Mutual assured destruction

Mutual Assured Destruction, or mutually assured destruction (MAD), is a doctrine of military strategy and national security policy in which a full-scale use of high-yield weapons of mass destruction by two opposing sides would effectively result in the complete, utter and irrevocable annihilation of both the attacker and the defender, becoming thus a war that has no victory nor any armistice but only effective reciprocal destruction. It is based on the theory of deterrence according to which the deployment, and implicit menace of use, of strong weapons is essential to threaten the enemy in order to prevent the use by said-enemy of the same weapons against oneself. The strategy is effectively a form of Nash equilibrium in which neither side, once armed, has any incentive to disarm thereafter.

Theory

The doctrine of Mutual Assured Destruction (MAD) assumes that each side has enough nuclear weaponry to destroy the other side; and that either side, if attacked for any reason by the other, would retaliate without fail with equal or greater force. The expected result is an immediate irreversible escalation of hostilities resulting in both combatants' mutual, total and assured destruction.

The doctrine further assumes that neither side will dare to launch a first strike because the other side will launch on warning (also called fail-deadly) or with secondary forces a (second strike), resulting in the destruction of both parties. The payoff of the MAD doctrine is expected to be a tense but stable global peace.

The primary application of this doctrine started during the Cold War (1940s to 1990s) in which MAD was seen as helping to prevent any direct full-scale conflicts between the United States and the Soviet Union while they engaged in smaller proxy wars around the world. It was also responsible for the arms race, as both nations struggled to keep nuclear parity, or at least retain second-strike capability. Although the Cold War ended in the early 1990s, the doctrine of Mutual Assured Destruction certainly continues to be in force.

Proponents of MAD as part of U.S. and USSR strategic doctrine believed that nuclear war could best be prevented if neither side could expect to survive a full-scale nuclear exchange as a functioning state. Since the credibility of the threat is critical to such assurance, each side had to invest substantial capital in their nuclear arsenals even if they were not intended for use. In addition, neither side could be expected or allowed to adequately defend itself against the other's nuclear missiles. This led both to the hardening and diversification of nuclear delivery systems (such as nuclear missile silos, ballistic missile submarines and nuclear bombers kept at fail-safe points) and to the Anti-Ballistic Missile Treaty.

This MAD scenario is often referred to as nuclear deterrence. The term deterrence was first used in this context after World War II; prior to that time, its use was limited to legal terminology.
History

Pre-1945

Perhaps the earliest reference to the concept comes from the English author Wilkie Collins, writing at the time of the Franco-Prussian War in 1870: "I begin to believe in only one civilising influence—the discovery one of these days of a destructive agent so terrible that War shall mean annihilation and men's fears will force them to keep the peace".

Echoes of the doctrine can be found in the first document which outlined how the atomic bomb was a practical proposition. In March 1940, the Frisch-Peierls memorandum anticipated deterrence as the principal means of combating an enemy with nuclear weapons.

In practice during World War II, utter annihilation from the air had already been visited upon the enemies of the Allied forces, both in Europe and Japan, well before use of the Atomic Bomb, and with perhaps even deadlier results. The incendiary attacks on Dresden, Germany, and Tokyo, Japan, e.g., in efforts to finally force surrender and end both the European and Pacific Theaters, set the precedent for the concepts of Total War and MAD.

Early Cold War

In August 1945, the United States accepted the surrender of Japan after the nuclear attacks on Hiroshima and Nagasaki. Four years later, on August 29, 1949, the Soviet Union detonated its own nuclear weapon. At the time, both sides lacked the means to effectively use nuclear devices against each other. However, with the development of aircraft like the Convair B-36, both sides were gaining a greater ability to deliver nuclear weapons into the interior of the opposing country. The official nuclear policy of the United States was one of "massive retaliation", as coined by President Dwight D. Eisenhower's Secretary of State John Foster Dulles, which called for massive attack against the Soviet Union if they were to invade Europe, regardless of whether it was a conventional or a nuclear attack.

