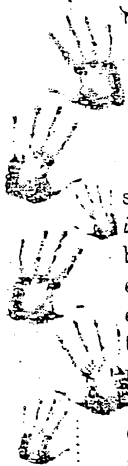


THE DOOMSDAY CLOCK IS TICKING

Subrata Ghoshroy



THE famous Doomsday Clock of the *Bulletin of Atomic Scientists* sits at seven minutes to midnight, the same setting when it made its debut in 1947 as a symbol of nuclear danger. The *Bulletin*, published monthly, was founded by a group of scientists from the super-secret Manhattan Project that developed the first atomic bomb, and they've been warning the world of nuclear dangers since the end of World War II. Reading about the clock's history on the *Bulletin's* website, I noticed how its minute hand, signifying the state of international security, had moved back and forth over the last five decades. The clock

was designed as a cover for the *Bulletin* by artist Martyl Langsdorf, the wife of a physicist working on the Manhattan Project, and it goes that her simple design captured readers' imagination, evoking both the imagery of apocalypse (midnight) and the contemporary idiom of military attack — the countdown to zero hour.

The closest setting — two minutes to midnight — occurred in 1953, when the USA and the Soviet Union tested a thermonuclear bomb within nine months of each other. The farthest was in 1991, when the clock was set at 17 minutes to midnight to mark the US-Soviet Union signing of the Strategic Arms Reduction Treaty, which promised that their respective

arsenals would be reduced to less than 3,500 each by 2007.

The euphoria generated by the end of the Cold War was shortlived. Since 1991, the clock has progressively moved forward. In 1995, it was moved to 14 minutes, recognising for the first time the perception of a newly emerging danger — the leakage of nuclear materials. It was next set at nine minutes in 1998 after the Indian and Pakistani tests. The *Bulletin* inexplicably failed to take note of the 1996 French nuclear tests under the Pacific Ocean that were ordered by newly elected President Jacques Chirac immediately before France signed the Comprehensive Test Ban Treaty amid worldwide protests. The clock

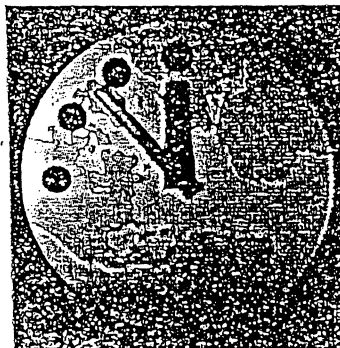
moved forward to seven minutes in 2002 as an indication of growing tensions in international affairs and the US announcement of its intention to withdraw from the landmark 1972 Anti-Ballistic Missile Treaty.

More than 31,000 nuclear weapons are still maintained by the powers-that-be and 95 per cent of these weapons are in the USA and Russia. An astonishing 16,000 of these remain operationally deployed, mostly targeting each other.

The *Bulletin* clock is not meant to be a quantitative measure of the nuclear danger facing the world. Its editors also point out that, especially since the end of the Cold War, many people believe the clock has lost its apocalyptic meaning. Nevertheless, the movement of the minute hand, forward or backward over the years, has acquired great symbolic value in alerting people about the state of the world we live in.

Contrary to the expectations of peace-loving people across the world, the first post-Cold War decade has been anything but peaceful. Genocidal wars continue to be fought in Africa and the world's greatest military machine has from afar repeatedly unleashed its hi-tech weapons, wreaking havoc on unmatched Third World militaries and their defenceless peoples. The words communism and totalitarianism have given way to new ones: terrorism and weapons of mass destruction, better known as WMDs. And WMD is probably one of the most recognised acronyms throughout the world, thanks to CNN and other satellite TV channels. They have also helped bring about a vast change in perception, especially in the West, of the danger facing the world not only from nuclear but also biological and chemical weapons.

