LIMITED NUCLEAR WAR, CROSSING THE NUCLEAR THRESHOLD

2/28/2024

"The only winning move is not to play"
Joshua computer about nuclear war, “War Games” movie

“In this last of meeting places
We grope together
And avoid speech
Gathered on this beach of the tumid river.”
“This is the way the world ends
Not with a bang but a whimper.”
The Hollow Men, T. S Eliot

“The whole point of the doomsday machine is lost if you keep it a secret!

Why didn’t you tell the world?”
Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb,
Stanley Kubrick, Peter Sellers

“It’s not the dog in the fight,
It is the fight in the dog that determines the winner.”
South California saying

INTRODUCTION

A February 2020 war game coincided with the first-ever deployment, aboard a USA Navy Ohio-class submarine, of the USA’s new W76-2 low-yield atomic warhead as a sea-launched cruise missile. It has an explosive yield of just 5 kilotons kT of TNT equivalent, which about a third of the 15 kT yield of the “Little Boy” device dropped on Hiroshima, and much lower than the 90 and 455-kT of TNT equivalent warheads on other USA submarine-launched ballistic missiles in the USA Navy’s fleet of 14 ballistic missile submarines [1].

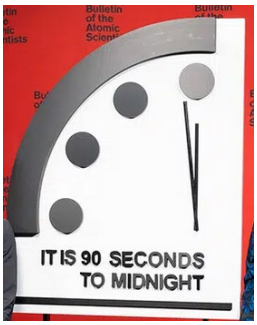

Figure 1. Bulletin of Atomic Scientists Doomsday Clock at 90 seconds to midnight, January 24, 2024.

The USA has about 1,000 weapons in its nuclear arsenal that have low-yield options. This includes nuclear cruise missiles for B-52 bombers and B61 gravity bombs for B-2 bombers and tactical fighter jets. The W76-2 advocates argue that these low-yield warheads are delivered by aircraft that may not be able to penetrate Russia's new advanced air-defenses. The W76-2 on a Trident ballistic missile can.

Nuclear advocates also argue the USA would be constrained from employing fighter aircraft based B61 nuclear bombs or "self-deterred" from employing more powerful strategic nuclear weapons. In addition to penetration of Russian air defenses, there is also the question of NATO alliance consultation and approval of an American nuclear strike. Only a low-yield and quick reaction ballistic-missile can restore deterrence.

RAISING THE NUCLEAR THRESHOLD, ESCALATE TO DEESCALATE E2D STRATEGY

While Russian low-yield nuclear weapons lower the threshold making nuclear use more likely, USA low-yield weapons instead "raise the nuclear threshold" and make nuclear use less likely. Undersecretary of Defense for Policy John Rood even told reporters that the W76-2 would be "very stabilizing" and in no way supports USA early use of nuclear weapons, even though the Nuclear Posture Review explicitly stated the warhead was needed for "prompt response" strike options against Russian early use of nuclear weapons.

"Prompt response" means that strategic Trident submarines in a W76-2 scenario would be used as tactical nuclear weapons, potentially in a first use scenario or immediately after Russia escalated, thus forming the United States' own "escalate-to-deescalate" capability. The United States has refused to rule out first use of nuclear weapons.

President Donald Trump's "Nuclear Posture Review" NPR suggested that it might be possible to fight and win a limited nuclear war with Russia or the Commonwealth of Independent States CIS. The nuclear exchange is assumed to be primarily in Europe and would not escalate into a global exchange. The death toll for both sides being "only" in the tens of millions.

Russia's death toll might be in the tens of millions, but the USA death toll if escalation occurs would be in the one or two hundred million with a limited anti-missile defense and the absence of defense and survival sheltering facilities. Obviously tragic for Russia, but worse so for the USA. Russian tactical and strategic nuclear devices are as numerous as those of the USA, and if targeted, the USA cannot intercept all of them. Russia can stop USA nuclear weapons although some will also slide through their anti-missile defense batteries.

The USA planners' idea and belief are that a potential nuclear exchange would be limited to NATO targets in Europe. Russia would not target the USA in fear of retaliation, and if they did, the "losses would be acceptable".

The tactical W76-2 is essentially little different than the strategic W76-1, "turning off" the thermonuclear secondary and thus facilitating rapid production The United States has consistently refused to rule out first use of nuclear weapons.

THE W76-2 LOW YIELD WARHEAD

According to Amy F. Woolf, Security Analyst at the Congressional Service Office [5]:

> "The Low-Yield D-5 Warhead
>
> The Trump Administration developed a new low-yield version of the W-76 warhead for existing submarine-launched Trident II (D-5) missiles. Unclassified sources state that the existing W76-1 warhead has an explosive yield of around 100 kilotons. The National Nuclear Security Administration (NNSA) has said the low-yield version, the W76-2, would be configured "for primary-only detonation." This could mean a yield of less than 10 kilotons.
>
> Congress appropriated $65 million for the W76-2 warhead in FY2019 and $10 million to complete work in FY2020. It authorized $19.6 million in FY2020 for the Navy to integrate the warhead into the submarine force. NNSA completed the first modified warhead in February 2019, began delivering warheads to the Navy by late 2019, and completed the deliveries during FY2020. The Pentagon reported in February 2020 that the Navy had begun deploying the warheads by that time. NNSA did not disclose the total number produced, although it is likely just a very small portion of the W76 stockpile (estimated, in unclassified sources, to be around 1,300 total warheads).
>
> The Trump Administration introduced the low-yield version of the W76 warhead in the 2018 Nuclear Posture Review (NPR). It cited the need for additional "tailored" and "flexible" capabilities to address the danger of coercive nuclear use, a concept described below, by Russia and North Korea. The NPR stated that this warhead would supplement existing U.S. strategic nuclear capabilities to "enhance deterrence by denying potential adversaries any mistaken confidence that limited nuclear employment can provide a useful advantage over the United States and its allies," and that low-yield warheads would not add to the number of deployed SLBM warheads, but would replace some "higher-yield [SLBM warheads] currently deployed."
>
> The NPR report, and its argument in favor of a low-yield SLBM warhead, launched a debate among U.S. experts about the rationale for the development of such a warhead and the benefits and risks that might accrue from its deployment. While some argue that this warhead is a response to Russia's so-called "escalate to de-escalate" strategy that will strengthen deterrence and raise the nuclear threshold, others contend that it will lower the threshold for U.S. use and increase the risk of nuclear war.

