY SOURCES


### PARLIAMENTARY PUBLICATIONS

United Kingdom, House of Commons, Parliamentary Debates (Hansard) 1984-87.

United Kingdom, House of Lords, Lord's Debates (Hansard), 1984-87.

United States, Congressional Almanac, 1984-87.

United States, Congressional Digest, 1984-87.

United States, Congressional Quarterly, 1983-87.

United States, Congressional Record, 1983-87.

### E.E.C., N.A.T.O. & W.E.U. DOCUMENTS

Commission of the European Community, "Fast: Where does Europes' Future Lie?" European File (Brussels), No. 7, 1984.

Commission of the European Communities, "The European Community and New Technologies", European File (Brussels), No. 8, 1984.

European Report on "Declaration of Principles relating to Eureka" EC/DOC (Hannover), No. 1174, 9 November 1985.

Interim Report of the NATO Sub-Committee on "Advance Technology and Technology Transfer", North Atlantic Assembly (Brussels), October 1985.

Lefebure, Thomas, Rapporteur Draft General, Report of the Scientific and Technological Committee, North Atlantic Assembly (Brussels), April 1985.

Report of Commission of the European Communities, "ESPRIT for Europe", European File, No. 5, 1984.

Report of Commission of the European Communities, "BRITE", European File No. 195, 1985.

"Towards a European Technological Community, Memorandum of the Commission of the European Communities, COM (85) 350 Final (Brussels) 25 June 1985.

WEU/DOC/1033, "W.E.U. and S.D.I." (Brussels), 4 November 1985.

## GOVERNMENT DOCUMENTS

Ashton, B. Carter, "Direct Energy Missile Defence in Space" (Washington D.C.: US Congress Office of Technological Assessment, April, 1984).

Gallis, Paul, E. The Strategic Defense Initiative and United States Alliance Strategy (Washington D.C.: Congressional Research Service, The Library of Congress, 1985).

President's Report to the Congress, "Soviet Non Compliance with Arms Control Agreement" (Washington D.C., Government Printing Office, 2 February 1985).

Report to the Congress on SDI, "The SDI and ABM Treaty" (Washington D.C.: Department of Defence, 18 April 1985).

Report of the President's Commission on Strategic Forces (Washington D.C.: United States Government Printing Office, April 1983).

Report to the Congress on U.S. Policy on A.S.A.T. or arms control (Washington D.C.: White House, 31 March 1984).

Secretary of State for Defence, Statement on the Defence Estimates, Part I (London: Her Majesty's Stationary Office, 1984).

U.S. Department of Defense Annual Report to the Congress Fiscal Year 1985 (Washington D.C.: United States Government Printing Office, 1 February 1984).

United States Department of Defense, "Assessing the effect of Technology on U.S./Western Europe: A Defence Perspective" (Washington D.C.: Department of Defence, May 1985).

U.S. Department of State, "Strategic Defense Initiative", Special Report No. 129 (Washington D.C.: Bureau of Public Affairs, June 1985).

U.S. Department of Defence, Strategic Defence Initiative Organisation: Report to the Congress on Strategic Defense Initiative (Washington D.C.: Bureau of Public Affairs, 1985)

## OFFICIAL STATEMENTS AND SPEECHES

D'Aboville, Bernard, "European Attitudes Towards SDI (New York: French Embassy Transcript, 8 November 1984).

Genscher, Hans Detrich, "Eureka" in Bulletin (Bonn: Press and Information Office of Federal Government, 7 November, 1985).

Howe, Geoffrey, "Defence and Security in Nuclear Age: British View" (London: Royal United Services Institute, 15 March 1985).

Hurd, Douglas, "Arms Control and Disarmament" to the United Nations (London: Arms Control Disarmament Research Unit of Foreign and Commonwealth Office, No. 10, November 1981).

Mitterand, Francois, "Reflections ure la politique exterieure de la France" (Paris: Fayard, 1986).

Nitze, Paul. H, "On the Road to a More Stable Peace", US Department of State Bulletin (Washington D.C.), 20 February 1985.

Reagan, Ronald Addresses to the Nation on March 23, 1983: A Report 85-48F (Washington D.C.: Congressional Research Service, 1 February 1985).