Ironically, the WMD scare began with the dramatic dissolution of the Soviet Union. In its wake, as the overt nuclear standoff between the superpowers waned, what took centre-stage were the "loose nukes" and concerned centres around how to pre-



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vent nuclear materials and scientists in the former Soviet Union from falling in the hands of "rogue nations".

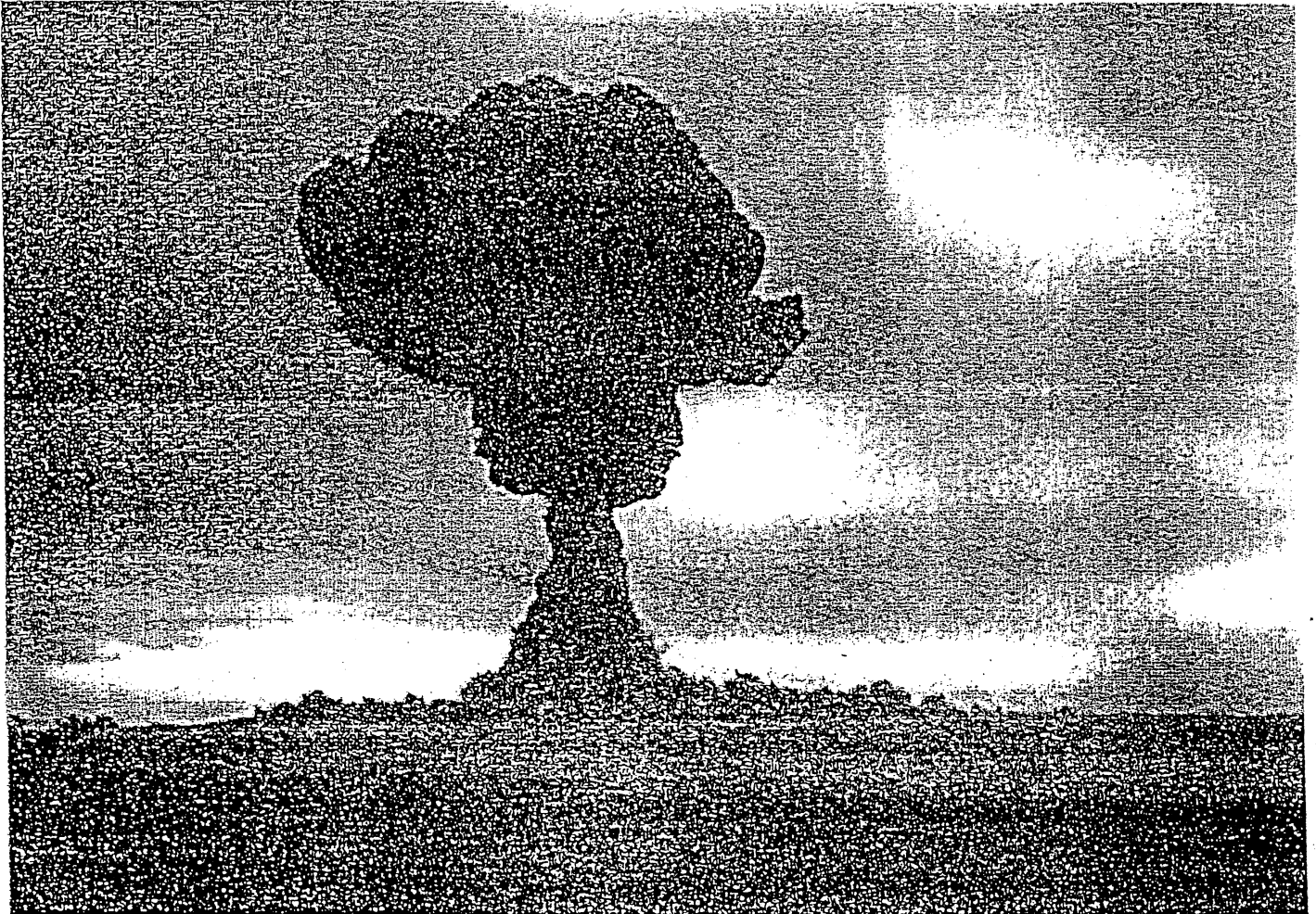
During the Cold War, the two superpowers faced each other with their ever growing arsenals of nuclear and conventional weapons. There were, to be sure, other countries like Britain, France, and China – all members of a select club called the United Nations Security Council – who also possessed nuclear weapons and their delivery systems. But nuclear rivalry

