

U.S.S.R. have to keep their own defense system invulnerable against any type of attack, or eliminate completely offensive nuclear weapons. Typical survival techniques for a defense system include 1) hardening, 2) distancing the system from its potential attackers, 3) making them maneuverable to evade attack, and 4) proliferating the defense with more satellites.<sup>135</sup> However, these measures are very demanding in terms of technique and cost, and might not be successful.<sup>136</sup> Thus the two countries will eventually be compelled to conclude that the only effective way to keep the defense system survivable is to attack the other side's defense. This would put the two countries on the track for acquiring disarming first-strike capability in a space war--again creating crisis and arms race instabilities. The complete elimination of offensive nuclear forces is simply impossible, for each country would have to maintain retaliatory forces for an unforeseen result of the aforementioned defensive weapons competition.

#### **Prospects for U.S. Extended Nuclear Deterrence Under a Defense Dominated World**

What then, would become of U.S. extended nuclear deterrence in this defensive-based world? First and fundamentally, defensive deterrent, or deterrence by denial, is less appropriate for the policy of deterrence than deterrence by retaliation.<sup>137</sup> This is because defense can affect the success or failure of an adversary's military adventure alone and nothing more. Deterrence by retaliation, or deterrence by punishment, will affect more than

such a policy outcome: it is a matter of life or death. Thus even if the implementation probability of such retaliation were low, the deterrent power generated by punishment would be much stronger.

Second, if the Soviet Union should become invulnerable to a U.S. nuclear attack, it would become more risk-taking and provocative around the world. We can presume this tendency through a brief review of U.S. foreign policy. From 1945 to 1963, the U.S. enjoyed a nuclear monopoly or maintained a dominant nuclear capability vis-a-vis the Soviet Union. During these nineteen years, in conducting its foreign policy, the U.S. sent seventeen implicit or explicit strategic nuclear "signals" or threats to the Soviet Union and other antagonists affiliated to it.<sup>138</sup> But from 1964 to 1973, during which the U.S.S.R. steadily increased its retaliatory nuclear power, only two such cases were observed.<sup>139</sup> And since 1974, under nuclear interdependence characterized as MAD, there have been no signals.<sup>140</sup> The more the U.S. became vulnerable to Soviet nuclear attack, the more reluctant the U.S. became to use nuclear threats in support of its foreign policy. These empirical facts suggest to us that the Soviet Union would actually become more adventurous once it became invulnerable to U.S. nuclear attack, and vice versa.

Similarly, the fact that the Soviet Union would no longer fear escalation to nuclear war would make the Soviets more willing to use conventional means against U.S. allies. This tendency would be increased should SDI draw efforts away from conventional force improvements that are in the mainstream of U.S. allies'

security interests. The sheer expense of actual SDI deployments might force the U.S. to sharply reduce outlays for conventional forces.<sup>141</sup> The possible curtailment of U.S. forces stationed in its allies' territory, whose stationing is one of the visible embodiments of the U.S. security commitment, would have an adverse effect on U.S. extended deterrence.

Third, the prospect of two-sided defense shields might affect NATO's strategy of flexible response. By deploying a multi-layered defense shield, the U.S. would in theory be less susceptible to attacks on its ICBMs that are planned to be employed for selective response options. But the Soviet defense shield would compel the U.S. to use larger numbers of missiles, thereby endangering flexibility.<sup>142</sup>

Of greater consequence would be the situation whereby defense shields deployed by the U.S. and the U.S.S.R. are highly effective, whereas those for non-nuclear U.S. allies are less effective. Such a situation is plausible in view of the fact that the non-nuclear U.S. allies both in Europe and East Asia lack defense depth vis-a-vis the Soviet Union (The Soviets would have the same problem against the nuclear missiles of the P.R.C., the U.K., and France). Flight times of land-based Soviet delivery vehicles to these U.S. allies are shorter, so that there would be less opportunity to intercept them en route. Terminal defense would thus be the only realistic defense shield for these allies. Expecting a near-perfect defense by terminal defense alone, however, seems to be a mirage. This prospect conjures up the vision of a nuclear war limited to the theater level and decoupled

from strategic nuclear war. U.S. extended nuclear deterrence here would virtually cease to be credible. Thus, unless the U.S. and its allies developed a highly effective terminal defense, which would also be indispensable for the U.S. in view of the Soviet low trajectory SLEMs that could be stationed off the U.S. coasts, a mutually defense dominated posture would not provide U.S. allies with a safer world.