Deterrence vs. Warfighting

The core of the debate over the low-yield D-5 warhead focuses on the question of whether the United States has a gap in its current nuclear deterrent capabilities that can be filled by the deployment of a new low-yield warhead. The 2018 NPR and experts who support the report's assessment argue that adversaries might mistakenly believe the United States would be self-deterred from responding with nuclear weapons after an adversary's nuclear use in a regional conflict, and therefore could be coerced into withdrawing from the fight if an adversary threatened nuclear use. They contend that Russia in particular might threaten to escalate to nuclear weapons if it were losing a conventional conflict, and note that Russia has exercised the use of low-yield nuclear weapons for this type of contingency. They argue that if Russia pursued this approach, the United States would only be able to respond with the higher-yield weapons like those currently deployed on submarine-launched missiles. The deployment of a low-yield D-5 warhead would therefore bolster deterrence by convincing Russia that the United States could respond with a proportional, limited attack.

Critics of the NPR's analysis question whether the United States needs a new weapon to address Russia's mistaken belief that it could threaten escalation without fearing U.S. retaliation. If the belief is mistaken, they argue, then the United States could respond by reasserting and reaffirming its commitment to its allies in Europe, so that Russia would know that this type of threat would not be met with a U.S. or NATO retreat. They also contend that the deployment of new low-yield options could increase the risk of nuclear war because their existence would make it easier for U.S. officials to consider the use of nuclear weapons in a conflict. Some have also argued that there is no "gap" in capabilities because the United States already has low-yield warhead options for gravity bombs and cruise missiles deployed on U.S. and NATO aircraft.

On these latter points, those who support the NPR's analysis have pointed out that the low-yield SLBM could improve survivability and penetration as weapons delivered by aircraft would be vulnerable to an adversary's air defenses. Some also cite the U.S. experience of deploying lower-yield nuclear weapons during the Cold War to posit that there is no evidence that the United States is more likely to use these weapons just because it has them.

The Potential for Limited Nuclear War

The debate has also included discussions about whether a war in which nations used small numbers of low-yield nuclear weapons could remain "limited," or whether it would inevitably escalate to a more extensive nuclear exchange. The NPR's analysis rests on the view that Russian might use a limited number of nuclear weapons if it is losing a conventional war, and that the United States should be able to threaten a limited response to deter Russia. Critics have countered that there is no such thing as "limited" nuclear war because any use of a nuclear weapon would make a conflict something more than limited. Even if the numbers are small and the yields are low, they argue, the damage would be extensive. They have also

argued that nuclear war could not be controlled, so even the limited use of nuclear weapons would risk a global catastrophe.

Some analysts dispute the idea that nuclear war cannot remain limited. Others, however, agree that the use of nuclear weapons would increase the risk of broader escalation and see this as a point in favor of the U.S. deployment of low-yield nuclear weapons. They argue that Russia seems to believe that it could use nuclear weapons in a limited way and deter the United States from responding with its larger warheads. By deploying a low-yield SLBM warhead, the United States would not only aim to convince Russia that the United States would respond after a limited attack, but would also bolster deterrence precisely because Russia's limited use of nuclear weapons could lead to an escalation to a broader nuclear exchange.

In disputing this analysis, some have questioned the NPR's assessment of Russian nuclear doctrine and have countered that the NPR's assertion that Russia has lowered its nuclear threshold is not based on sufficient evidence. They argue that the possible first use of nuclear weapons by Russia and North Korea would likely have less to do with a coercive nuclear strategy intended to deter the United States than with these countries' concerns about U.S. conventional superiority—that they would resort to nuclear weapons because they could not fight and win a conventional war.

The Discrimination Problem

Some experts have posited that the deployment of a low-yield SLBM warhead could create a new "discrimination problem," in which an adversary like Russia would be unable to distinguish during a conflict if an SLBM launched by the United States carried just one low-yield warhead and was not part of a large attack. In this view, a U.S. launch intended to control the escalation of a regional conflict could contribute to Russia's decision to escalate to the strategic level due to misinterpretation and doubts about its early warning systems' accuracy.

Others have disputed this assessment, arguing that the U.S. policy of "limited nuclear options" has historically been, and continues to be, based on assessments that Russia's early warning systems could tell the difference between a single launch and large attack. They contend that Russia would likely delay its response until it had made that assessment. They also claim that the novelty of this "discrimination problem" is overstated because the United Kingdom already deploys low-yield warheads on its SLBMs, and the United States and United Kingdom rely on a "common pool" of Trident II D5 missiles—yet no one has ever claimed that this arrangement might lead to confusion about the size or scale of a U.S. retaliatory attack.

Submarine Vulnerability

Some have advanced the argument that U.S. ballistic missile submarines could be vulnerable to detection after the launch of a single or small number of missiles carrying low-yield warheads because the launch would reveal the boat's

location. Others have countered that the boat would be able to move quickly enough to create a large, possibly daunting search area, making it very difficult for Russia to pinpoint the boat's location with enough confidence to launch a successful attack.

Collateral Damage

Considerations about a potential reduction in collateral damage have also entered into the debate about the development of low-yield SLBM warheads. The U.S. military has generally favored, based on the Law of Armed Conflict, providing the President with nuclear options that have "less collateral effect." By extension, some experts have posited the need for a "nuclear necessity principle," where U.S. nuclear planners would "use the lowest-yield nuclear weapon possible," and only in cases where hardened and buried targets could not be destroyed by conventional weapons. A low-yield D-5 warhead, they argue, would support this goal.

Others counter that the lower-yield warhead and less-stringent use parameters would actually increase the risk of nuclear use in a conflict. This, they argue, would actually increase the risk of nuclear war, and therefore increase the risk of devastating nuclear destruction, possibly in violation of the Law of Armed Conflict."