During the 1962 Cuban Missile Crisis, the Soviet Union truly developed an understanding of the effectiveness of U.S. ballistic missile submarine forces, and work on Soviet ballistic missile submarines began in earnest. For the remainder of the Cold War, although official positions on MAD changed in the United States, the consequences of the second strike from ballistic missile submarines was never in doubt.
The multiple independently targetable re-entry vehicle (MIRV) was another weapons system designed specifically to aid with the MAD nuclear deterrence doctrine. With a MIRV payload, one ICBM could hold many separate warheads. MIRVs were first created by the United States in order to counterbalance Soviet anti-ballistic missile systems around Moscow. Since each defensive missile could only be counted on to destroy one offensive missile, making each offensive missile have, for example, three warheads (as with early MIRV systems) meant that three times as many defensive missiles were needed for each offensive missile. This made defending against missile attacks more costly and difficult. One of the largest U.S. MIRVed missiles, the LGM-118A Peacekeeper, could hold up to 10 warheads, each with a yield of around 300 kilotons—all together, an explosive payload equivalent to 230 Hiroshima-type bombs. The multiple warheads made defense untenable with the technology available, leaving only the threat of retaliatory attack as a viable defensive option. MIRVed land-based ICBMs are considered destabilizing because they tend to put a premium on striking first. It is because of this that this type of weapon was banned under the START II agreement.

In the event of a Soviet conventional attack on Western Europe, NATO planned to use tactical nuclear weapons. The Soviet Union countered this threat by issuing a statement that any use of nuclear weapons (tactical or otherwise) against Soviet forces would be grounds for a full-scale Soviet retaliatory strike. Thus it was generally assumed that any combat in Europe would end with apocalyptic conclusions. The quote "I know not with what weapons World War III will be fought, but World War IV will be fought with sticks and stones" is generally attributed to Albert Einstein.[2]

Second strike capability

It was only with the advent of ballistic missile submarines, starting with the George Washington class in 1959, that a survivable nuclear force became possible and second strike capability credible. This was not fully understood until the 1960s when the strategy of mutually assured destruction was first fully described, largely by United States Secretary of Defense Robert McNamara.

In McNamara's formulation, MAD meant that nuclear nations either had first strike or second strike capability. A nation with first strike capability would be able to destroy the entire nuclear arsenal of another nation and thus prevent any nuclear retaliation. Second strike capability indicated that a nation could uphold a promise to respond to a nuclear attack with enough force to make such a first attack highly undesirable. According to McNamara, the arms race was in part an attempt to make sure that no nation gained first strike capability.

An early form of second strike capability had already been provided by the use of continual patrols of nuclear-equipped bombers, with a fixed number of planes always in the air (and therefore untouchable by a first strike) at any given time. The use of this tactic was reduced however, by the high logistic difficulty of keeping enough planes active at all times, and the increasing priority given to ICBMs over bombers (which might be shot
down by air defenses before reaching their targets).

Ballistic missile submarines established a second strike capability through their stealth and by the number fielded by each Cold War adversary—it was highly unlikely that all of them could be targeted and preemptively destroyed (in contrast to, for example, a missile silo with a fixed location that could be targeted during a first strike). Given their long range, high survivability and ability to carry many medium- and long-range nuclear missiles, submarines were credible and effective means for full-scale retaliation even after a massive first strike.

Late Cold War

The original doctrine of U.S. MAD was modified on July 25, 1980, with U.S. President Jimmy Carter’s adoption of countervailing strategy with Presidential Directive 59. According to its architect, Secretary of Defense Harold Brown, "countervailing strategy" stressed that the planned response to a Soviet attack was no longer to bomb Russian population centers and cities primarily, but first to kill the Soviet leadership, then attack military targets, in the hope of a Russian surrender before total destruction of the USSR (and the United States). This modified version of MAD was seen as a winnable nuclear war, while still maintaining the possibility of assured destruction for at least one party. This policy was further developed by the Reagan Administration with the announcement of the Strategic Defense Initiative (nicknamed "Star Wars"), the goal of which was to develop space-based technology to destroy Soviet missiles before they reached the U.S.

