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Nuclear First Use: A Critique

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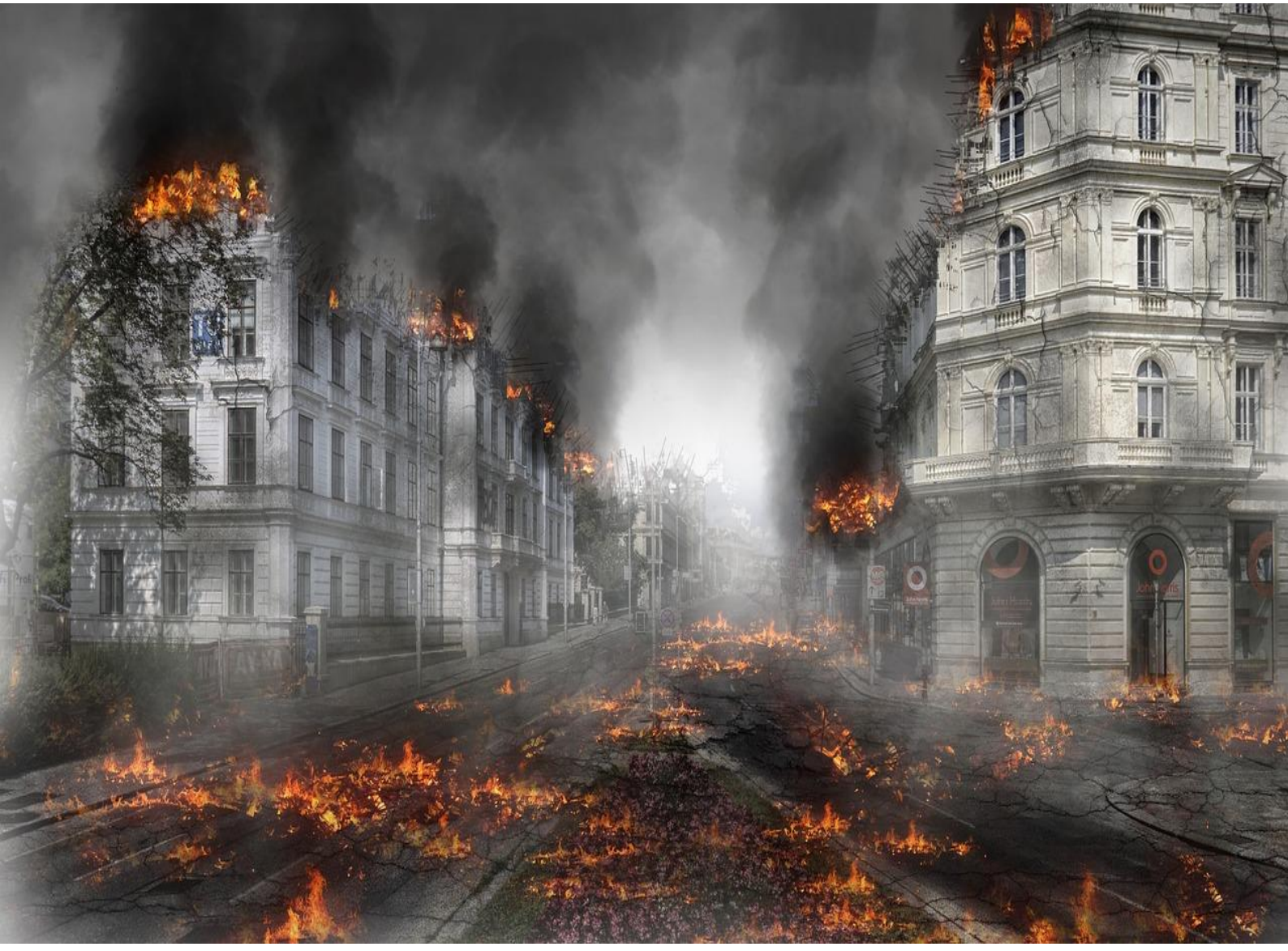

Executive Summary

Six out of the eight nuclear weapons states have not ruled out *first use* of nuclear weapons. This document examines why states choose *first use* policies and the challenges involved in maintaining such a position.

States can be motivated to acquire nuclear weapons for both existential reasons and the pursuit of power. The six motivations for *first use* are: carrying out disarming first strikes, deterring conventional forces, compellence, extended deterrence, preventive strikes, and conquest.