THE B61-13 WARHEAD, 0.3-50 kT

The Boeing Company designed the B61 device's new guided-tailkit, and 5 rps spin motors giving it additional maneuverability and more precision. But it is a nuclear weapon, that has different yields, from 0.3 kT to 50 kT (0.3, 1.5, 10, or 50 kT) or 0.3-300 kT, depending on the variants, through dialable spiking with a fusion DT or LiD charge. These bombs can detonate beneath the Earth's surface, increasing their destructiveness against underground targets to the equivalent of a surface-burst weapon with a yield of 1.25 MT—the equivalent of 83 Hiroshima bombs. It is a Full Fuzing Option, FUFO weapon, as it is equipped with the full range of fuzing and delivery options, such as air and ground burst, free-fall, retarded free-fall with a parachute and laydown to the ground delivery with a 31 seconds delay. In 2012, the roughly 400 B61-12s will each cost "more than its weight in gold" - $28 million apiece.

Figure 2. Thermonuclear B61-12 gravity high surety warhead equipped with tail fins and back rotational rockets for enhanced accuracy.

Figure 3. Three views of a B61 gravity bomb: assembled in the background, disassembled into its major subcomponents in the middle, and a display of some of the weapon's 5,919 parts in the foreground. The warhead fits inside the blunt-nosed silver canister sitting on the white cloth in front of the partially disassembled bomb. Source: LANL.

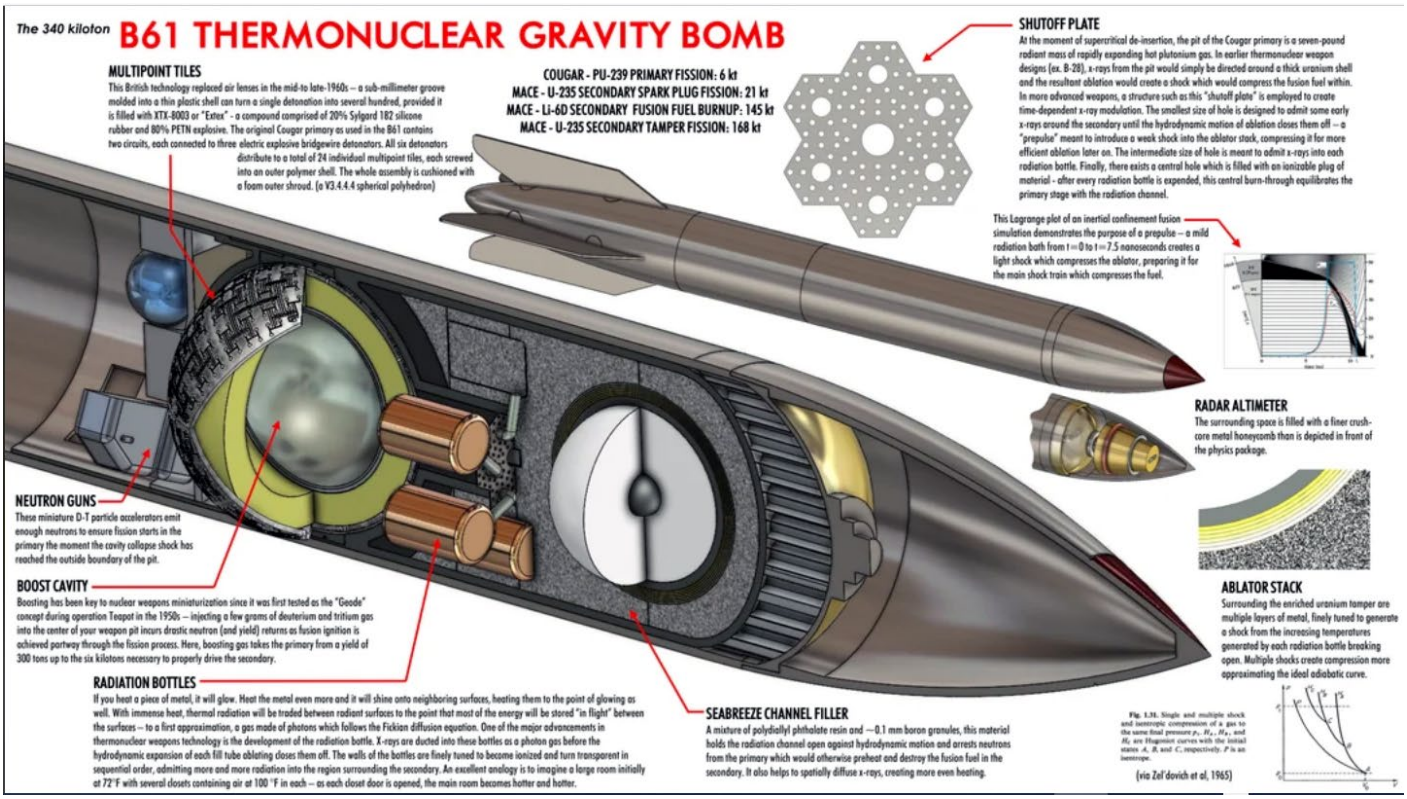

Figure 4. Speculative features of B61 device. Source:Reddit.

The B61-13 thermonuclear gravity bomb can be carried inside the bodies of stealth aircraft and would have a yield similar to the B61-7 and replace some of those older gravity bombs. The B61-7′s yield is higher than the B61-12. The 1.2-Mt B83-1 is the last Mt bomb left in the country's nuclear arsenal and one that would explode with 80 times the force of the bomb dropped on Hiroshima in 1945.

The maximum yield of the B61-7, and by extension the new variant is 0.3-360 kT, while the B61-12 has a dial-up maximum yield of 50 kT. The USA plans to lower the number of B61-12s it will produce by as many B61-13s it builds. The number of gravity bombs in the United States' arsenal is somewhere between 400 and 500. Its deployment will include the B-21 Raider stealth bomber in development with Northrop Grumman.

RUSSIAN MILITARY DOCTRINE

"Russia's security policy dictates that the country would only use nuclear weapons if its very existence were threatened," according to Kremlin spokesman Dmitry Peskov.

The USSR lost nearly 40 million people during WW II, half of them Russian which is about 20 times what the USA lost in all its wars put together. That is a "never again" situation for them and one reason the USSR kept Eastern Europe as a buffer during the Cold War.

Russia is a resource rich country, sparsely populated and with a long, easily penetrable border devoid of natural barriers. It is easy to invade but nearly impossible to hold. It has been the target of major invasions from colonial Western Europeans drooling to appropriate its resources in

1812 and 1941. Only its climate and vast area enabled it to stave off the invaders. If the USA attacks Russia, it will be with sea and air power including nukes, not through a land war.