## SECONDARY SOURCES

### BOOKS

Abraham, Wiesner, J.B., et.al. ABM: An Evaluation of the Decision to Deploy an Anti Ballistic Missile System (New York: Harper & Row, 1969).

Anzovin, Steven (edited) The Star Wars Debate (New York: H.W. Wilson & Co., 1986).

Ben, Bova, Assured Survival: Putting the Star Wars Defence into perspective (Boston: Houghton, 1985).

Boutwell, J.D., Doty, P., et. al. (eds.) Nuclear Confrontation in Europe (London: Croom Helm,1985).

Brzezinski, Zbigniew, Promise or Peril: The Strategic Defense Initiative (Washington D.C.: Ethics and Public Policy Center, 1986).

Bueunke, R.H. (edited), Strategic Defense Initiative (Arlington: Pasha Publications, 1986).

Carter, A.B., Schwartz, D.N., Ballistic Missile Defence (Washington D.C.: Brookings Institution, 1984).

Dean, Jonathan, Watershed in Europe: Dismantling the East-West Military Confrontation (Lexington: D.C. Heath and Co., 1987).

Drell, S.D., Farley, P.J., Holloway, D. (edited), The Reagan Strategic Initiative: A Technical, Political and Arms Control Assessment (Cambridge: Ballinger Publishing Co., 1985).

Flanagun, S.J., Hampson, F.O., Securing Europe's Future (London: Croom Helm, 1986).

Fossedal, G., Graham, D.O. A Defense that Defends: Blocking Nuclear Attack (Greenwich: C.T., 1984).

Goldstein, Walter (edited), Fighting Allies: Tensions within the Atlantic Alliance (London: Brassey's Defence Publishers, 1986).

Grewe, Wilhem, The Effect of Strategic Agreements on European American Relations (London: Adelphi Library, International Institute for Strategic Studies, February 1970).

Hassel, Kaillwe von., The European Defence Initiative: Implications for Western Security Policy (Rottadam: High Frontier Europa, 1986).

Hudson, G.E., Kruzel, Joseph (edited), American Defense Annual 1985-86 (Lexington: D.C. Heath & Co., 1985).

Hough, Jerry, Arms Control and Strategic Defence Initiative (New York: Stanley Foundation, 1985).

Jasani, Bhupendra (edited) Space Weapons and International Security (London: SIPRI/Oxford University Press, 1987).

Jasani, B., Lee, Christopher, Countdown to Space War (London: SIPRI/Oxford University Press, 1984).

Jastrow, Robert., How to make nuclear weapons obsolete (New York: Praeger Publishers, 1985).

Kelleher, C. McArdle, Germany and Politics of Nuclear Weapons (New York: Columbia University Press, 1975).

Kaldor, Mary., Falk, Richard, Dealignment: A New Foreign Policy Perspective (Oxford: Basil Blackwell/The United Nations University, 1987).

Meredith, Christopher (edited), Space Weapons: Deterrence or Delusion? (Cambridge: Polity Press, 1986).

Miller, D.E., Evera, S.V., The Star Wars Controversy (Princeton: Princeton University Press, 1986).

Mottala, Kari (edited), Ten years after Helsinki: The making of the European Security Regime (Helsinki: Finnish Institute of International Studies, 1986).

Nurick (edited) Nuclear Arms and European Security (London: Adelphi Library International Institute of Strategic Studies, 1983).

Olive, Porro, J.D. (edited), Nuclear Weapons in Europe: Modernization and Limitation (Lexington: D.C. Heath & Co., 1983).

Osgood, R.E., NATO: The Entangling Alliance (Chicago: University of Chicago Press, 1957).

Pressler, Larry, Star Wars: The Strategic Defense Initiative Debates in the Congress (New York: Praeger Publishers, 1986)

Raj, Christopher Sam, American Military in Europe: Controversy over NATO Burdensharing (New Delhi: ABC Publishers, 1983).

Schwartz, D.N., NATO's Nuclear Dilemma (Washington D.C.: Brookings Institution, 1983).

Stares, P.B., Militarization of Space: U.S. Policy 1945-84 (New York: Cornell University Press, 1985).