### SDI As a Point Defense

As noted earlier, force requirements for a near-perfect nationwide defense shield are formidable. Although forecasting the net effect of technology is risky and major breakthroughs could change the way we look at problems, there is at present little reason to believe that a defense shield that satisfies all those requirements would be ready for deployment in the next decade or so. Many years of work and tremendous costs lie ahead. Basically, SDI's R & D for leak-proof comprehensive defense is a very long-term project whose outcome is uncertain at best.

On the other hand, the U.S. at present faces pressing strategic problems such as ongoing Soviet reinforcement of its strategic defense,<sup>143</sup> vulnerability of U.S. strategic C<sup>3</sup>I assets and diminishing survivability of U.S. ICBM forces. If SDI's R & D were geared to aiming at solutions to these problems, SDI can contribute considerably. First, R & D on SDI can respond to the steady Soviet ballistic missile defense (BMD) efforts by providing a deterrent to any Soviet decision to withdraw from the Anti-ballistic Missile Treaty (ABM Treaty) and by creating a hedge

against Soviet breakthroughs in BMD technology.<sup>144</sup> In fact the Reagan Administration has enumerated this as a short-term objective of SDI.<sup>145</sup> However, it is reported that SDI's focus is mainly on exotic technology and that SDI as it is now constituted is really not suited to this objective.<sup>146</sup> Putting a priority on these would mislead the Soviets into thinking that the U.S. was locked in on a crash program of total population defense systems, thereby prompting, rather than checking, near-term expansion of Soviet defense systems as well as offensive forces.

Second, the results of SDI's R & D can be applicable to the protection of U.S. retaliatory forces and critical C<sup>3</sup>I facilities. Defending these important military assets is strategically sound as a device for strengthening strategic nuclear stability. The U.S. ICBM force and strategic command and control centers are the focus of this situation. U.S. ICBMs have prompt hard-target kill capability, but their survivability has been gradually eroded by the improvement of Soviet counterparts. Eventually, they might fall into a "use them or lose them" category. Providing U.S. ICBMs with a defense shield, within the constraints of an offensive arms control agreement that keep Soviet ICBM warheads beneath the level at which the shield would be overwhelmed, will not only ensure their survivability, but also will decrease Soviet incentives to first strike in a crisis. The outcome of SDI's R & D would make this accomplishment easy, should such protection become necessary.<sup>147</sup> Strategic C<sup>3</sup>I centers will also profit from BMD defense, although the benefit would be less than that of the

ICBMs because their relatively small numbers would allow the attacker to employ many warheads on each.<sup>148</sup> In this way, a certain measure of protection for strategic forces and command centers enhances strategic stability by improving the survivability of second-strike forces, thus gaining time for controlled reaction in case of crisis and war. Stabilizing U.S.-Soviet mutual deterrence in itself helps lead to easing of East-West relations, which is no doubt conducive to the security of U.S. allies themselves.

President Reagan's vision of protecting populations and eventually eliminating nuclear weapons is, in itself, desirable, morally appealing, and consistent with the human instinct to develop measures against persistent threat and fear. To achieve this feat, however, requires time and money. Furthermore, even if a defensive-based world were created, it would not necessarily be more stable and safer than the one we have today.

In a more fundamental sense, it is questionable to rely heavily on technology in eliminating the nuclear threat. Antagonism or rivalry is political in its origins and can be alleviated or resolved primarily by political action. Even though technology is clearly an important factor in issues of international stability, technology per se cannot bring about lasting peace. Even an ardent advocate of SDI declares that he and other SDI supporters as well are under no illusions about the limitations of "technological peace."<sup>149</sup> A U.S. policy of "go-it-alone" with the SDI program will inescapably invite Soviet countermeasures, which, in turn, would make the project tougher to

realize. To attain a defense shield that negates nuclear threat, Soviet understanding and cooperation, for example toward a drastic reduction of offensive forces, are absolute prerequisites, in addition to advanced technology. However, given the fundamental mistrust between the U.S. and the Soviet Union, this writer is unable to comprehend how and why either country could engage in such cooperation. Moreover, if U.S.-Soviet relations should grow into such cooperative and friendly ones, do we really need a comprehensive defense shield such as SDI?