The USA is the only country with a declared "first strike" policy with nuclear weapons. It would attempt to treat Russia as Rome treated Carthage: total destruction with no acceptance of surrender. Not a single Russian city or town with population of 100 or more would survive. Russia knows this and will go nuclear as soon as war starts. It will “Use them or lose them”.

The Western politicians reckless financing the Ukraine conflict seeks to break up the Russian Federation into several controllable and exploitable entities to control their vast natural resources in a delusional replay of the colonial era.

President Donald Trump’s administration has deployed its submarine-launched 5 kT of TNT equivalent low-yield nuclear warhead, the Pentagon confirmed, marking the first new weapon added to the USA nuclear arsenal in decades. “The USA Navy has fielded the W76-2 low-yield Submarine-Launched Ballistic Missile (SLBM) warhead,” John Rood, the undersecretary of Defense for policy, said in a statement: “This supplemental capability strengthens deterrence and provides the USA a prompt, more survivable low-yield strategic weapon; supports our commitment to extended deterrence; and demonstrates to potential adversaries that there is no advantage to limited nuclear employment because the USA can credibly and decisively respond to any threat scenario” [2].

THE W76-1/Mk4A WARHEAD, TREATY OF MOSCOW

About 3,250 W76 warheads and their associated re-entry body Mk4A were produced between 1978 and 1988. The devices armed the Poseidon C3 and Trident I C4 and the Trident II D5 missiles, together with about 400 W88 warheads. A modified W76 device also arms the Trident II missiles on UK submarines.

The cone shaped Mk4A reentry body is designed to protect the warhead against the heat generation encountered during the fiery reentry through the Earth’s atmosphere.

Under the Strategic Offensive Reductions SORT agreement signed with Russia in 2002, no more than 2,200 strategic warheads may be operationally **deployed** by 2012. However, the total **stockpile** is significantly larger, about two and a half times, and includes an estimated 5,467 warheads.

The Treaty Between the USA and the Russian Federation on Strategic Offensive Reductions, SORT also known as the Treaty of Moscow, was a strategic arms reduction treaty between the USA and Russia that was in force from June 2003 until February 2011 when it was superseded by the New START treaty.

Figure 5. W76 warhead interior layout. Source: LANL

Figure 6. W76/Mk4A reentry body. Source: Sandia National Laboratory.

Under the SORT Treaty, the USA Navy deployed up to an estimated 1,150 warheads on 12 ballistic missile submarines with an average of four warheads per missile. Another two submarines would normally be at port in the overhaul state. Approximately 750 of the warheads were W76-1 with the balance made up by the more powerful W88 warheads.

Because SORT does not set limits on reserve warheads or regulate how Russia and the USA can distribute their nuclear weapons below the ceiling, most of the estimated 5,467 W76-1 warheads were not deployed but kept in storage as a hedge against a nuclear-armed adversary suddenly increasing its nuclear arsenal [3].

THE NEW STRATEGIC ARMS REDUCTION TREATY, NEW START

In force since 2011, the New Strategic Arms Reductions Treaty or New START, Russia and the USA are limited to an equal number of deployed strategic warheads and weapons carrying them, such as Inter Continental Ballistic Missiles ICBMs. To ensure compliance, there are strict counting rules and transparency requirements, giving each side a reliable picture of the other's strategic nuclear forces.

SALT I was followed by SALT II signed in 1979, but never came into force nor ratified. START I (1991-2009) and the Strategic Offensive Reductions Treaty (SORT) (2002-2012). START I went further than SALT I, with limits on all three elements of the nuclear triad, as well as on the number of warheads attributed to them.

The 2019 collapse of the Intermediate-range Nuclear Forces (INF) Treaty left New START as the only major surviving USA-Russia arms control agreement. In early 2021, with the New START due to expire in February 2022 and the two sides deadlocked over the conditions for extending it, it looked as if the last remaining restrictions on the world's two main nuclear powers were about to lapse. Following a last-minute reprieve by newly elected USA President, Joe Biden, the two parties agreed to extend New START until 2026, thereby giving each other welcome breathing space to negotiate a replacement treaty.

ANTI BALLISTIC MISSILE ABM TREATY

Anti-ballistic missiles are designed to intercept ballistic missile warheads and destroy them before they reach their targets. Potentially, they neutralize the deterrent effect of nuclear weapons by allowing an aggressor to block a retaliatory attack and thus enjoy impunity. For this reason, SALT negotiations considered missile defense and offensive nuclear weapons as two sides of the same strategic balance coin. SALT I was therefore flanked by the 1972 Anti-Ballistic Missile (ABM) Treaty, which barred the USA and the USSR from having nationwide missile defenses.

In 1987, the USA and the USSR signed the Intermediate-Range Nuclear Forces (INF) Treaty, which eliminated all nuclear- and conventionally armed ground-launched ballistic and cruise missiles. The INF Treaty defined Intermediate Range Ballistic Missiles, IRBMs and Ground Launched Cruise Missiles, GLCMs) as those having ranges of 1,000 to 5,500 km (620 to 3,400 miles) and Shorter-Range Ballistic Missiles, SRBMs as those having ranges from 500 to 1,000 km. The latter are a particularly dangerous category of weapons as it gave the two sides the capacity to reach targets across the entire European continent.

In February 2019 the USA announced that it was suspending compliance with the treaty.

NUCLEAR POSTURE REVIEW, 2018

President Donald Trump’s administration called for the low-yield 5 kT of TNT equivalent warhead as part of its 2018 Nuclear Posture Review. The administration argued that the warhead is necessary to deter Russia. Moscow, the argument goes, might have miscalculated that the USA was unwilling to use its nuclear weapons in response to a Russian low-yield nuclear strike because the existing USA weapons were too powerful.

“In the 2018 Nuclear Posture Review, the department identified the requirement to ‘modify a small number of submarine-launched ballistic missile warheads’ to address the conclusion that potential adversaries, like Russia, believe that employment of low-yield nuclear weapons will give them an advantage over the USA and its allies and partners,” Department of Defense’s representative John Rood said in a statement.

The warhead is a modification of the existing W76 warhead, which is used to arm submarine-launched Trident II missiles.

Arms control advocates and congressional Democrats, argued that the new low-yield warhead is dangerous and unnecessary. They fear the threshold for the USA willingness to use nuclear weapons will be lowered. They also argue that the USA already had a lower-yield option in its air-launched nuclear weapons.