Star Wars: Delusions and Dangers (Moscow: Military Publishing House, 1985).

Stein, J.B., From Hydrogen Bomb to Star Wars: The Politics of Strategic Decision making (Lexington: D.C. Heath & Co., 1986).

Stone, J.J., The Case against Missile Defences (London: Adelphi Library International Institute for Strategic Studies, April 1968).

Thomas, Enders, Missile Defence as part of an Extended Air Defence (Sank Augustin: Konard Adenauer Foundation, 1986).

Thompson, E.P. (edited), Star Wars (Middlesex: Penguin Books, 1985).

Tirman, John, The Fallacy of Star Wars: Why Space Weapons can't protect us (New York: Vintage Books, 1984).

Union of Concerned Scientists, Empty Promise: Growing Case against Star Wars (Boston: Beacon Press, 1986).

Union of Concerned Scientists, The Fallacy of Star Wars (New York: Vintage Books, 1984).

Weinrod (ed.) Assessing Strategic Defence : Six Roundtable Discussions (Washington, D.C.: Heritage Foundation, 1985).

Weinstein, J.M., Kennedy, R., The Defense of the West: Strategic implications of European Security (Boulder: Westview Press, 1984).

Williams, G.L., Williams, A.L., The European Defense Initiative: Europe's Bid for Equality (New York: St. Martin Press, 1986).

## ARTICLES

Abrahamson, James, A. "Strategic Defense Initiative: A Technical Summary" NATO Sixteen Nations (Netherlands), Vol.31, No. 2, April 1986, pp. 14-19.

Anderson, Ewan, "NATO procurement must travel a two-way Street: A New Spirit of Cooperation evolves", Journal of Defence and Diplomacy (Washington D.C.), Vol.5, No.9, 1987, pp. 32-34.

Babic, Manojlo, "Project Eureka" Review of International Affairs (Yugoslavia), vol. 36, No. 851, 20 September 1985, p. 20.

Bertram, Christoph, "Strategic Defense and the Western Alliance" Daedalus (Massachusetts), vol. 114, No.3, Summer 1985, pp. 279-96.

Bluth, Christopher, "Strategic Defense Initiative: The Challenge to West Germany" International Affairs (London), vol. 62, No. 2, Spring 1986, pp. 247-264.

"Britain Signs MOU to Participate in SDI", Aviation Week and Space Technology (New York) 16 December 1985, p. 12.

Brown, David, A., "European Industry Begins to seek US SDI contracts", Aviation Week and Space Technology, vol. 123, No. 24, 16 December 1985, pp. 12-15.

Bundy, M. et. al, "The President's Choice Star Wars or arms control" Foreign Affairs (New York), vol. 63, Winter 1984/85, pp. 264-78.

Chalfont, "SDI in Context" U.S. Naval Institute Proceedings (Washington D.C.) April 1986, pp. 70-74.

Charles, David, "NATO Looks for Arms Control Loopholes" Bulletin of Atomic Scientists (Chicago), vol. 43, No. 7, September 1987, pp. 7-9.

Claude, Arnaud, "What is Eureka?" NATO Review (Washington D.C.) No. 3, June 1986, pp. 18-21.

Cook, N., "SDI, ADI and Soviet Threat" Janes' Defense Weekly (London), vol. 7, No. 8, 28 February 1987, p. 322.

Cross, James, "NATO Legislators overwhelmingly support strategic Defense" NATO Review, Vol. 33, No. 6, November-December, 1985, pp. 16-21.

"Debate over SDI Enters New Phase" Science (Washington D.C.), vol. 235, No. 4786, 16 January 1987, pp. 277-81.

Debre, Michel, "France's Global Strategy" Foreign Affairs, April 1971, pp. 395-403.

Delpech, Jean Francois, "New Technologies, the U.S. and Europe: Implications for Western Security and Economic Growth", Atlantic Community Quarterly (Brussels), vol. 25, No.1, Spring 1987, pp. 35-61.

Drell, S.D., Farley, P.J. and Holloway, D., "Preserving the ABM Treaty" International Security (Massachusetts), Fall 1984, pp. 54-58.