This criticism of the SDI program thus far does not mean that SDI project should be scrapped. As suggested, there are at least two good near-term reasons to carry out SDI's R & D in the current situation of U.S.-Soviet rivalry: to hedge against Soviet technological breakthroughs in defense and to have a clearer idea concerning the options for point defense of important military assets. In the long-term, too, proceeding with R & D on SDI is valuable: possible scientific and technological innovation of SDI's R & D will provide spin-offs for sophisticated conventional weapons and non-military high technology fields.<sup>150</sup> The point, however, is that without certain U.S.-Soviet political understanding, it is impractical and risky to plunge forward toward the SDI's long-term objective of highly effective population defense. It is impractical since, whatever exotic technology the SDI program invents and utilizes, a leak-proof defense is unlikely to come about because of Soviet countermeasures. SDI under the current U.S.-Soviet rivalry is risky, because the visualized total

defense, irrespective of its effectiveness, might destabilize U.S.-Soviet nuclear relations.

**CONCLUSION: MEANS FOR MAINTAINING THE CREDIBILITY OF THE U.S.  
NUCLEAR UMBRELLA**

A two track policy is necessary for the maintenance of credible U.S. extended nuclear deterrence. One track is to implement measures against outbreak of nuclear war between the U.S. and the Soviet Union.<sup>151</sup> The other track is to strengthen the ties between the U.S. and its allies in order to prevent the Soviets from misunderstanding American nuclear commitment.

**Measures Against an Outbreak of Nuclear War**

For the first track, there are three broad policy dimensions:

1) the pursuit of a balanced policy between the maintenance of a credible U.S. nuclear deterrent power and stable U.S.-Soviet mutual deterrence, 2) the maintenance of regional conventional military balance vis-a-vis the Soviet Union, and 3) lowering the risk of losing control over nuclear weapons. The last category of policy efforts is no less important, since nuclear war could result not only from calculation but also from inadvertence and accident.

The U.S. strategic debate of the late 1970s and 1980s has seen a basic division between those who stress the "existentialist" nature of nuclear deterrence and those who



believe that nuclear deterrence is ultimately based on the ability to deny the Soviets the prospect of gain and to threaten destruction of high value targets in retaliation. For the former, the knowledge of the possibility of mutual suicide at the end of a process of escalation is sufficient for deterrence. The mere existence of nuclear weapons that could destroy the Soviet society provides the hard core of deterrence. Indeed, as Michael Howard once put it, "[S]ociety may have accepted killing as a legitimate instrument of state policy, but not, as yet, suicide."<sup>152</sup>

For the latter, the existential suicidal threat alone is not sufficient for a credible deterrence, extended deterrence in particular. The effectiveness of deterrence depends on Soviet perceptions and calculations of relative nuclear capabilities of the U.S. and the Soviet Union. Thus, to this school, powerful and superior damage-limiting capability for escalation dominance is the essential element for credible deterrence. The better the damage-limitation of the United States, the more it can withstand a retaliatory attack and, hence, the more credible the threat to use nuclear weapons becomes.

Each of the two has its own persuasiveness. However, the extreme case of each tenet contains serious danger. For the former, it risks Soviet misunderstanding concerning U.S. resolve to the commitment to the security of its allies through nuclear deterrence. For the latter, limitless pursuance of damage-limitation, either by prompt hard-target counterforce capability or nation-wide defensive measures, is destabilizing for U.S.-Soviet mutual deterrence and would even be perceived as a first-

strike threat. In this case, threats that are intended to deter may instead provoke. Thus, policy orientation should be a balanced deterrence, not simply deterrence by existential suicidal threat or by increased threats. The latter should complement the former, up to the point short of destabilizing the U.S.-Soviet mutual deterrence.

Several important measures for the above policy direction can be put forth. The U.S. strategic triad (ICBMs, SLBMs and long-range bombers including those carrying ALCMs) should be modernized as necessary to ensure that an adequate proportion would survive attack and be able to penetrate Soviet defenses. The maintenance of a diverse and redundant retaliatory force is important, since their collective ability to survive attack and penetrate defenses is greater than that of each component in isolation. For this reason, U.S. ICBM forces should be maintained. If this component of the triad were to be eliminated, it would give the Soviets the opportunity to concentrate their efforts on anti-air and anti-submarine technologies, which could place long-range bombers and SLBMs in jeopardy much easier than would be the case under the more diversified triad system.