was effectively limited to the two behemoths, each of whose arsenals contained thousands of weapons mounted on intercontinental ballistic missiles in land-based silos, nuclear-powered submarines, or deep penetrating bombers.

Surprisingly, there was little spread in nuclear weapons technology from either side throughout this period of intense superpower competition. According to mostly US experts who coined the term "loose nukes", the Soviet Union was not only highly efficient in guarding its nuclear secrets, it was also very effective in keeping its huge stockpile of bomb-grade materials secure from theft. To make even a crude nuclear bomb, one needs either highly enriched uranium or plutonium. Natural uranium ore contains a variety of isotopes and the concentration of a particular isotope is necessary to start a chain reaction. Therefore, natural uranium must be carefully processed to increase the concentration of the potent variety. In other words, it has to be enriched, which is not an insignificant feat.

The theory about the proliferation of WMDs goes as follows: with the collapse of the Soviet Union, large amounts of nuclear material have been left in states like Kazakhstan, Belarus, Georgia, or Ukraine, not to mention the enormous stockpiles of both plutonium and highly enriched uranium in facilities across Russia. On the one hand, it is assumed that, given the collapse of the economies across the former Communist states, guarding the nuclear material would be accorded low priority. On the other, both nuclear materials and scientists with the knowhow would be prime targets for other countries that nurture the ambition to acquire such weapons. These especially include so-called rogue states such as Iraq, Iran, Libya and North Korea.

To combat this potential threat, nearly \$1 billion is spent every year under the Nunn-Lugar Act, named after former Democratic senator Sam Nunn from the southern state of



Georgia, and current Republican chairman of the Senate Foreign Relations Committee, Richard Lugar of Indiana. The act was passed in 1992 by the US Congress to undertake programmes jointly with Russia and other newly independent states of the former Soviet Union. The purpose was to beef up security at nuclear facilities, to account for nuclear material stockpiles and to find alternative employment for former nuclear scientists so that they weren't snapped up by other countries not friendly toward the USA.

The danger is thought to be so serious that in some cases the USA, with the help of former Soviet-block nations, had to take dramatic steps to remove nuclear materials to safer locations. In one such instance, in

November 1994, nearly 600 kg of highly enriched uranium was airlifted in a clandestine operation from Ust-Kamenogorsk in Kazakhstan to the USA. The Kazakh government is said to have expressed apprehension that it might not be able to protect the material and there were indications the Iranians had expressed an interest in acquiring it. The undertaking, which came to be known as Project Sapphire, was reportedly accomplished after more than a year of secret negotiations with the Kazakh and Russian authorities. It was fully paid for by the USA, which also purchased the uranium with both cash and promises of assistance for other projects.

In another instance in August 2002, the USA, in cooperation with

Yugoslav and Russian authorities, along with a privately-funded US organisation called the Nuclear Threat Initiative, secretly removed some 100 pounds of highly-enriched uranium from the Vinca Institute near Belgrade. The material which came originally from the Soviet Union to support nuclear research was flown under elaborate military escort to the Ulyanovsk Nuclear Processing Plant in Russia. The operation reportedly cost \$7.5 million, of which \$2.5 million came from the US State Department and the other \$5 million from NTI. Incidentally, NTI was founded by media mogul Ted Turner who founded the TV network, CNN.

Despite such high-profile operations and the pronounced level of the danger, however, the funding for such

activities has been quite modest when viewed against the total US defence budget which is approaching \$400 billion a year. Interestingly, the programme has also faced challenges almost every year in Congress from mostly conservative members who allege that even under Vladimir Putin, Russia cannot be fully trusted and that Communism could resurface at any moment. In any case, they argue that US taxpayers' money is being diverted by the Russian government to pay for other more pressing needs and not to mind the nuclear store.