LIMITED RESPONSE NUCLEAR EXCHANGE MILITARY SIMULATIONS

In late February 2020, the USA conducted a military exercise which simulated a limited nuclear exchange with Russia, a senior Pentagon official confirmed. The war game is notable because of the defense department's highly unusual decision to brief journalists about the details and because it embodied the controversial notion that it might be possible to fight, and win, a limited nuclear exchange with nuclear weapons, without the exchange escalating to an all-out global conflict.

The exercise came just weeks after the USA deployed the new low-yield submarine-launched warhead commissioned by President Donald Trump, as a counter to Russian tactical weapons and intended to deter their use. According to a transcript of a background briefing by senior Pentagon officials, the defense secretary, Mark Esper, took part in what was described as a "mini exercise" at USA Strategic Command in Nebraska. Mark Esper played himself in the simulated crisis, in which Russia launched an attack on a USA target in Europe.

"The scenario included a European contingency where you are conducting a war with Russia, and Russia decides to use a low yield limited nuclear weapons against a site on NATO territory," a senior official said. "And then you go through the conversation that you would have with the secretary of defense and then with the president, ultimately, to decide how to respond." The official said that "in the course of the exercise, we simulated responding with a nuclear weapon", but described it as a limited response.

The limited response could suggest the use of a small number of nuclear weapons, or an existing low-yield weapon, or the new 5 kT W76-2 low-yield submarine-launched missile which was deployed in the Atlantic Ocean for the first time at the end of 2022. The deployment only became public at the end of January 2023.

At the same time as describing the war game, Pentagon officials defended the fielding of the W76-2: "It is a very reasonable response to what we saw was a Russian nuclear doctrine and nuclear capability that suggested to us that they might use nuclear weapons in a limited way," a senior official said.

LIMITED NUCLEAR CONFLICT

The briefing was first reported by National Defense, a trade magazine of the National Defense Industrial Association. Hans Kristensen, the director of the nuclear information project at the Federation of American Scientists, pointed out that it was extremely rare for the Pentagon to give such detailed briefings about nuclear exercises and suggested it could have been a marketing exercise for the new weapons being added to the USA arsenal. "Remember, it is only a few weeks ago that we had the official confirmation that this new low-yield warhead had been deployed," Kristensen said. "And we are now moving into a new budget phase where they have to go to

Congress and try to justify the next new nuclear weapon that has a low-yield capability which is a sea-launched cruise missile. So, all of this has been played up to serve that process."

Advocates of the new USA weapons say they represent a deterrent against Moscow believing it can use a tactical nuclear weapon without a USA response, as Washington would have to choose between not responding, or dramatically escalating through the use of a much more powerful strategic nuclear warhead.

Arms control advocates are concerned that the leadership in both the USA and Russia are developing a mindset in which their vast nuclear arsenals are not just the ultimate deterrent but weapons that could be used to win "limited" conflicts.

USA House Democrats initially included in their initial version of 2022's defense policy bill a ban on deploying the submarine-launched low-yield warhead, but the prohibition was taken out of the final bill signed into law during negotiations with the USA Senate.

In his statement, Defense Department representative John Rood did not say when and where the new warhead was deployed. In an interview with The Associated Press about the deployment, John Rood declined to provide those details, saying they were classified.

The Federation of American Scientists, which first reported the deployment citing anonymous sources, said the warhead was believed to be on the USS Tennessee when it left from Naval Submarine Base Kings Bay in Georgia at the end of 2019 for a patrol in the Atlantic Ocean.

UKRAINE NUCLEAR ARSENAL

The International Atomic Energy Agency, IAEA disclosed that Ukraine was in possession of "100's of kilograms of nuclear weapons grade materials" stored at the now Russian controlled six-unit Zaporizhzhia nuclear power plant.

The thought of a limited nuclear war only killing a few tens of millions is a think-tank telling the military and politicians exactly what they want to hear: The Goldilocks scenario, big enough to get the job done, but not big enough to destroy the whole planet.

In late February 2020 the Pentagon simulated a "limited" nuclear exchange between the USA and Russian forces. In other words, a limited small nuclear war. The simulation, or more accurately, the Pentagon's revelation of the simulation, appears to be part of the USA Defense Department's effort to secure from Congress additional funding for new, low-yield nuclear devices.

Some arms control theorists believe low-yield nuclear weapons are more useful than high-yield weapons. However it is important to note that even a "small" nuclear war could possibly escalate to a global scale and kill tens of millions of people and fundamentally alter life on Earth.

NATO-RUSSIA LIMITED NUCLEAR EXCHANGE, PRINCETON UNIVERSITY SIMULATION

A nuclear war simulation occurred during Secretary of Defense Mark Esper's visit to the headquarters of the USA Strategic Command in Omaha, Nebraska. "We conducted a -- a mini-exercise, if you will," an unnamed "senior defense official" explained in a press conference at the Pentagon.

"The scenario included a European contingency where you are conducting a war with Russia, and Russia decides to use a low yield limited nuclear weapons against a site on NATO territory, and then you go through the conversation that you would have with the secretary of defense and then with the president, ultimately, to decide how to respond," the official said.

“And so they played out that game, and the secretary got a good understanding for how that went.” But even a small nuclear war would kill or injure nearly 100 million people within just a few hours, a team of researchers at Princeton University concluded when they simulated an exchange of low yield “tactical” nuclear weapons between the USA and Russia.

Princeton’s Science and Global Security project team on September 6, 2019, released a video of the simulation, with tiny missiles arcing over continental maps and pinprick blasts erasing cities and countries as the body-count rises, much like in the Hollywood movie: “Wargames”.

The video underscores what experts for years have been saying. There is really no such thing as a small nuclear war. Any wartime use of atomic weapons would escalate into a catastrophic tragedy, even civilization-ending.

The Science and Global Security team developed the simulation to depict what it described as “a plausible escalating war between the USA and Russia using realistic nuclear force postures, targets and fatality estimates. It is estimated that there would be more than 90 million people dead and injured within the first few hours of the conflict.”

The Princeton simulation relies in part on “Nukemap” [4], a public on-line atomic-strike simulator that historian Alex Wellerstein developed [4]: “We live in a world where nuclear weapons issues are on the front pages of our newspapers on a regular basis, yet most people still have a very bad sense of what an exploding nuclear weapon can actually do,” Wellerstein explained.

