Star Wars and Countermeasures

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INTRODUCTION

During early 1980's, the U.S. planned to forge ahead in the ABM arena with a punch. Scientists thought about super advanced technologies involving lasers/ray/guns, neutral particle beams or projectiles etc that can be aimed through space at moving targets. The idea was conveyed to President Reagan by his friend-cum-adviser physicist Edward Teller who is often called as the father of the Hydrogen Bomb. Teller's idea moved Reagan so much that he formulated these notions of space based missile defensive system into a national policy-the "Strategic Defence Initiative (SDI)", somewhat on the similar lines as "the Manhattan Project" which developed the atom bomb. He came on the American TV to announce the new plan on 23 March, 1983 even to the surprise of many experts in his own government.

The salient features of the SDI, described by President Reagan as a non-nuclear research program, are to "Nullify the present and growing threat to the U.S and its allies which is posed by Soviet military power, replace the dangerous doctrine of mutual assured destruction (MAD) with a strategy of assured survival and provide both security and incentives for realising the enormous industrial and commercial potential of space." SDI plans to evolve new weapons (ABMs) - a system of satellites, space stations, lasers and the like in a decade or so to destroy the Soviet ICBMs before they can even reach the American soil and thus "rendering nuclear arms impotent and obsolete" - have been dubbed as the "Star-Wars", after the scientific fiction film by many indulging in fantasies. Filmmaker George Lucas, Creator of the scientific fiction trilogy, "Star Wars" had also threatened to go to court with a charge for copyright infringement. A new name for SDI has, therefore, been suggested as "Peace Shield". Scientists and defence experts, however, feel that such a system cannot be hundred per cent effective. Majority of Pentagon scientists also agreed that SDI would be "dangerously unreliable" because the system as a whole could never be adequately tested. The office of the Technology Assessment (closely linked with the U.S. Congress) in their report brought out that defence of the U.S population does not "appear to be a goal of the SDI program" because the system is unlikely to be totally reliable against all types of Soviet attacks. In other words, even one per cent ineffectiveness may spell disaster and render it totally useless. 100 per cent guarantee or none at all - there possibly would not be any runners-up in a nuclear war!

"Star Wars" is an American dream of total safety against all incoming missiles and MIRVS-complete elimination of nuclear weapons aimed to destroy

the USA. Star-wars will have layered defence - it is to be designed to kill all enemy targets during various phases of their flight. The boost phase is obviously the much sought after one, because during these 3 to 5 minutes launch period, any strike is expected to have a high probability of kill as upto ten warheads are still clustered atop the ballistic missile. After this phase is over, the ICBM ejects a "bus" which holds the warheads alongwith decoys. These warheads then spread to different trajectories and then they become extremely difficult to be spotted for kills. The last phase is when these warheads re-enter the atmosphere and all decoys are spent out. Ground based weapons can, if luck favours, shoot them down at this stage. But then, it is not free from nuclear radiation effects. In 1984, exercises were successfully carried out to kill an incoming Minuteman missile during this last phase. President Bush is also committed to "Star Wars" programme.

ANCIENT INDIAN STAR-WARS

Ancient Indian Sanskrit literature talked about battles between rival satellites and use of ray-beams to destroy them. Even descriptions of battle victims reminiscent of accounts of what happened after the atom bomb was dropped in Hiroshima are there and these have recently been translated in German and English. We have wished away all these as fantasy. But studies by Erich Von Daniken of Switzerland brought out in 1970 in a publication titled, Chariots of the Gods" and in 1985 another of his latest book, "Did I get it Wrong" (Published in German) evoked keen interest world-over. According to these published works, Star-Wars is not just a future dream - it actually happened thousands of years ago. Gigantic space satellites, made of shiny metal and turning about an axis operated between Stars and fought Sky Battles between aliens! Smaller Crafts used to fly between the giant space stations and the Earth.

IMPLEMENTATION OF "STAR-WARS" PROGRAMME

The implementation of the "Star Wars Project" has been entrusted to SDI Director, Lt Gen James Abraham of the U.S. Air Force. He has since resigned from this job end 1988. Initial estimates of cost over a period of 5 years till 1988 were 26 billion dollars which may exceed much beyond this. What form of hardware is to be used is still largely being discussed and analysed. Government agencies and mostly private Aero-space industries are on the job to develop systems that could "detect, identify, discriminate, intercept and destroy ballistic missiles". Whether lasers or other beams are to be used is still to be decided. Even whether these beams will be ground-based or satellite-based has also not been decided finally. The preference, however, seems to be towards space-based

laser beams. Ground based beams can be countered easily by reflecting mirrors in space. It will take some more years before definite answers could be given. President Reagan himself said, "I think that would be way ahead of ourselves. We don't know what kind of weapon, if we were able to come up with one, that this would be".

