

## Tick tock: It is 6 minutes to midnight.

Written by Angeliki Mitropoulou

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ANGELIKI MITROPOULOU, JAN 28 2011

This is not a review about a film, although it could be. It would be an appropriate title for a movie like Armageddon or a documentary that focuses on how to save the world. Many scholars argue that the 20<sup>th</sup> century has suffered major geopolitical earthquakes that have completely changed the scenery of international affairs and world politics. However, others argue that events of 21<sup>st</sup> century's first decade, like 9/11 and the recent economic crisis in US and Europe are indicative of the precarious future we are facing. A common element of both centuries is the creation and evolution of nuclear weapons. Many scholars often comment and debate about the changes in threat perceptions after the end of World War II, during the Cold War and the impact of 9/11 but few can deny the importance of nuclear weapons.

In 1947, after the first atomic bombs were dropped in Hiroshima and Nagasaki, the Bulletin of the Atomic Scientists (BAS) created the Doomsday Clock, which is a symbolic clock face. By moving the hand of the Clock away from midnight—the figurative end of civilization—the BAS Board of Directors draws attention to encouraging signs of progress mainly towards nuclear proliferation and prevention of climate change. At the same time, the small increment of the change reflects both the threats that remain around the globe and the danger that governments may fail to deliver on pledged actions on reducing nuclear weapons and mitigating climate change.

On 14th January 2010 in New York City, the Bulletin of the Atomic Scientists adjusted the clock from 5 to 6 minutes from midnight in order to encourage progress seen around the globe in two key threat areas: nuclear weapons and climate change. The decision by the BAS Science and Security Board was made in consultation with the Bulletin's Board of Sponsors, which includes 19 Nobel Laureates. They claimed that their decision to move the clock back was based on the existence of a more "hopeful state of world affairs". The clock had been adjusted 18 times before 14th January 2010 since its initial start at seven minutes to midnight. The timetable below demonstrates the combination of major events and decisions made about "the time the clock shows".

### *Timeline*

2010 – **6 MINUTES**: International cooperation was a critical element of international affairs when the clock changed in 2010. Talks between Washington and Moscow for a follow-on agreement to the Strategic Arms Reduction Treaty were nearly complete, and more negotiations for further reductions in the U.S. and Russian nuclear arsenal were already planned. Many journalists in US and Europe have commented about the nuclear weapons in modern history and foreign policy. Almost from the moment the first atomic bomb was detonated in New Mexico in July 1945, the menacing aura of the nuclear age has inspired hopes for a world free of nuclear weapons, however difficult this may sound. But since the end of the Cold War, there has been a notable shifting in strategic thinking and focus from the vast arsenals of the United States and China to worries about terrorism and the rise of new nuclear states like North Korea, because of the tests it launched in earlier years, and Iran, which Western officials believe has been working to build one.

In April 2009, Barack Obama announced in a speech in Prague his vision of an eventual dismantling of all nuclear weapons. A year later, he declared that the new nuclear strategy that would be followed narrowed the circumstances under which the United States would use nuclear weapons and travelled to Prague to meet Russia's president, Dmitri A. Medvedev, where they signed a treaty that would pare back both countries' nuclear arsenals.

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2007 – **5 MINUTES**: The world stood at the brink of a second nuclear age. The United States and Russia remained ready to stage a nuclear attack within minutes, North Korea conducted a nuclear test, and many in the international community worried that Iran was moving closer to independent mastery of the nuclear fuel cycle which would allow it to build a nuclear arsenal. Climate change also continued to present a dire challenge to humanity. Damage to ecosystems was already taking place; flooding, destructive storms, increased drought, and polar ice melt caused loss of life and property.

2002 – **7 MINUTES**: Concerns regarding a nuclear terrorist attack underscored the enormous amount of unsecured, and sometimes unaccounted for, weapons-grade nuclear materials located throughout the world. Meanwhile, the United States expressed a desire to design new nuclear weapons, with an emphasis on those able to destroy hardened and deeply buried targets. It also rejected a series of arms control treaties and announced it would withdraw from the Anti-Ballistic Missile Treaty.

1998 – **9 MINUTES**: India and Pakistan staged nuclear weapons tests only three weeks apart. “The tests are a symptom of the failure of the international community to fully commit itself to control the spread of nuclear weapons—and to work toward substantial reductions in the numbers of these weapons,” a dismayed Bulletin reports. Russia and the United States continued to serve as poor examples to the rest of the world. Together, they still held 7,000 warheads ready to launch within 15 minutes.