In parallel with this, it is necessary to expend further efforts on some other measures including arms control, for the stabilization of U.S.-Soviet mutual deterrence. These include, firstly, establishment of measures to solve the theoretical vulnerability of the U.S. ICBM force. One step would be to negotiate a shift of U.S. and Soviet ICBM forces from MIRVed missiles to single-warhead missiles. Symmetrical numbers between

launchers and warheads, along with an adequate basing mode, would ensure the survivability of ICBM forces as well as enhance crisis stability. Soviet acceptance of single-warhead ICBM forces would be unlikely in view of its heavy dependence on ICBMs in the composition of its overall strategic forces. However, as a long-term policy objective, this concept should be maintained. The other strategically sound choice would be deployment of multi-layered defense for point defense of the U.S. ICBM force. However, this is a politically complicated option since it would risk giving rise to public pressure to extend deployment to encompass nation-wide defense, an option about which the feasibility is questioned on technical and strategic grounds.

The second is a ban or limit on deployment of anti-satellite weapon systems--especially high-altitude anti-satellite systems that threaten ballistic missile early warning satellites and communication satellites. Unrestrained development and deployment of anti-satellite systems by the U.S. and the Soviet Union would erode each side's confidence that it would receive adequate warning of attack and be able to communicate with retaliatory forces, thereby lowering crisis stability.

The third is the conclusion of the Comprehensive Test Ban Treaty that allows only the minimum nuclear testing. Tightened limits on nuclear testing would constrain development of newer and potentially more destabilizing weapons.

Fourth, while there are reports that SSBM forces have been shifted away from close proximity to each side targets, the issue of close proximity strategic forces still needs to be addressed

and agreed upon in the context of arms control negotiations. Close proximity strategic forces present at least two destabilizing factors. One is short-time of flight and therefore very limited reaction time, and the other is the potential for depressed trajectory launches which can complicate detection systems.

In the current condition of essential equivalence of U.S.-Soviet strategic nuclear forces, a conventional war is the most likely path to nuclear war rather than by direct nuclear threat. In that sense, successful deterrence of conventional war would be tantamount to the success of deterrence of nuclear war. Moreover, in terms of contribution to deterrence, conventional buildup would be more helpful, since threats to use conventional forces are more credible than threats to use nuclear weapons. If the Soviet Union employs its conventional forces against major U.S. allies under the condition of U.S.-Soviet strategic parity, it is likely to be only when a quick conventional victory or fait accompli seems possible. Thus, it is crucial for U.S. allies, with the assistance of the United States, to maintain a favorable, or at least not too unfavorable, immediate and short-term regional conventional military balance vis-a-vis the Soviet Union to prevent it from achieving such a quick result.<sup>153</sup>

An important caution, however, might be necessary in the buildup of conventional forces: be wary of the danger of provoking the Soviets. A powerful offensive force posture and strategy, whether based on advanced conventional technologies or on the deployment of provocative theater nuclear forces, could

increase the risk of theater nuclear war by provoking Soviet preemption or by lowering the Soviet nuclear conflict threshold. Deterrent threats communicated by military forces often tend to be perceived as compellence. Threats perceived as compellent usually breed resentment, rejection and irrational conduct.<sup>154</sup>

Inadvertent or accidental nuclear launch is no less a major cause of nuclear war than large-scale conventional war. First, a policy of launch-on-warning or launch-under-attack seems to be an easy solution to the vulnerability problem of U.S. ICBMs. But in view of dangers of accidental or unauthorized launch inherent in this option, the U.S. should not adopt these options for the remedy of the ICBM vulnerability problem as operational policy. Second, some categories of battlefield nuclear weapons would prove difficult to control centrally if conflict should arise. They pose a real danger of accidental or unauthorized use in the "fog of war." This danger is especially serious in Europe where sizable tactical nuclear weapons are deployed along the border in Central Europe. Conventional weapons with advanced technologies, probably derived from the on-going SDI research, can replace the battlefield nuclear weapons. Third, safety devices and procedures including permission action links for the sea-based nuclear forces including SLCMs should be improved. An encouraging recent development in reducing the danger of accidental nuclear war is the U.S.-Soviet agreement of September 1987 for establishing Nuclear Risk Reduction Centers in each national capital as a mechanism to avoid nuclear incidents during periods of tension.<sup>155</sup> Further dialogue and communications between the two

countries would decrease the dangers of accidental and unauthorized nuclear launch.