“This project is motivated by the need to highlight the potentially catastrophic consequences of current USA and Russian nuclear-war plans,” the Princeton team stated. “The risk of nuclear war has increased dramatically in the past two years as the USA and Russia have abandoned long-standing nuclear arms control treaties, started to develop new kinds of nuclear weapons and expanded the circumstances in which they might use nuclear weapons.”

As part of the wider strategic escalation between the two countries, the USA under President Donald Trump has moved to acquire new, smaller-yield nuclear weapons and has begun writing doctrine for employing them even in cases where the threat is non-nuclear.

RUSSIAN NUCLEAR DOCTRINE

The use of tactical nuclear weapons, so-called battlefield nuclear weapons, in the face of overwhelming numerical enemy forces is part of Russia's military doctrine and the use of these tool lies at the discretion of battlefield commanders. When these things start flying the situation may escalate quickly and people will only have a short time to relocate from large, populated areas.

Unlike the Western Nations, except probably for Switzerland, Russia still has bomb and fallout shelters for the general population. The West only has them for their protected well-sheltered few in charge of “continuation of government.” A little-known fact is that Moscow is the only major city in the world that still practices drills to evacuate its citizens into fallout shelters and to its underground metro system. In the west such an effort does not exist.

UK Army chief General Patrick Sanders in February 2024 called on authorities to "mobilize the nation" to prepare for war with Putin, and that the population needs a "shift" in thinking to be ready.

Former Russian president Dmitry Medvedev on the other hand underscored that the Russian response to attack by NATO would without doubt be "asymmetrical". He explained:

> "Since our military capabilities are incomparable, we will simply have no choice. The response will be asymmetrical. To protect the territorial integrity of our

country, ballistic and cruise missiles with special warheads will be used... This will be the proverbial Apocalypse. The end of everything."

This is not the first time that Dmitry Medvedev, known for his bellicose and hawkish rhetoric, has warned of Nuclear Apocalypse. But it is the clearest he has ever spelled out that the Kremlin would not hesitate to activate its nuclear arsenal if Russian territory is directly threatened by NATO.

Former Russian president Dmitry Medvedev has warned that a direct war between Moscow forces and NATO would lead to Nuclear Apocalypse. The Russians do not bluff. They were very restrained in the face of Western challenges, but if they face an existential threat from the West the gloves will come off. Deputy chairman of Russia's Security Council Medvedev just reminded everyone of the official Russian nuclear doctrine:

> "In response to the use of nuclear and other types of weapons of mass destruction against it or its allies, and also in case of aggression against Russia with the use of conventional weapons when the very existence of the state is threatened."

CROSSING THE NUCLEAR THRESHOD, LIMITED NUCLEAR WAR

This is a bad idea, Deverrick Holmes explained for the Center for Arms Control and Non-Proliferation in Washington, D.C. "Embracing the concept of limited nuclear war is folly to the highest degree, and we fool ourselves if we think using low-yield nuclear weapons will somehow help halt the escalation to all-out destruction."

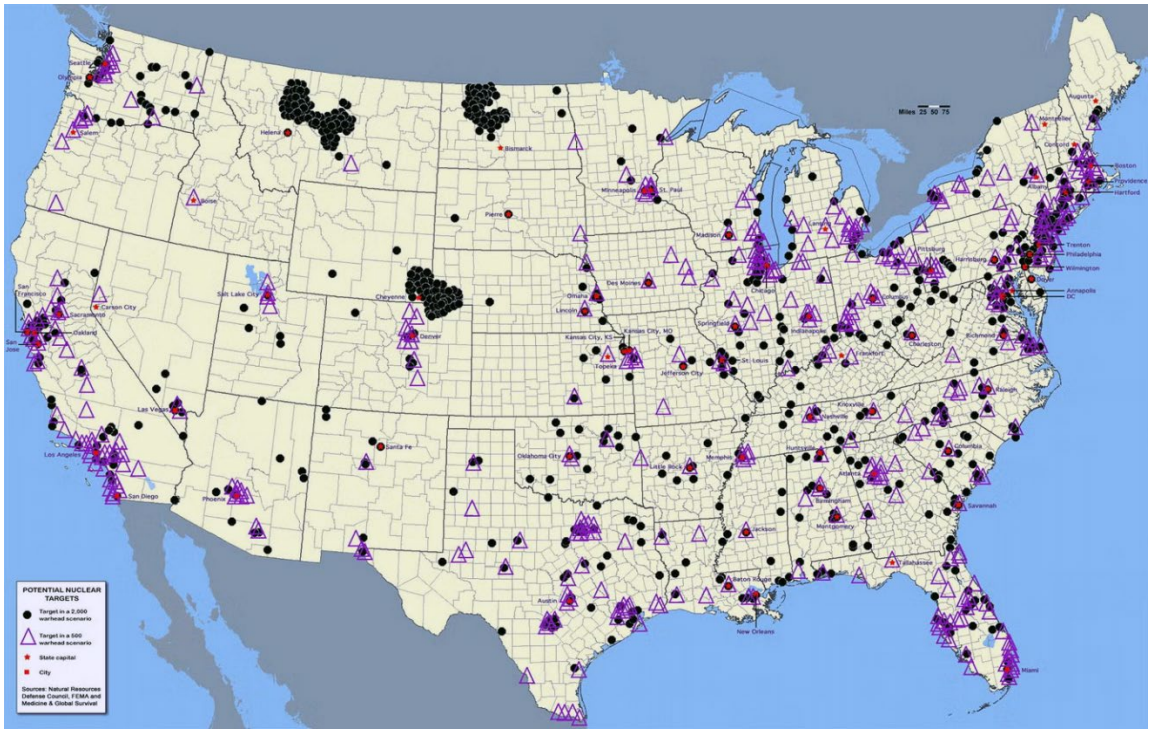

Figure 7. Targeting site in the USA involving cities and Nuclear Power plants. Primary targets would be nuclear power plants, as localized energy suppliers followed by military bases and command centers. While a nuclear weapon has a few pounds of radioactive material and its lethal radiation can only last a few days at the detonation site, a nuclear plant has hundreds of tons of radioactive material that if dispersed into the environment would contaminate entire regions with lethal radiation for tens of years. Source: CBS.