1995 – **14 MINUTES**: Hopes for a large post-Cold War peace dividend and a renouncing of nuclear weapons had faded. Particularly in the United States, hard-liners seemed reluctant to soften their rhetoric or actions, as they claimed that a resurgent Russia could provide as much of a threat as the Soviet Union. Such talk slowed the rollback in global nuclear forces; more than 40,000 nuclear weapons remained worldwide at the time. There is also concern that terrorists could exploit poorly secured nuclear facilities in the former Soviet Union.

1991 – **17 MINUTES**: With the Cold War officially over, the United States and Russia begin making deep cuts to their nuclear arsenals. The Strategic Arms Reduction Treaty greatly reduced the number of strategic nuclear weapons deployed by the two former adversaries. Better still, a series of unilateral initiatives had removed most of the intercontinental ballistic missiles and bombers in both countries from hair-trigger alert. “The illusion that tens of thousands of nuclear weapons are a guarantor of national security has been stripped away,” the Bulletin declared.

1990 – **10 MINUTES**: As one Eastern European country after another (Poland, Czechoslovakia, Hungary, Romania) freed itself from Soviet control, Soviet General Secretary Mikhail Gorbachev refused to intervene, halting the ideological battle for Europe and significantly diminishing the risk of all-out nuclear war. In late 1989, the Berlin Wall fell which symbolized the ending of the Cold War. “Forty-four years after Winston Churchill’s ‘Iron Curtain’ speech, the myth of monolithic communism has been shattered for all to see,” the Bulletin proclaimed.

1988 – **6 MINUTES**: The United States and Soviet Union signed the historic Intermediate-Range Nuclear Forces Treaty, the first agreement to actually ban a whole category of nuclear weapons. The leadership shown by President Ronald Reagan and Soviet Premier Mikhail Gorbachev had made the treaty a reality, but public opposition to U.S. nuclear weapons in Western Europe inspired it. For years, such intermediate-range missiles had kept Western Europe in the crosshairs of the two superpowers.

1984 – **3 MINUTES**: U.S.-Soviet relations reach their iciest point in decades. Dialogue between the two superpowers virtually stops. “Every channel of communications has been constricted or shut down; every form of contact has been attenuated or cut off. And arms control negotiations have been reduced to a species of propaganda,” a concerned Bulletin informs readers. The United States seems to flout the few arms control agreements in place by seeking an expansive, space-based anti-ballistic missile capability, raising worries that a new arms race will begin.

1981 – **4 MINUTES**: The Soviet invasion of Afghanistan had hardened the U.S. nuclear posture. President Jimmy Carter pulled the United States from the 1980 Olympics Games in Moscow. The rhetoric only intensified with the election of Ronald Reagan as president. Reagan scrapped any talk of arms control and proposed that the best way to end the Cold War was for the United States to win it.

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1980 – **7 MINUTES**: Thirty-five years after the start of the nuclear age and after some promising disarmament gains, the United States and the Soviet Union were still viewing nuclear weapons as an integral component of their national security. This stalled progress discourages the Bulletin: “[The Soviet Union and United States have] been behaving like what may best be described as ‘nucleoholics’—drunks who continue to insist that the drink being consumed is positively ‘the last one,’ but who can always find a good excuse for ‘just one more round.’”

1974 – **9 MINUTES**: South Asia got the Bomb, as India tested its first nuclear device. Any gains in previous arms control agreements seemed like a mirage. The United States and Soviet Union appeared to be modernizing their nuclear forces, not reducing them. Thanks to the deployment of multiple independently targetable reentry vehicles (MIRV), both countries could load their intercontinental ballistic missiles with more warheads than before.

1972 – **12 MINUTES**: The United States and Soviet Union attempted to curb the race for nuclear superiority by signing the Strategic Arms Limitation Treaty (SALT) and the Anti-Ballistic Missile (ABM) Treaty. The two treaties forced a nuclear parity of sorts. SALT limited the number of ballistic missile launchers either country can possess, and the ABM Treaty stopped an arms race in defensive weaponry from developing.

1969 – **10 MINUTES**: Nearly all of the world’s nations came together to sign the Nuclear Non-Proliferation Treaty. The deal was simple; the nuclear weapon states vowed to help the treaty’s non-nuclear weapon signatories develop nuclear power if they promised to forego producing nuclear weapons. The nuclear weapon states also pledged to abolish their own arsenals when political conditions allowed for it. Although Israel, India, and Pakistan had refused to sign the treaty, the Bulletin was cautiously optimistic: “The great powers have made the first step. They must proceed without delay to the next one—the dismantling, gradually, of their own oversized military establishments.”