Emery, Peter, et. al. "SDI: An offer Europe shouldn't refuse", Armed Forces Journal (Washington D.C.), vol. 723, No.4, March 1986, pp. 75-89.

"Eureka: Off and Walking, but what is it?" Economist (London) vol. 296, 20 July 1985, pp. 42-51.

Europe is reluctant to reach for the stars" Economist, Vol. 294, 16 February, pp. 45-46.

"European SDI Study launches", Military Technology (Bonn), vol. 11, No. 1, 1987, p. 988.

"Europeans approve more Eureka Projects", Aviation Week and Space Technology, 5 October 1987, p. 12.

Farrands, Christopher, "New Technologies" European Trends (Brussels), No. 2, 1986, pp. 33-43.

Feazel, Michael, "European leaders Expect International Participation in Defense Initiative" Aviation Week and Space Technology, 27 May 1985, p. 101.

"Firms Move SDI - Applicable R&D Through Eureka", Aviation Week and Space Technology, 16 December 1985, p. 15.

Fletcher, J.C., "Technologies for Strategic Defence, Issues in Science and Technology (Washington D.C.), Fall 1984, p. 73.

Freedman, Lawrence, "NATO and the SDI" NATO Sixteen Nations, November 1984, pp. 18-21.

Freedman, Lawrence, "The Small Nuclear Forces", NATO Sixteen Nations, December 1983-January 1984, pp. 25-28.

"French Signals" Aviation Week and Space Technology, 3 Nov. 1986, p. 13.

Frenske, John, "France and SDI: Speeding in, putting the brakes", International Affairs, vol. 62, No.2, Spring 1986, pp. 231-246.

Froman, Michael, B., Gardner, Anthony, I. et. al., "Strategic Implications of SDI for France and West Germany" RUSI Journal (London) June 1987, pp. 50-55.

Froman, Michael, et. al. "France and SDI", The Army Quarterly and Defense Journal, vol. 117, No. 3, July 1987, pp. 200-203.

Galtung, Johan, "The Real Star Wars Threat" Nation (London), vol. 244, No. 8, 28 February 1987, pp. 248-250.

Garaud, Marie-France, "Foreign Perspectives on the SDI" Daedalus, vol. 114, No. 3, Summer 1985, pp. 308-312.

Geneste, Marc, "Strategic Defense and the shield of Europe" Strategic Review (Washington D.C.), vol. 31, No. 2, Spring 1985, pp. 37-43.

"Germany Joins SDI Programme", Flight International (England) 12 April 1986, p. 12.

"Grand Compromise: SDI could end the arms control stalemate" Time (Chicago), vol. 127, No. 25, 23 June 1986, pp. 22-23.

Grewlich, "Eureka-eureka?" Aussen Politik (Hamburg), vol.37, 1st Quarter, 1986, pp. 24-36.

Hamm, Manfred, R., Weinrod, W.B., "Trans-Atlantic Politics of Strategic Defense" Orbis (Philadelphia), vol.29, No.4, Winter 1986, pp. 709-34.

Hamm, Manfred, R., "Strategic Defense and the West German Social Democrats" Strategic Review, Spring 1986, pp.16-25.

Hamm, Manfred, R., Holmes, K.R., "European Anti-tactical Ballistic Missile System, Deterrence and Conventional Defense of NATO", Washington Quarterly (Cambridge, Mass), vol.10, no. 2, Spring 1987, pp. 61-78.

Herres, R., "Space Grows in Importance to the National Security" Defense (Berks), November-December 1986, pp.17-25.

Holm, Hans Henrik, "SDI and European Security: Does Dependence Assure Security" Alternatives (New Delhi) vol.10, No.4, 1985, pp. 517-32.

Howard, Michael, "Arms Control and Disarmament NATO Fifteen Nations (Netherlands), December 1970-January 1971, p.44.

Hua, Xing, "SDI: Western Europe face a challenge Beijing Review (Beijing) 5 August 1985, pp. 22-25.

Kanter, A., "Thinking about the SDI: An Alliance Perspective" International Affairs, vol. 61, No. 3, Summer 1985, pp.449-464.