Nevertheless Research is being continued to find the ultimate weapons. Even if it never produces a deployable space weapon system, technological breakthrough will usher in new ideas. The Soviets are also in the game and it is to be seen how they counter the SDI program.

POWER SOURCE FOR BULKY SPACE LASER-STATIONS

Production of Lasers requires lot of energy. Any space based laser system would require a very high source of energy fuels. For deployment of Star War Laser systems, the rough estimate is that energy fuel equivalent of what is required to generate 60 per cent of total of the U.S. electricity would have to be catered to the space.

According to the journal "Science", the U.S. department of energy has already sought the approval of the U.S. congress to build a nuclear reactor, type SP-100, to be ready after all required tests for launching into space aboard a space shuttle by 1993. This will generate electric power upto 300 KW for the SDI program in space and will thus become the "Corner-Stone" power source for the entire Star-Wars efforts. Earlier in 1965, the first ever successful nuclear reactor launched by the U.S. for her "Skylab" missions had developed defects only after a few months, even though it is still orbiting the earth. The success of such powerful nuclear reactors, as SP-100 is, therefore, viewed with lot of concern. SP-100 will be fuelled by highly enriched Uranium-235, operate at 1,000°C and be cooled by liquid Lithium.

LASER-BASED APPLICATIONS

While investigating global geo-physical changes, Scientists have concluded that the Earth's surface is constantly shifting-imperceptibly perhaps, but shifting all the same. Thus, the present configuration compared to that of the past is different, so will the future configuration be. This shift can be measured by putting special geodesic satellites up in the space and bouncing special type of high powered Laser beams off them. By measuring the travel time of the laser beams back and forth, minute movements of the earth's crust can be found out.

Laser has now found it's applications in data storage, be it for music discs or discs for computer memory-the CD (compact Disc, as it is called) revolution

is about to sweep the computer industry. The storage capacity of a 4.7 inch plastic CD is more than that of 1500 floppy discs or 50 Winchester hard discs-this huge capacity of about 500 megabytes can easily contain an entire encyclopedia. These will all find extensive use in the "Star Wars" program.

ARMS LIMITATION OR TOTAL DISARMAMENT-NEW DIMENSIONS

It is realised that our future lies in nuclear disarmament and not in nuclear build-up. All the castles of happiness and progress created all over this world of ours may crush down like a pack of cards in the event of a nuclear holocaust. While unabated nuclear build up is going on todate, all the powers are also talking about peace and nuclear disarmament simultaneously for many years now. In 1959, the Soviet Premier Krushchev had launched a proposal for general and complete disarmament-the elimination of all conventional and nuclear weapons over a period of four years. After two years of serious deliberations, America agreed to the proposal with a structured and technically detailed disarmament plan. However, during concentrated negotiations both superpowers realised to their utter dismay that complete disarmament was not a practical solution at all! This idea was again revived by the new Soviet Premier Gorbachev in recent times. He offered 50 per cent cut in strategic nuclear missiles, withdrawal of some SS-20s and a freeze on new strategic systems. He also desired a chemical-weapon free Europe and urged action to stop proliferation of chemical arms. Gorbachev has further proposed elimination of nuclear weapons from the earth by the year 2,000. He feels that the growing public opinion against arms race will ultimately eliminate all military arsenals from the face of the world. The Soviet leader has already proposed significant mutual reductions in land and tactical airforces for NATO and Warsaw pact countries and also conventional arms reduction. Both President Reagan and the Soviet leader Gorbachev declared again that neither of them would be the first to threaten a nuclear war. Earlier in 1985, the Soviets had unilaterally put a moratorium on nuclear testing and asked the Americans to follow suite. Despite no response from them, once again in the wake of the Chernobyl disaster, Soviets unilaterally extended the moratorium till August 6 which marks the 40th anniversary of the dropping of the Bomb at Hiroshima.

The recent signing of the INF Treaty between the superpowers has ushered in new hopes. Actual destruction of missiles under this treaty is now going on much within the public gaze. What a change!