### **Strengthening of Ties Between the U.S. and Its Allies**

For the second track, the strengthening of ties between the U.S. and its allies, necessary measures vary due to the essentially contextual nature of the U.S. nuclear umbrella. The geo-strategic environment in which U.S. allies are located largely decides the function of U.S. extended nuclear deterrence. In the case of Japan, compared with the West European situation, nuclear conflict threshold is higher but the U.S. nuclear umbrella is perceived as less credible. The nuclear threshold is higher because the Northeast Asian strategic environment is essentially maritime in nature, and the combined U.S. and Japanese conventional sea and air capability is not in as adverse a deterrent posture vis-a-vis the Soviet Union, as in the case in Europe where Western Europe and U.S. forces face overwhelming numbers of Soviet conventional ground forces. The U.S. nuclear umbrella appears less credible to Japan since U.S.-Japan relations, again compared with U.S.-West European relations, do not enjoy comparable mutual sympathy, loyalty, and "we feeling" based on cultural, historical, religious, and ethnic identity.

Against this backdrop, several policy directions on the part of Japan can be put forth. In the military dimension, besides closer U.S.-Japan military cooperation, Japan's stepped-up conventional military buildup, sea and air capability in particular, is crucial. U.S. sea and air power in the Far East is

primarily derived from the U.S. Seventh Fleet, the power of which in terms of consistent capability is not permanently operated in the Japanese defense region. The Seventh Fleet is responsible for providing maritime capability in support of U.S. national objectives throughout the Western Pacific, Indian Ocean and Southwest Asian maritime area. The outbreak of military conflict in the Middle East might bring about a power vacuum in Northeast Asia. In such a case Japan will have to deal with the initial stage of a Soviet adventure almost on its own, until additional U.S. forces arrive. In this sense, the maintenance of a sea and air balance between a combined U.S.-Japan capability and the Soviet capability alone would not be sufficient. Japan must prepare maritime and air forces to a level which would enable it to deal with Soviet naval and air operations in Northeast Asia with only limited U.S. support. Japan's continuing abstinence from procurement of offensive weapons can be designed to hold the potentially provocative nature of such a defense to a minimum, domestically and regionally. Japan's GNP is now comparable to that of the Soviet Union. Insufficient resources and budgetary constraints are not a plausible excuse for constraining the development of a legitimate defense, if Japan wants to keep the nuclear threshold high. Moreover, aside from the American willingness to defend Japan against actual Soviet invasion, the strategic importance of the Japanese archipelago to the U.S. (and therefore the importance to the Soviet Union as well) may not in and of itself be very helpful in the extended deterrence, since the greater the strategic value of Japan, the higher the costs and

the greater the risks the Soviet Union will presumably be ready to accept in order to control Japan.<sup>156</sup>

Finally, the non-military dimension is no less important than the military dimension, since the function of extended nuclear deterrence is political as well. An important empirical study shows that "successful extended deterrence is very much more than just a matter of having a favorable military balance, and very much a matter of the nature and extent of ties between the defender state and the state it wishes to protect."<sup>157</sup> Political cooperation and economic interdependence between the U.S. and Japan would make the U.S. nuclear commitment more believable in terms of Soviet perception, since this would increase American stakes and interests in U.S.-Japan relations. Political and economic disputes, such as the current trade dispute, can damage U.S.-Japan cohesion and reduce the credibility of the U.S. nuclear umbrella by fueling Soviet misunderstanding of it. Last, bonds of mutual identification, which are more important for the success of extended deterrence than particular indices of political, economic, and military cooperations would be promoted by close communications and attention.

Specifically, the U.S. and Japan must search for as many common points as are evident in their mutual global outlook, and then build a strategy on these which is believable to all parties in the puzzle of global stability in the coming age.



## GLOSSARY

**Anti-ballistic Missile (ABM):** A missile weapon for destroying attacking ballistic missiles. The system includes radars for target acquisition, missile guidance, and weapons targeting.

**Anti-satellite weapon (ASAT):** A system designed to destroy or disrupt the operation of an adversary's satellite.

**Assured destruction capability:** The capacity to absorb the total weight of an enemy's nuclear strike and retain the capability to launch an attack in a response that would inflict unacceptable damage on the aggressor.

**Atomic demolition munition (ADM):** A nuclear device designed to be emplaced and detonated on or below the ground, or under water; also called a nuclear land mine.

**Ballistic Missile Defense (BMD):** A complex of radars, launchers, weapons, target acquisition, and missile guidance for the detection and destruction of ballistic missiles in flight. The many different proposed weapons systems include intercepting rockets, laser or particle beams, and debris thrown up by nuclear explosions.

**Circular Error Probable (CEP):** A measure of the accuracy attributable to ballistic missiles. It is the radius of circle into which 50 percent of the warheads aimed at the center of the circle are predicted to fall.