SDI was criticized by both the Soviets and many of America's allies (including Prime Minister of the United Kingdom Margaret Thatcher) because, were it ever operational and effective, it would have undermined the "assured destruction" required for MAD. If America had a guarantee against Soviet nuclear attacks, its critics argued, it would have first strike capability which would have been a politically and militarily destabilizing position. Critics further argued that it could trigger a new arms race, this time to develop countermeasures for SDI. Despite its promise of nuclear safety, SDI was described by many of its critics (including Soviet nuclear physicist and later peace activist Andrei Sakharov) as being even more dangerous than MAD because of these political implications. Supporters also argued that SDI could trigger a new arms race, forcing the USSR to spend an increasing proportion of GDP on defense - something which has been claimed to have been an indirect cause of the eventual collapse of the Soviet Union.

Proponents of Ballistic Missile Defense (BMD) argue that MAD is exceptionally dangerous in that it essentially offers a single course of action in the event of nuclear attack: full retaliatory response. The fact that nuclear proliferation has led to an increase in the number of nations in the "nuclear club", including nations of questionable stability (Pakistan and North Korea, e.g.), and that a nuclear nation might be hijacked by a despot or other person or persons who might use nuclear weapons without sane regard for the consequences, presents a strong case for proponents of BMD who seek a policy which both protects against attack, but also does not require an escalation into what might become global nuclear war. Russia continues to have a strong public distaste for Western BMD initiatives, presumably because proprietary operative BMD systems could exceed their technical and financial resources, and therefore degrade their larger military standing and sense of security in a post-MAD environment. Russian refusal to accept invitations to participate in NATO BMD may be indicative of the lack of an alternative to MAD in current Russian war fighting strategy due to dilapidation of conventional forces after the breakup of the Soviet Union.
**Post Cold War**

After the fall of the Soviet Union, the Russian Federation emerged as a sovereign entity encompassing most of the territory of the former USSR. Relations between the U.S. and this new power have been less tense than they had been with its predecessor. Tensions also decreased between the U.S. and China.

The administration of U.S. President George W. Bush withdrew from the Anti-Ballistic Missile Treaty in June 2002, claiming that the limited national missile defense system which they propose to build is designed only to prevent nuclear blackmail by a state with limited nuclear capability and is not planned to alter the nuclear posture between Russia and the United States.

While relations have improved and an intentional nuclear exchange is more unlikely, the decay in Russian nuclear capability in the post Cold War era may have had an effect on the continued viability of the MAD doctrine. An article by Keir Lieber and Daryl Press stated that the United States could carry out a nuclear first strike on Russia and would “have a good chance of destroying every Russian bomber base, submarine, and ICBM.” This was attributed to reductions in Russian nuclear stockpiles and the increasing inefficiency and age of that which remains. Lieber and Press argued that the MAD era is coming to an end and that U.S. is on the cusp of global nuclear primacy.\(^3\)

However, in a follow up article in the same publication, others criticized the analysis, including Peter Flory, the U.S. Assistant Secretary of Defense for International Security Policy, who began by writing "The essay by Keir Lieber and Daryl Press contains so many errors, on a topic of such gravity, that a Department of Defense response is required to correct the record."\(^4\) Regarding reductions in Russian stockpiles, another response stated that "a similarly one-sided examination of [reductions in] U.S. forces would have painted a similarly dire portrait".

A situation in which the United States might actually be expected to carry out a "successful" attack is perceived as a disadvantage for both countries. The strategic balance between the United States and Russia is becoming less stable, and the objective, technical possibility of a first strike by the United States is increasing. At a time of crisis, this instability could lead to an accidental nuclear war. For example, if Russia feared a U.S. nuclear attack, Moscow might make rash moves (such as putting its forces on alert) that would provoke a U.S. preemptive strike.\(^4\) An outline of current United States nuclear strategy toward both Russia and other nations was published as the document "Essentials of Post–Cold War Deterrence" in 1995.
**Official policy**

Whether MAD was the officially accepted doctrine of the United States military during the Cold War is largely a matter of interpretation. The term MAD was not coined by the military but by President Dwight D. Eisenhower's Secretary of State John Foster Dulles. The United States Air Force, for example, has retrospectively contended that it never advocated MAD as a sole strategy, and that this form of deterrence was seen as one of numerous options in U.S. nuclear policy.[5] Former officers have emphasized that they never felt as limited by the logic of MAD (and were prepared to use nuclear weapons in smaller scale situations than "Assured Destruction" allowed), and did not deliberately target civilian cities (though they acknowledge that the result of a "purely military" attack would certainly devastate the cities as well). MAD was implied in several U.S. policies and used in the political rhetoric of leaders in both the U.S. and the USSR during many periods of the Cold War.