RELIABILITY OF SPACE MISSIONS

For well over a decade, American spy satellites flew over the USSR and in 1978 the U.S. admitted it. Space shuttle Discovery's Mission 51-C also lifted off

from Florida's Kennedy Space Centre with a military intelligence satellite, placed to a geosynchronous orbit 22,300 miles above the equater. This will help to verify future arms control agreements by providing information on Soviet missile forces by monitoring a broad spectrum of Soviet electronic transmissions including broadcasts communications, some telephone conversations and telemetry from Soviet missile tests. Already about 14 missions of space shuttle are booked for the military and the U.S. airforce has built its own secret launching pad in California for military shuttles for use in October '85. On 01 April, 1986, a Tomahawk cruise missile fired from a submerged submarine 650 km off the California Coast homed onto its target, an aircraft in a concrete revetment on San Clement Island. The aircraft became a spectacular fireball and disintegrated.

Despite the above, the early 1986 saw quite a few major American disasters in space. On Jan 28, seven U.S. astronauts had died aboard the Challenger space shuttle as it exploded 72 seconds after take-off from Cape Canaveral. On 18 April, a USAF Titan rocket, allegedly carrying a spy satellite into orbit exploded shortly after launch. On 3rd May, the unmanned Delta rocket went out of control moments after lifting from Cape Canaveral and it was promptly blown up merely 91 seconds after take off. All these form the main stay of SDI programme and those failures are bound to lower its credibility. The failure of the European "Ariane" satellite launcher in May '86 further revealed that a fault-proof space device is yet to come.

SPACE SUPERIORITY-IS THE USSR AHEAD OF THE US?

Moscow has already carried out trials for its space shuttle which was guided back to a splashdown in the Black sea in December '84. Mr R Turnill, Editor of the authoritative Jane's "Space Flight Directory, 1986" clearly brings out the Soviet superiority in space programme and says that, "The Soviet lead in space is now almost frightening" - in that the USSR has taken a 10 year lead over the US and they are far ahead of the Americans "that they are almost out of sight". The Soviet astronauts have acquired great experience in space having clocked up more than 4,000 days in space as compared to only 1587 days by Americans, that too largely based on short flights of about 3 days at a time. The Challenger Space Shuttle disaster has shown many American weaknesses, even no contingency plans for space programme in case of an accident was ready at NASA.

NUCLEAR ANNIHILATION-LESSONS FROM THE CHERNOBYL DISASTER

April 26, 1986 saw a major accident at the Chernobyl nuclear power plant and realisation came in its wake that "a sinister force as nuclear energy has escaped control". The extraordinary and dangerous nature of the after effects of the

accidents were in no way comparable to that of an earlier nuclear accident at the Three Miles Island in USA in 1979. Radiation fallouts spread over to other countries upto 1600 Kms, polluting the environment. The radiation situation on the ground, surface, on water, and in the atmosphere is being monitored constantly. It became clear that nuclear threats as a result of even an accidental deployment will really have no confined boundaries of destruction - it would be an international disaster. While the real losses suffered and the impact of it for years to come is still to be realised, the main lesson to learn from the Chernobyl incident is to press on for nuclear test ban and nuclear weapon elimination. If a disaster of this magnitude could occur from the energy of the atom in a controlled plant, it is for anyone to surmise the possible consequences from uncontrolled mass destruction by this energy when nuclear weapons are deployed. "The accident at Chernobyl showed that an abyss will open if nuclear war befalls mankind. For inherent in the nuclear arsenals stockpiled are thousands upon thousands of disasters far more horrible than the Chernobyl one" - said Mikhail Gorbachev in a Moscow TV address on May 14, 1986, displaying Soviet concern over the possibility of a nuclear disaster, whether from nuclear power plant or from nuclear weapons. An international conference on nuclear safety was also held recently.

SOVIET COUNTERMEASURES TO "STAR WARS"

So to counter SDI program, the Soviets instead of copying it may go for a highly offensive system that would allow them to kill the US system or even to penetrate any defense the US erects. Soviet scientists in a special study report "Large scale antimissile systems and international security", have said that the American SDI programme is incapable of ensuring reliable protection from a retaliation and that laser stations in orbit can be destroyed quite easily. Various counter measures thought about are as follows:-

(a) The SDI stations in space are likely to be bigger than the ballistic missiles. Thus these big targets (fewer in number in outer space) can be easily aimed at carefully without any hurry as they would remain in the field of vision for a long time. Satellites filled with explosives can be sent into parallel orbits and blown up when closeby on ground commands or ground/space based laser beams can be directed to destroy them. These beams need not even be highly powerful as over a prolonged time even less powerful beams can cause enough damage to put them off.

(b) The Soviets are also thinking of developing small sized missiles with different basing modes and high thrust loading. Since SDI laser-stations are being designed for destroying strategic ballistic missiles, these stations, the Soviets say, will prove virtually ineffective against the smaller missiles.