The fundamental problem with *first use* is that it lacks credibility. This is because the path from first detonation to victory is either implausible or overly optimistic. Similarly threats of *first use* lack credibility because they are either disproportionate to the problem at hand or because the possibility of retaliation by the adversary can never be ruled out.

At the same time, *first use* policies fuel the spread of nuclear weapons and prompt existing nuclear weapons states to expand and upgrade their arsenals. The challenge of maintaining strategic stability is compounded by the rise of emerging technologies like hypersonic weapons, artificial intelligence, and counterspace systems, along with the ever-present threat of cyberattacks.

In short, *first use* policies bring few benefits while imposing high costs.

Why States Want Nuclear Weapons

Fear was the central impetus for the American, British, German, Soviet, and Japanese nuclear weapons programmes during the Second World War. Though none of these states could be certain building nuclear weapons was even possible, the mere possibility that others were pursuing such programmes spurred them. Nuclear weapons, like other weapons, are tools of statecraft. Writing in 1981, Kenneth Waltz listed six reasons why states want to acquire nuclear weapons[1]:

- To counter an adversary's nuclear weapons
- Lack of confidence in an ally's reliability
- Lack of a nuclear-armed ally
- Concern about the present or perceived future conventional capabilities of an adversary
- A belief that nuclear weapons are an economical alternative to maintaining large conventional forces
- Offensive purposes

In his piece on why states build nuclear weapons, Scott Sagan explores the other, less obvious objectives. In addition to providing security, nuclear are political objects of considerable importance and can also serve as normative symbols of modernity and identity. Acquiring them allows states to gain legitimacy within the international system. Waltz had also identified this as a seventh motivation in his analysis.

Having examined why states seek nuclear weapons, we now look at why most retain the option of *first use*. Out of the eight declared nuclear weapons states, only China and India have chosen to make *no first use* their declared policy. Both countries encompass vast landmasses and are secure from large-scale invasion by conventional forces. Their nuclear policies have also been driven by civilians who see these weapons as political tools rather than new forms of military firepower. Both China and India contend that nuclear weapons are only suited to deterring other nuclear weapons (though India retains the nuclear option to deter mass attacks by chemical and biological weapons as well).

Strategists from the remaining six openly nuclear powers energetically challenge the rationale of *no first use* in whole or part. In this section, we examine all six reasons, based on Waltz's and Sagan's analysis, and explore why nuclear weapons states have chosen *first use* policies in the past and why some might do so in the future.

Disarming First Strikes

This is a nuclear strike that disables an adversary's nuclear forces and leaves the adversary unable to retaliate in kind. Such attacks may be carried out to gain strategic advantages or to pre-empt similar disarming strikes by the adversary.

Proponents of nuclear superiority – the ability to inflict proportionately greater damage on an adversary – claim that 'superior' states have an advantage over 'inferior' states during brinkmanship[2] as well as actual nuclear conflict.[3]

The Challenges with Seeking First Strike Capabilities

Swollen Nuclear Arsenals: States that fear (or seek the capability to carry out) disarming strikes are forced to build large nuclear forces that can not only survive an initial hit and retaliate but can also pre-emptively defang an adversary. Just months after the Soviets ended America's atomic monopoly, US diplomats worried that "the Kremlin might be tempted to strike swiftly and with stealth"[4]. This mirrored the concerns of the Soviets who not only vowed to repel American attacks but also to deliver "pre-emptive surprise blows, of terrible destructive force."[5]

Worries about arsenal vulnerability persisted through the Cold War despite arms control efforts and the reality of mutually assured destruction. The result was that by 1986, the stockpiles of the US and Soviet Union together totalled nearly 64,000 bombs.[6]

Hair Trigger Alerts and False Alarms: The advent of long-range missiles meant first strikes could be launched with frightening speeds, raising the imperative to keep nuclear forces on hair-trigger alert and raising the incentive to "land the first punch".

It is possible for such false alarms to take place between states with declared *no first use* policies. However, *first use* will not only make these false alarms more

common, it will also heighten the resultant tensions, making panic and fatal lapses of judgement more likely.