However, with Russia's increasing cooperation in international affairs as well as improvements in its domestic situation, such fears have gradually diminished although hiccups occur periodically whenever the Russians fail to behave appropriately, ie, collaborate with the Iranians on nuclear energy, or oppose the war on Iraq.

While much of US attention since the end of the Cold War is focussed on, if not money, then on countering the proliferation of WMDs to unsavoury clients, the relevance of such treaties and agreements like Start or ABM, which prevented the use of nuclear weapons for five decades, are being called into question. It is noteworthy that the ABM was called a "relic of the Cold War" to justify abandoning it, although the clamour for withdrawal from the treaty actually started soon after President Ronald Reagan announced the Strategic Defence Initiative.

In a famous 1983 address to the nation, Reagan described his vision of a nuclear-free world with his proposal for the SDI. It was later dubbed the Star Wars speech because of its many science fiction-like aspects, such as lasers, particle beams and other forms of "death rays". Although the original SDI programme was cancelled by President George Bush Sr, many of its elements are being slowly resurrected under his son's administration.

Under the SDI programme, Rea-

gan proposed creating a missile shield around the USA to protect it against nuclear weapons delivered by intercontinental ballistic missiles. The logic was simple, typical of Reagan's plans and policies: if the missiles could be stopped by the shield, nuclear weapons would become obsolete.

Instead of a world tottering on the brink of disaster, in which two superpowers stared each other down with weapons that assured mutual destruction at a moment's notice, Reagan's "peace shield" would end all weapons. He proposed sharing this technology with America's allies such as Britain and even the Soviet Union, which he had castigated as the "evil empire".

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But there was a little problem. Russia and China did not see the peace shield as so benign. The shield would be actually made out of the same ballistic missiles that had been aimed at each other for years. However, something prevented the missiles from intercepting each other: the ABM treaty. China for one was not a party to the ABM treaty. It maintained a minimum deterrence with small arsenals of nuclear weapons mounted on a handful of intercontinental missiles. With a ballistic missile shield, the Chinese felt, the USA would take away its deterrence.

The ABM treaty also prohibited any mobile interceptors on land, sea or in space. In fact, even testing of such systems was banned, not to mention deployment. It clearly stood

in the way of the proposed shield and hence was the primary motivation for the drive toward US withdrawal from the treaty. In contrast, the ABM has been consistently described by both Russia and China as the "cornerstone" of all arms control agreements. Putin had worked very hard to preserve the treaty, but gave up after his meeting with Bush at his ranch in Crawford, Texas.

The ABM treaty, signed by Soviet leader Leonid Brezhnev and US President Richard Nixon in 1972, was followed by such arms control agreements as the Strategic Arms Limitation Treaty in 1979 and the Intermediate Nuclear Forces Treaty in 1987. According to Professor John Holdren of Harvard University, the INF treaty was the first that banned a whole class of nuclear weapons embodied in a new generation of missiles — the intermediate range Soviet SS-20 and the US Pershing II. This was followed by the Strategic Arms Reduction Treaties — Start-I and Start-II — signed in 1991 and 1993, respectively, which promised deep reductions in the intercontinental missile arsenals of both countries.

Another momentous treaty is the Nuclear Non-proliferation Treaty, which was signed in 1968 and preceded the ABM. It legitimised the possession of nuclear weapons by five countries — the USA, USSR, Britain, France and China — while other countries were prohibited from obtaining them. In return, the five nuclear powers pledged to help those countries that joined the treaty to develop peaceful uses of nuclear energy. Also, all parties would subject themselves to international standards to guarantee that neither material nor technology was diverted to developing nuclear weapons. One of the significant articles of the treaty, Article VI, observed solemnly that the treaty should lead to comprehensive arms control and disarmament. It was in effect a pledge by the nuclear weapons states to take concrete steps towards elimination of these

weapons.