(c) A particle of 30 gms moving at a speed of 15 Km per second can pierce a steel shell 15 Cm thick. It is not possible to protect a SDI space station from continuous bombardment of small particles at high speed.

(d) Even a small damage or a breach in the defence could be enough to make the system totally useless against 100 per cent defence. It is not required to totally destroy the platform, even a component failure could be catastrophic.

(e) Reluctantly upgrade and build up strategic arsenal even though these are violative of SALT treaties.

The US Scientists said that "STAR WARS" will not be the end of the arms race because of Soviet countermeasures envisaged. New countermeasures would follow and the race would go on and become more and more dangerous.

UPDATED SDI

The three year old concept of SDI has already undergone many changes and a "total conceptual change" is likely. Lt Gen James Abraham, Ex-Director of SDI organisation visualised development and deployment of a series of updated weapons in space to stay ahead of the Soviet efforts to penetrate the shield. A decision in the 1990's is likely to deploy several hundred satellite carriers with thousands of small rockets intended to strike incoming Soviet missiles. The SDI plan will no longer be only an "astrodome" shield to kill all incoming missiles. Now it has further been proposed to develop dual purpose weapons that could be used on both conventional and nuclear weapons with the insertion of a "Clip-on" nuclear warhead for applications on Navy Torpedoes and Army missiles. This will effect verification of SALT-II provisions since conventional and nuclear weapons would look alike.

Reports say that the US is developing new varieties of third generation nuclear weapons. The new technology called "Nuclear Powered Directed-Energy Weapons (NDEWS)" will also find use in the SDI program and will possibly be deployed to destroy missiles, attack satellites, incapacitate mobile missiles on the ground or even disrupt enemy communications. NDEWS produce stepped up type of energy in each explosion-be it X-rays, Gamma rays or micro-waves and the energy can be focussed on to a distant target. It is said that their testing is imminent and that is why the US is opposing any test ban in near future.

There is even a programme to develop a vehicle that could snatch satellites from high orbits and bring them into the space shuttle.

FIRST STRIKE CAPABILITY AND ADVANTAGES THERE-OF

The US Technology Assessment office has brought out in its report that if the defence systems themselves are vulnerable to a pre-emptive attack, it gives an advantage to the side that strikes first. If both the superpowers have similar limited defences, there is in fact an incentive for either side to strike first because the "ragged response" of the other side may be less damaging. These are all guesses-what will actually happen to the mankind at large is rather uncertain. Once weapons are developed and tested, their deployment will follow today or tomorrow. Hence the crucial factor is that there must be some agreement on stopping research and tests on further developments e.g space weapons. The future, therefore, depends on successful elimination of nuclear weapons because it "can really rob all mankind of its future", said Mr Gorbachev. He further wrote, "The evergrowing arsenal of reason and goodwill, the arsenal of peace, replenished by the aspirations of millions, is capable of eliminating military arsenals that threaten humanity". He concluded, "the future does not appear to me to be a silent and dark figure grimly and fatally looming up". It appears that deterrence is as much a state of mind as anything else. The usual method of measuring a nation's military capabilities by asking whether it can win a war against its potential adversary is really not applicable in the nuclear warfare. It is, therefore, more difficult to assess as to who is ahead of the other in the power game of the two superpowers. Numbers alone also cannot be blindly compared, Scientists think that a mere one per cent of the nuclear arsenal would be enough to cause a global "nuclear winter", a term coined by American atmosphere scientist Mr Richard Turco. It may block the sun by a thick dark cloud of smoke from raging fires and temperatures may plunge far below freezing-predicts a computer model analysis.

CONCLUSION

The arms race has intensified and after spending billions and billions of dollars and all the scientific and strategic developments, we may find that we have only bought greater instability than the world has ever faced todate. Instead of peace and happiness, are we not heading towards war and sorrow? There will be no boundary line of these in a nuclear holocaust. No one knows who will survive. Peace and freedom have their price. He who has rights and powers also has duties to perform. Every one talks about peace. Only comprehensive disarmament can render military means of securing peace unnecessary. Till then, may be the present concept of deterrance will reamin as the only corner-stone for survival of the mankind. Like we have built up the arsenals of this world todate, we can also reduce it now onwards by patient and careful arms control efforts and by a dedication for peace alone. Unilateral disarmament for a short duration may be

OK, but nobody who holds political responsibility can really do so for a longer duration since it jeopardizes the security of the country. Today world peace is threatened not only by nuclear weapons but also by international terrorism, poverty, hunger and deaths in various parts of the world.