Kaiser, K., Leber, George, et. al., "Nuclear Weapons and the Preservation of Peace" Foreign Affairs, vol. 60, No.5, Summer 1982, pp. 1143-1161.

Kemp, Jack, "The Politics of SDI" National Review (Washington. D.C.), vol. 38, No. 25, 31 December, 1986, pp. 28-31.

Koehl, Stuart, "Strategic Defense Initiative and its potentials for European Industry" Journal of Social, Political and Economic Studies (Washington D.C.), vol. 10, No. 4, Winter 1985, pp. 387- 90.

Laird, Robbin, F., "The French Strategic Dilemma" Orbis, Summer 1984, pp. 307-308.

Laird, Robbin, F., "French Nuclear Forces in the 1980s and the 1990s",Comparative Strategy, vol. 4, No. 4, April 1984, pp. 396-398.

Laurent, Pierre, Henri, "Eureka or the Technological Renaissance of Europe", Washington Quarterly, vol. 10, No. 1, Winter 1987, pp. 55-66.

Lellouche, P., "SDI and Atlantic Alliance" Atlantic Community Quarterly, vol. 23, Fall 1985, pp. 211-221.

Lerner, Eric, J., "Star Wars: Feasibility" Part I Aerospace America (New York), August 1985, pp. 60-64.

Lerner, Eric J., "Star Wars: Survivability and Stability", Aerospace America, September 1985, pp. 80-84.

Lerner, Eric J. "Star Wars: Who wins the cost exchange?" Aerospace America, October 1985, pp. 60-66.

Lerner, Eric J., :Star Wars: Counter-measures and uses of SDI", Aerospace America, November 1985, pp. 60-63.

Lucas, Michael, "SDI and Europe: Militarization or Common Security" World Policy Journal (London), vol. 3, No.2, Spring 1986, pp. 219-49.

Manual Stewart, "Europe's stake in Ballistic Missile Defense" Journal of Social, Political and Economic Studies, vol. 9, No. 2, Summer 1984, pp. 184-195.

Marsh, Peter, "SDI: After High Hopes, Europe Getting R&D Crumbs" Science and Government Report (London), June 1987, pp. 18-19.

Mehrotra, O.N., "NATO and Star Wars programme", Strategic Analysis (New Delhi), vol. 9, No. 2-3, May-June 1985, pp. 189-96.

Meredith, Pamela, "The legality of a High Technology Missile Defense System", American Journal of International Law Washington D.C.) vol. 78, No. 2, 1984, pp. 417-423.

Nagorski, Andrew, "From skepticism to support on Star Wars", Europe is divided over Reagan's Defense Plans" Newsweek (New York) vol. 105, No. 18, 16 May 1985, pp. 26-27.

Peter, Richard, "The Eastward Technology Flow: A Plan for Common Action", Strategic Review, Spring 1984, p. 51.

Pierre, Andrew, "Nuclear Diplomacy: Britain, France and America", Foreign Affairs, January 1971, pp. 280-287.

Risse, Kappen, T., "Western Europe and Nuclear arms control: case of INF and SDI" Bulletin of Peace Proposals (Toxen), vol. 16, No. 3, 1985, pp. 283-290.

Rivikin, D.B., "What does Moscow Think?" Foreign Policy (Washington D.C.), Summer 1985, pp. 85-105.

"Role NATO can play in the SDI programme, Jane's Defense Weekly, vol. 4, No.14, 5 October 1985, pp. 744-47.

Roper, J., "British nuclear deterrent and new developments in BMD" World Today (London) vol. 41, May 1985, pp.92-95.

Santis, Hugh De, "SDI and the European Allies: Riding the Tiger", Arms Control Today (Washington D.C.), vol. 16, No.2, March 1986, pp. 7-10

Santis, Hugh De., "Anti Tactical Missile Defense for Europe" SAIS Review (Maryland), vol. 6, No. 2, Summer 1986, pp.99-116.

"SDI and British Industry" Armed Forces Journal, vol. 5, No. 9, September 1986, pp. 418-420.

Seitz, Konrad, "SDI: The Technological Challenge for Europe", The World Today, August-September 1985, pp. 18-21.