Hans Kristensen, the director of the nuclear information project at the Federation of American Scientists whose Doomsday Clock was set at 90 seconds before midnight in 2023 and 2024, told UK's magazine "The Guardian" that it was unusual for the military to provide so much information on a nuclear war game. The motivation appears to be budgetary.

"Remember, it's only a few weeks ago that we had the official confirmation that this new [W76-2] low-yield warhead had been deployed," Kristensen said. "And we are now moving into a new budget phase where they have to go to Congress and try to justify the next new nuclear weapon that has a low-yield capability which is a sea-launched cruise missile. So, all of this has been played up to serve that process."

The USA has deployed its first low-yield nuclear warhead on a submarine that is patrolling the Atlantic Ocean, it has been reported, in what arms control advocates warn is a dangerous step towards making a nuclear launch more likely.

According to the Federation of American Scientists, the USS Tennessee, which left port in Georgia at the end of 2022 – is the first submarine to go on patrol armed with the 5 kT W76-2 warhead, commissioned by President Donald Trump.

President Donald Trump administration's Nuclear Posture Review (NPR) in February 2018, portrays this warhead as a counter to a perceived Russian threat to use its own "tactical" nuclear weapons to win a quick victory on the battlefield.

Advocates of W76-2 argued that the USA had no effective deterrent against Russian tactical weapons because Moscow assumed Washington would not risk using the overwhelming power of its intercontinental ballistic missiles in response, for fear of escalating from a regional conflict to a global-destroying war.

Critics of the warhead say it accelerates a drift towards thinking of nuclear weapons as a means to fight and win wars, rather than as purely a deterrent of last resort. And the fielding of a tactical nuclear weapon, they warn, gives USA political and military leaders a dangerous new option in confronting adversaries other than Russia.

President Donald Trump's Nuclear Posture Review NPR says the USA could use nuclear weapons in response to "significant non-nuclear strategic attacks", including but not limited to "attacks on USA, allied or partner civilian population or infrastructure".

The USA Navy and Strategic Command did not immediately respond to a request for comment. Hans Kristensen, the director of the nuclear information project at the Federation of American Scientists FAS, said the report on the arming of the USS Tennessee is based on briefings from officials. "We have had conversations with people inside, and they have been pretty clear that this has happened," Hans Kristensen said. "They see a need to talk about it to some extent, because if people do not know it is out there, then how can it deter?"

"This is a very rapid mind quick turnaround for a nuclear weapon, and that is obviously because it was a fairly simple adjustment of an existing warhead," he added. "They have argued that this is to deter Russia, but it also has clear implications or potential use against other adversaries, not least North Korea and Iran."

Hans Kristensen said: “Certainly the low-yield collateral effect that would come from this weapon would be very beneficial to a military officer who was going to advise to the president whether we should cross the nuclear threshold.”

DISCUSSION

Warnings about the implications of nuclear war abound, whether limited or global. Herman Kahn’s study “Thinking About the Unthinkable” describing the implications of nuclear war is worth recalling. How a nuclear attack would be was described 70 years ago in Philip Wylie’s “Tomorrow,” a fictional novel about a nuclear attack on a single city and the power of a nuclear weapon to destroy life and civilization. Stephen Hunter wrote in 1989 the novel “The Day Before Midnight,” in which a Russian nationalist seizes an American ICBM silo in an effort to start a nuclear war. Bill Forstchen wrote a book, “One Second After,” describing how a single device detonated above the continental USA could cause an Electro Magnetic Pulse EMP attack, even if it would not cause casualties, it would be devastating destroying electric and electronic systems sending society back to the Stone Age. A detonation of a neutron activated Cobalt^{60} gamma radiation interdiction device at high altitude would result in organic cells deteriorating into a slow torturing painful death,

Reconsidering President Ronald Reagan 1983 “Strategic Defense Initiative” shunned as “Star Wars” as a defensive alternative and redirecting the structure of Homeland Security towards constructing shelters, and stockpiling protection gear and medical emergency water and food supplies, providing chances of survival in case of nuclear exchanges which have turned in their new nature from being “possible” into being “probable.”

If we are really interested in surviving a nuclear war, we should first spend all effort to not start one. A nuclear World War III would devastate most of the populated world, polluting the atmosphere with nuclear radiation fallout, and killing most human and animal life initially in the Northern Hemisphere. Government services and the economies gradually would grind to a halt. Global air currents would slowly carry the lethal nuclear fallout across the Intertropical Convergence Zone to the Southern Hemisphere. The only parts of the planet still habitable would-be Australia, New Zealand, South Africa, and the southern parts of South America, although they would slowly succumb to radiation fallout as well.

The "Jorgensen Effect", a scientific theory that posits that radiation levels will decrease at a much greater rate than previously thought, aided by the weather effects, and potentially allow for human life to continue in southern Australia or at least Antarctica, may not prove valid. Governments would provide their citizens with free suicide pills and injections so they can avoid prolonged suffering from radiation sickness.

Figure 8. Radiation Fallout pattern and potential nuclear targets on USA's West coast: Seattle, Los Angeles, San Francisco and San Diego. Farcically odd non-military "Counter-value" targets include: Greenbay, Wisconsin, Lansing, Michigan, Albany, New York, Manchester, New Hampshire, and Augusta, Maine. Source: Global Times newspaper, China.

For the USA, in a potential nuclear exchange, outside of Washington D. C. the coastal parts of the country would be secondary targets. People in the interior along Colorado, the Dakotas and Wyoming would face a giant wasteland as the ICBM missiles bases in these areas would be targeted first. Few would survive under Medieval or Stone Age conditions.

Hopefully reason would prevail, and one side would stop at the edge of the precipice. But with uninformed foolhardy people in charge on both sides, they may not stop escalating from a limited exchange to a global one.

The ensuing Electro Magnetic Pulses EMPs would knock out the power grids and cause most USA electrical power plants to be shut down. Lacking electric power, as well as food and water supplies and surviving potential anarchy and a flood of urban refugees to rural areas would be a survival challenge.

Worldwide, the soot generated by resulting fires would shield solar radiation for years resulting in mass starvation into a Nuclear Winter, a possible existential survival threat for all of humanity. Hopefully, upon staring into the abyss, humanity would step back from the brink.