The NPT was, however, viewed by many countries as discriminatory because it divided the world in two — the nuclear haves and have-nots. Yet a large number of nations signed the treaty. Among the notable non-signatories are India, Pakistan and Israel, all of which are tacitly accepted as nuclear weapon states.

For the skeptics, and India has been in their forefront, it was Article VI that became the lightning rod. For in the ensuing 10 years, instead of moving forward toward arms reduction and disarmament, both the USA and the USSR embarked on a massive weapons build-up for a full decade before realising the folly.

Despite widespread opposition, the NPT was extended indefinitely in 1995 after a reported personal intervention by Nelson Mandela, who convinced the skeptics that despite its drawbacks it was a powerful agent for disarmament.

There is at present a commonly held belief among high-level policy-makers in Washington that there is no need to waste time and effort in negotiating yet another arms control treaty. This stems from similar attitudes among conservative thinkers that arms control agreements are not in the interest of the USA because they handicap the country from developing and deploying the most sophisticated and lethal weapons technology can produce.

Condoleezza Rice, President George Bush's national security advisor, said dismissively that she was looking for a few pages in any future arms control document, not volumes. Later, she backtracked by agreeing to negotiate a mini-treaty called the Moscow Treaty on Strategic Offensive Reductions. The Moscow Treaty talks about reducing strategic nuclear warheads to a level of 1,700-2,000 for each country, but unlike the earlier Start treaties that laid out deep reductions in both nuclear warheads and missiles that carried them, the new treaty is ambiguous about

how or when the reductions would be carried out.

In his testimony before the Senate Foreign Relations Committee in September, 2002, Professor Holdren said that it lacked a timetable for the reductions, other than a final target date of 31 December 2012. In a strange coincidence, it happened to be the same date on which the treaty was scheduled to expire, he added. Subsequently, the USA has shown further ambivalence toward destruction of nuclear weapons by saying it would

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put many weapons in storage, not destroy them.

The general antipathy toward international treaties is also evident in other venues as well. For instance, the US Administration has opposed the adoption of the Kyoto Protocol, which was painstakingly negotiated in order to put some minimal limits on greenhouse gas emissions to combat global warming. It did not join the International Criminal Court and scuttled the adoption of a strength-

ened convention to control biological weapons. The latter is particularly ironic since a huge case has been made about countering bio-terrorism.

The US attitude toward arms control greatly impacted the UN Conference on Disarmament based in Geneva, Switzerland. Known by its acronym, CD, the conference has become totally ineffective. One area where negotiations stalled was on the production of fissile or bomb-grade nuclear material. A treaty cutting off the production of such material called the Fissile Material Cut-off Treaty is clearly in the US interest. However, progress in negotiating such a treaty has been stalled because of US opposition to any agreement to control weapons in space, which is favoured by both Russia and China. In turn, China, which has limited fissile material stock, opposes the FMCT and feels it might have to add more missiles and warheads to counter the increased threat from the US missile defence shield to retain a minimum deterrence. For this, it may need to produce more fissile material.

To complicate matters further, the USA has failed to get its Senate to ratify the Comprehensive Test Ban Treaty which outlaws any further nuclear weapons tests. While the treaty cannot enter into force without the signatures of India and Pakistan, failure of the US Congress to approve it has dealt it a perhaps crippling blow. This is further exacerbated by the recently declared US policy to design so-called mini-nukes which can supposedly carry out precision bombing of deeply buried targets such as underground bunkers. The USA also has not ruled out the possible use of such a weapon against a future Tora Bora, the Afghan caves complex, where Osama bin Laden and other Taliban and Al-Qaeda fighters are allegedly hiding. Such threats to unleash nuclear weapons on non-nuclear nations violate the guarantees proffered under the NPT.

The renewed emphasis on the use of tactical or battlefield nuclear wea-