**Counterforce:** Military plans or weapons directed against an opponent's military forces.

**Countervalue:** Military plans or weapons directed against an opponent's civilian and economic centers.

**Crisis stability:** Confidence shared by adversaries in a crisis that neither side could gain a decisive advantage by using nuclear weapons first; results primarily from the possession by both sides of survivable, secure retaliatory nuclear forces; reduces incentive for a preemptive strike.

**Cruise missile:** A slow-flying pilotless aircraft; difficult to detect by radar; can be armed with nuclear, conventional, or chemical warheads; and can be launched from an aircraft, submarine, surface ship, or land-based platform. It possesses great accuracy because of terminal guidance.

**Depressed trajectory:** A ballistic trajectory with an abnormally low apogee to reduce the possibility of early detection by radars. Use of such trajectories has the effect of reducing the range of the missile.

**Dual-capable system:** A weapon system capable of carrying nuclear or conventional explosives.

**Dual-key system:** The method by which more than one country is included in the final decision to use nuclear weapons during time of war. This allows for consultation among allies as to the decision to resort to a nuclear attack.

**Enhanced Radiation Weapon:** Also known as the neutron bomb, the enhanced radiation weapon is an atomic bomb designed to enhance the ratio of neutron output to blast. Primarily an anti-personnel weapon, it is regarded as potentially more suitable for use against an armored assault in a heavily urbanized area.

**Escalation dominance:** The ability of one side in a conflict to gain a net military advantage by going to the next higher level of force.

**Extended deterrence:** The extension of the American nuclear umbrella to areas such as Western Europe, the Republic of Korea, and Japan.

**First strike:** Used to refer to what is sometimes called a "disarming first strike": a large nuclear attack intended to destroy the retaliatory forces of the opponent, leaving forces insufficient to inflict substantial damage on the attacker.

**First use:** The initial use of nuclear weapons of any size and against any target by either party to a conflict.

**Flexible response:** A strategy providing for the maintenance of capabilities to respond in kind or with incrementally greater force to various levels of conventional or nuclear aggression; first proposed to NATO by the U.S. in 1962; finally adopted by the Alliance in 1967 to replace the strategy of massive retaliation.

**Forward Base System (FBS):** Refers to systems based and operating close to enemy territory—for instance, U.S. bombers, aircraft carriers, and missiles based in the European and East Asian areas.

**Hard target:** A target protected against the blast, heat and radiation of nuclear explosions; for instance a missile silo.

**Launch on warning:** Refers to a retaliatory strike launched on the detection of an enemy attack before the enemy weapons have arrived and exploded.

**Launch under attack:** A policy of launching missiles under attack conditions to prevent a large number of them from being destroyed in their silos.

**Midgetman missile:** A single-warhead, mobile, land-based ICBM under development by the United States.

**Multiple Independently-targetable Reentry Vehicle (MIRV):** One of two or more reentry vehicles carried by one ballistic missile but capable of being directed to individual targets.

**Mutually Assured Destruction (MAD):** Refers to the ability of the U.S. and the U.S.S.R. to destroy each other as modern societies even after they have endured a full-scale initial nuclear attack.

**MX missile:** A MIRVed, fixed, land-based ICBM with ten warheads; the U.S. intends to deploy fifty MXs in Minuteman silos.

**National Command Authorities (NCA):** Top national security decisionmakers.

**Nuclear threshold:** The point at which nuclear weapons are first used by either side (i.e., efforts to reduce reliance on nuclear weapons are attempts to "raise the nuclear threshold").

**Permissive action link (PAL):** A code device attached to nuclear weapons deployed abroad that impedes the unauthorized arming or firing of the weapon.

**Precision Guided Munition (PGM):** A weapon of great accuracy that homes in on the target with terminal guidance.

**Prompt target:** See "Time-urgent target."

**Second strike:** A retaliatory nuclear attack in response to a strategic nuclear strike by the adversary.

**Single Integrated Operational Plan (SIOP):** U.S. plan for strategic retaliatory strike in the event of nuclear war, including targets, tactics and force strength needed for such a plan.

**Time-urgent target:** A target that can be more easily located or destroyed early in a conflict; includes bombers still on the ground and nuclear munitions still concentrated in storage sites.

**Transporter Erector Launcher (TEL):** The combined transporting vehicle and launch platform for a GLCM.

**World-wide Military Command and Control System:** The operational direction and support of U.S. forces deployed throughout the world is provided through this system, which also contains the National Military Command System.