Shapiro, Mark, "The Selling of Star Wars to Europe", New Statesman (London) vol. 115, No. 2965, 22 January 1988, pp. 18-21.

Sloam, Stanley R., "SDI and European Allies: Dazzled or Doubtful?" National Defense, (Illinois), vol. 69, No.41, May-June 1985, pp. 56-61.

Steward, Michael, "Britain, Europe and the Alliance", Foreign Affairs, July 1970, pp. 648-654.

Stourdze, "SDI-Eureka: A Complementary Defense" Defense and Armament Journal (London) December 1985, p. 22.

"Strategic Defence Initiative: British-United States Agreement on Research", Survey of Current Affairs (London), vol. 16, No. 1, January 1986, p. 9.

Takeshita, Lloyd S., "Strategic Defense Initiative and the NATO", Military Review (Fort Leavenworth K.S.), vol. 66, No. 4, April 1986, pp. 31-37.

Taylor, Trevor, "Britain's Response to the Strategic Defense Initiative" International Affairs, vol. 62, No.2, Spring 1986, pp. 217-30.

Taylor, Trevor, "Europe and SDI" RUSI Journal, vol.30, No.1, March 1985, pp. 40-45.

Thomson, James A., "The LRTNF Decision: Evolution of U.S. Theatre Nuclear Policy 1975-79", International Affairs, vol. 60, No.2, 1984, pp. 52-58.

"What are Soviets' Doing?" Time, vol. 127, No. 25, 23 June 1986, pp. 23.

"US Senate Bars Allies from most SDI participation", Strategic Digest (New Delhi), vol. XVII, No. 11, November 1987, p. 2216.

Wall, Patrick, "European view of SDI", Special Report Seapower (Arlington), vol. 29, No. 1, 3 January 1986, pp. 40-43.

Waton, Russell, Cullen, R.B., et. al., "At long last an Arms Deal", Newsweek, 28 September 1987, pp. 18-19.

Wells, Samuel F., "France and European Cooperation: Implications for U.S. Policy" Atlantic Community Quarterly, Fall 1985, pp. 379-388.

Wilentz, Amy, "Scientific Hurdles: From Sensors to Software, the needs are daunting" Time, vol. 127, No. 25, 23 June 1986, pp. 20-21.

Wiesner, J.B., "Arms Control: Current Prospect and Problems" Bulletin of the Atomic Scientists, May 1970, p. 7.

Worner, Manfred, "A missile defence for NATO Europe" Strategic Review, Winter 1986, pp. 14-20.

Yost, David S., "Ballistic Missile Defence and the Atlantic Alliance", International Security, vol. 7, No. 2, Fall 1982, pp. 145-152.

## YEAR BOOKS

International Institute for Strategic Studies (I.I.S.S.), The Military Balance (London: IISS, 1983-84, 1984-85, 1985-86, 1986-87).

International Institute for Strategic Studies (I.I.S.S.), Strategy Survey (London: IISS, 1983-87).

Royal United Services Institute, RUSI and Brassey's Defence Yearbook, 1986,( New York: Pergamon, 1986)

Stockholm International Peace Research Institute (SIPRI), World Armaments and Disarmament: SIPRI Yearbook,(Stockholm: Almquist Wiksell, 1983-87)

## NEWSPAPERS

ATLANTA JOURNAL AND CONSTITUTION (Chicago)

BALTIMORE SUN (Baltimore)

BOSTON GLOBE (Boston)

CHICAGO TRIBUNE (Chicago)

CHRISTIAN SCIENCE MONITOR (Boston)

DAILY TELEGRAPH (London)

FINANCIAL TIMES (London)

GUARDIAN'S WEEKLY (London)

INTERNATIONAL HERALD TRIBUNE (New York)

LOS ANGELES TIMES (Los Angeles)

NEW YORK TIMES (New York)

PHILADELPHIA INQUIRER (Philadelphia)

SEATTLE POST-INTELLIGENCER (Seattle)

TIMES (London)

TIMES OF INDIA (New Delhi)

WALL STREET JOURNAL (New York)

WASHINGTON POST (Washington D.C.)

WASHINGTON TIMES (Washington D.C.)