To continue to deter in an era of strategic nuclear equivalence, it is necessary to have nuclear (as well as conventional) forces such that in considering aggression against our interests any adversary would recognize that no plausible outcome would represent a victory or any plausible definition of victory. To this end and so as to preserve the possibility of bargaining effectively to terminate the war on acceptable terms that are as favorable as practical, if deterrence fails initially, we must be capable of fighting successfully so that the adversary would not achieve his war aims and would suffer costs that are unacceptable, or in any event greater than his gains, from having initiated an attack.


**Criticism**

Critics of the MAD doctrine frequently played on the similarity between the acronym and the common word for mental illness.

The doctrine of nuclear deterrence depends on several challengeable assumptions:

**Second-strike capability**

- A first strike must not be capable of preventing a retaliatory second strike or else mutual destruction is not assured. In this case, a state would have nothing to lose with a first strike; or might try to preempt the development of an opponent's second-strike capability with a first strike (i.e., decapitation strike). To avoid this, countries may design their nuclear forces to make decapitation strike almost impossible, by dispersing launchers over wide areas and using a combination of sea-based, air-based, underground, and mobile land-based launchers.

**Perfect detection**

- No false positives (errors) in the equipment and/or procedures that must identify a launch by the other side. The implication of this is that an accident could lead to a full nuclear exchange. During the Cold War there were several instances of false positives, as in the case of Stanislav Petrov.
- No possibility of camouflaging a launch. The use of stealth technology in aircraft such as the B-2 bomber makes this assumption less likely to be fulfilled.
• No means of delivery that does not have the characteristics of a long range missile delivery, i.e. detectable far ahead of detonation. Again this assumption is challengeable with for instance stealth aircraft but also with other means, such as smuggling weapons to the target undetected. A close range missile attack from a submarine would also negate this assumption, as would positioning the weapons close to the intended target (exemplified in the Cuban Missile Crisis).

• Perfect attribution. If there is a launch from the Sino-Russian border, it could be difficult to distinguish which nation is responsible and, hence, against which nation retaliation should occur.

**Perfect rationality**

• No "rogue states" will develop nuclear weapons. Or, if they do, they will stop behaving as rogue states and subject themselves to the logic of MAD.

• No rogue commanders will have the ability to corrupt the launch decision process (this is demonstrated with *Dr. Strangelove*).

• All leaders with launch capability care about the survival of their subjects (for example, a leader with religious ideas about the end of the world might launch regardless).

• No leader with launch capability would strike first and gamble that the opponent's response system would fail.

**Inability to defend**

• No fallout shelter networks of sufficient capacity to protect large segments of the population and/or industry.

• No development of anti-missile technology or deployment of remedial protective gear.

**References**


[5] [National Archives and Records Administration, RG 200, Defense Programs and Operations, LeMay's Memo to President and JCS Views, Box 83. Secret.]

**External links**


• Herman Kahn's Doomsday Machine (http://trace.ntu.ac.uk/frame2/articles/borg/kahn.html)

• Robert McNamara's "Mutual Deterrence" speech from 1967 (http://www.atomicarchive.com/Docs/Deterrence.shtml)

• Getting MAD: Nuclear Mutual Assured Destruction (http://www.strategicstudiesinstitute.army.mil/Pubs/display.cfm?pubid=585)

• Center for Arms Control and Non-Proliferation (http://www.armscontrolcenter.org)

• Council for a Livable World (http://www.clw.org)

• Nuclear Files.org (http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/history/cold-war/strategy/strategy-mutual-assured-destruction.htm) Mutual Assured Destruction

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