1968 – **7 MINUTES**: Regional wars were raging. U.S. involvement in Vietnam intensified while India and Pakistan were battling in 1965, and Israel and its Arab neighbours had renewed hostilities in 1967. Worse yet, France and China had been developing nuclear weapons to assert themselves as global players. “There is little reason to feel sanguine about the future of our society on the world scale,” the Bulletin laments. “There is a mass revulsion against war, yes; but no sign of conscious intellectual leadership in a rebellion against the deadly heritage of international anarchy.”

1963 – **12 MINUTES**: After a decade of almost non-stop nuclear tests, the United States and Soviet Union signed the Partial Test Ban Treaty, which ended all atmospheric nuclear testing. While it did not outlaw underground testing, the treaty represented some progress in at least slowing the arms race. It also signaled awareness among the Soviets and United States that they needed to work together to prevent nuclear annihilation.

1960 – **7 MINUTES**: Political actions belied the tough talk of “massive retaliation.” For the first time, the United States and Soviet Union appeared eager to avoid direct confrontation in regional conflicts such as the 1956 Egyptian-Israeli dispute. Joint projects that built trust and constructive dialogue between third parties also quelled diplomatic hostilities. Scientists initiated many of these measures, helping establish the International Geophysical Year, a series of coordinated, worldwide scientific observations, and the Pugwash Conferences, which allowed Soviet and American scientists to interact.

1963 – **2 MINUTES**: After much debate, the United States decides to pursue the hydrogen bomb, a weapon far more powerful than any atomic bomb. In October 1952, the United States tests its first thermonuclear device, obliterating a Pacific Ocean islet in the process; nine months later, the Soviets test an H-bomb of their own. “The hands of the Clock of Doom have moved again,” the Bulletin announces. “Only a few more swings of the pendulum and, from Moscow to Chicago, atomic explosions will strike midnight for Western civilization.”

1949 – **3 MINUTES**: The Soviet Union denied it, but in the fall, President Harry Truman told the American public that the Soviets tested their first nuclear device, officially starting the arms race. “We do not advise Americans that doomsday is near and that they can expect atomic bombs to start falling on their heads a month or year from now,” the Bulletin explained. “But we think they have reason to be deeply alarmed and to be prepared for grave decisions.”

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1947 – **7 MINUTES**: As the Bulletin evolved from a newsletter into a magazine, the Clock appeared on the cover for the first time. It still symbolizes the urgency of the nuclear dangers that the magazine's founders—and the broader scientific community—are trying to convey to the public and political leaders around the world.

It is worth mentioning the recommendations of BAS for global security in the areas of nuclear weapons and environmental threats. Their suggestions were the following:

- The development of new nuclear doctrines that disavow the use of existing nuclear weapons, reduce the launch readiness of U.S. and Russian nuclear forces, and remove them from the day-to-day operations of their militaries;
- The finishing of consolidating and securing military and civilian nuclear material in Russia, the United States, and elsewhere and continuing to eliminate the excess;
- The completion of negotiations, the signing and rapid ratification of the new U.S.-Russia treaty providing for reductions in deployed nuclear warheads and delivery systems;
- Upon signing of the treaty, the immediate embarking upon new talks to further reduce the nuclear arsenals of Russia and the United States;
- Completing the next review of the Nuclear Nonproliferation Treaty in May 2010 with commitments to weapons reduction and nuclear nonproliferation by both the nuclear haves and have-nots;
- Implementing multinational management of the civilian nuclear energy fuel cycle with strict standards for safety, security, and nonproliferation of nuclear weapons, including eliminating reprocessing for plutonium separation;
- Strengthening the International Atomic Energy Agency's capacity to oversee nuclear materials and technology development and transfer;
- Adopting and fulfilling climate change agreements to reduce carbon dioxide emissions through tax incentives, harmonized domestic regulation and practice;
- The transformation of the coal power sector of the world economy to retire older plants; and
- The vast increase of public and private investments in alternatives to carbon-emitting energy sources, such as solar and wind, and in technologies for energy storage, and sharing the results worldwide.

It is necessary to underline that significance of political will and cooperation among United States, European Union member states and BRIC countries (Brazil, Russia, India and China) for achieving the common goal as it is depicted in the symbolic attempt of the Bulletin of Atomic Scientists. Lawrence Krauss, co-chair of the BAS board of sponsors, has warned scientists that there was still much to be done. Many underlined from the beginning of the 21<sup>st</sup> century that it is about time to re-estimate the role of the nuclear weapons as an element of national defence and global security. They argue that despite the end of the Cold War has ended, threats have not ceased to exist but they are appearing in "different forms". Younger (2000) has underlined especially the importance of technology as it is "inexorable advancing" with an impact both on nuclear and climate change. Bearing in mind the suggestions of BAS it is rather obvious that governments have still a long road until the point when the clock could move even further away from midnight.

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