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APPENDIX I

DEAD HAND (PERIMETER)

Martin Zamyatin
https://zamizdat.info/wp-content/uploads/2022/10/Dead-Hand.pdf

"The whole point of the doomsday machine is lost if you keep it a secret!
Why didn't you tell the world?"
Peter Sellers as 'Dr. Strangelove'

It may be one of the few times in American history where a popular movie could be said to have influenced the outcome of a presidential election. Stanley Kubrick's apocalyptic comedy "Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb" was playing to enthusiastic crowds in movie theaters across America in 1964, just as Republican Barry Goldwater was challenging Democratic president Lyndon B. Johnson's reelection. Early in the campaign, Goldwater had imprudently recommended using low-yield nuclear weapons to defoliate forests and destroy supply lines in North Vietnam during the ongoing Vietnam War.

When Goldwater's campaign attempted to appeal to the gut instincts of Americans with the slogan "In your heart, you know he is right," Johnson's campaign responded with the brilliant rejoinder, "In your guts, you know he is nuts!"—or, alternately, "In your heart, you know he might" (as in: he might push the nuclear button). The slogan inevitably called to mind Jack D. Ripper, the psychotic USA Air Force general in Dr. Strangelove, who deliberately sets off a nuclear war. In the movie, the Soviets—about to be attacked with nuclear weapons by USA bombers—reveal to the president the existence of a 'doomsday device,' set to detonate automatically in the event of a nuclear attack on the country.

What most Americans did not (and still do not) know is that the 'doomsday device' was real—and is believed by many USA weapons experts to still be operational. Valery Yarynich served

as a specialist in command, control, and communications in the Soviet Strategic Rocket Forces from 1959 until 1986, and in retirement became a staunch advocate for nuclear disarmament.

In 1984, Yarynich was tasked with fixing problems with a system designed to automatically launch Soviet intercontinental ballistic missiles in a retaliatory strike, should the Kremlin leadership ever be decapitated in a nuclear attack.

The project—which was tested later that year and became operational in 1985—was officially called "Perimeter" but was known among the military brass as "Dead Hand". The initial motivation for building the system was the bellicose rhetoric of USA president Ronald Reagan, as well his destabilizing space-based 'Star Wars' Nuclear Defense Initiative and the USA deployment of advanced, highly accurate submarine-launched nuclear missiles. If launched in close proximity to Russia, these missiles could cut the warning time of a first strike to only about three minutes—insufficient time to mount a counterattack. "Perimeter" was viewed as a low-cost way to counter this threat until Russia's inferior technology could catch up to the West's.

"Perimeter" was not a single device like the Strangelovian Doomsday device, but a large, complex network of interconnected systems. At its core was a commanding rocket with a radiation-hardened radio transmitter which, once launched, would replace all presumably destroyed ground-based communication systems to land and sea-based missiles and strategic bombers.

Even after being activated, the system was not entirely automatic, relying on a low officer in an underground bunker to actually launch the retaliatory strike. In essence, "Dead Hand" was a kind of 'dead man's switch,' automatically enabling a retaliatory strike unless deactivated by an officer or its own computer software. Oddly, few people in Russia's military command knew about the existence of "Perimeter", because leaders feared Western spies would find out about it and cause the USA to devise a way to disable the system.

Realizing that keeping the existence of such a system secret defeated its purpose as a deterrent to nuclear war, Yarynich shared information about "Perimeter" with American nuclear weapons security expert Bruce Blair after the fall of the Soviet Union in 1989. (This was at considerable risk to Yarynich's own security: One Soviet official who previously spoke with Americans about the system had died in a fall down a staircase.) Ironically, the true purpose of "Dead Hand" was not so much to deter the USA from launching a first strike attack, but to deter the Russians themselves from responding to a presumed attack too hastily.

There had been a number of close calls in which either the USA or Soviet military had mistakenly concluded that such an attack was underway, and the existence of the system gave Russian leaders some extra breathing time in a crisis, knowing retaliation would be automatic. According to Yarynich, "Perimeter" was intended "to avoid a tragic mistake."

As recently as 2018, Russian officials confirmed that an upgraded "Perimeter" system still existed and might again become operational in the event the USA continued in its attempts to reinstall nuclear missiles in Europe, as was indeed later the case.

Ironically, Yarynich, who died in 2012 at the age of 75, was once described by fellow anti-nuclear campaigner as: "A Doctor Strangelove who came in from the cold."

APPENDIX II

MEDVEDEV IN BORN TO BE WILD MODE

February 7, 2024

t.me/rocknrollgeopolitics/9921

"Western politicians who have shit their pants and their mediocre generals in NATO have once again decided to scare us. They launched the largest military exercises since the Cold War.

These involve 90,000 soldiers from 31 countries of the Alliance and 'almost block' Sweden, about 50 warships, 80 aircraft, 1,100 ground combat vehicles, including 133 tanks.

Some stages are expected to take place in the most blatantly Russo phobic and most disgusting countries to us, such as Poland, Latvia, Lithuania, and Estonia, that is, in close proximity to Russia's borders.

The NATO blabbers were afraid to directly say who these exercises are aimed against and limited themselves to empty chatter about 'practicing defense plans and deterring potential aggression from the nearest opponents'.

But it is quite obvious that this convulsion of flabby Western muscles is a warning to our country. It's like they're saying, shouldn't we properly threaten Russia and show the Russian hedgehog a fat transgender European ass.

It turned out not scary, but very significant.

After all, if the Alliance itself decided to conduct exercises of this level, it means they are really afraid of something.

And even more so, they do not believe not only in victory but in any military successes of the rotten neo-Nazi regime in Kiev. Plus, of course, they are working out the anti-Russian agenda for domestic political purposes, consolidating their dissatisfied electorate.

Overall this is a very dangerous game with fire.
Significant forces have been assembled. And exercises of this scale have not been conducted since the last century. So they are a well-forgotten old thing.

We are not going to attack any country in this bloc. All reasonable people in the West understand this. But if they play too hard and encroach on the integrity of our country, they will instantly receive an adequate response.

This will mean only one thing - a big war, from which NATO will no longer turn away.

The same thing will happen if any NATO country begins to provide its airfields to Bandera's supporters or quarters its troops with neo-Nazis. They will certainly become a legitimate target for our Armed Forces and will be mercilessly destroyed as enemies.

All those wearing helmets with NATO symbols, who today swaggeringly rattle their weapons not far from our borders should remember this".