A Series of Near Misses

- In 1960, American early warning systems mistook the moonrise over Norway for a massive Soviet missile attack, causing a brief panic.[7]

- At the height of the 1962 Cuban Missile Crisis, an American U2 spy plane lost its bearings and strayed over Soviet airspace. Soviet jets scrambled after the U2. In response, American jets armed with nuclear-tipped air-to-air missiles took off to intercept the Soviets. Luckily, the U2 returned to safety before the shooting could start. Later, Soviet leader Nikita Khrushchev warned that the intrusion of an American aircraft in such an "anxious time" could have easily been mistaken for a bomber spearheading a first strike - and pushed Moscow towards "a fateful step".[8]

- In 1979, US-based early warning systems reported an attack by 2,200 Soviet missiles after someone mistakenly loaded a training exercise tape in the computer system. Khrushchev's successor Leonid Brezhnev was worried enough to secretly correspond with US President Jimmy Carter and tell him these situations were "fraught with a tremendous danger." Nevertheless, in 1980 there were new false alarms, apparently caused by a faulty 46-cent chip.[9]

- False alarms reached a crescendo in 1983, amid heightened tensions, with the Soviets considering a "preemptive strike at the first sign of US preparations for a nuclear strike."[10] On 27 September, an early warning station near Moscow seemingly detected several missiles launched and headed towards the Soviet Union. Fortunately, the man in charge used his judgement and reported a false alarm to his superiors.[11]

- In November 1983, the Soviets feared the annual NATO Able Archer command post exercise simulating the release of nuclear weapons was cover for an actual nuclear attack.[12]

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3. Destabilisation during Crisis: The combination of swollen nuclear arsenals and hair trigger alerts increases the chances of things going wrong during a crisis. By nature, crises are tense. The additional risk of first use can be highly destabilising.

4. Technological Disruption: New technologies create new dynamics and dependencies that are difficult to predict. When combined with first use policies, strategic instability is bound to ensue. Hypersonic glide missiles give little time to react before they strike. Counterspace systems like anti-satellite missiles or various laser/ electronic warfare capabilities can knock out early warning satellites that may be part of a state's ballistic missile defence. Breakthroughs in artificial intelligence (AI) allow it to be incorporated into every aspect of nuclear forces, from intelligence, surveillance and reconnaissance (ISR), to weapons guidance, early warning, and command and control systems. However, AI systems are also prone to crippling failures, which might have unpredictable consequences.

   Under such circumstances, a *first use* policy will only heighten fears about survivability and create additional pressures to increase the size and sophistication of nuclear forces.

5. Uncertainty of Success: The biggest problem with the idea of a disarming first strike is that success will remain uncertain. A state carrying out a disarming strike would need to have overwhelming superiority in nuclear and conventional forces over its intended victim. While some scholars have claimed that a revolution in the accuracy of nuclear missiles have made such strikes more feasible[13], the chance that even a handful of nuclear missiles might get away will give pause to a state planning a first strike. It remains highly unlikely a rational leader would use nuclear weapons this way, even when wielding superior forces.

6. Climate Devastation: Even if a disarming strike was to somehow completely achieve its objectives, success could be as deadly as deadly failure. The extreme temperatures of nuclear explosions cause long-lasting and widespread fires around the blast areas. In the early 1980s, some scientists pointed out that once the black soot from these fires rises into the upper

atmosphere, it blocks solar radiation, causing a "nuclear winter" resulting in catastrophic crop failures and mass starvation.[14]

Recent studies have estimated that even a "limited" nuclear war between India and Pakistan involving fission bombs could deplete the ozone layer and have a devastating impact on global climate.[15] Indeed, the irony is that the climatic impact of limited nuclear use could far exceed the damage caused by the initial blasts and pose an existential threat to states and societies.

While some of these estimates of climatic impact are still being debated[16], it is clear that any attempt at a large-scale disarming strikes using nuclear weapons risks plunging the planet into a climate disaster. A smaller-scale nuclear war between India and Pakistan would pose an existential threat to both countries. A larger nuclear war would threaten humanity itself. These realities make bolt-from-blue strikes much less likely and in turn, reduce the imperative for pre-emptive strikes.

Deterring Conventional Forces

States can use nuclear weapons to hold at risk the conventional forces or population centres of an adversary when under military attack.

The use of nuclear weapons against conventional forces has two effects. One, the blast, heat, and radiation will damage and disrupt the adversary's forces. Two, the use of nuclear weapons will provide a political signal to the adversary to cease military operations or risk further nuclear war. For the signal to be credible, the deterring state must retain enough nuclear forces to be able to absorb a retaliatory strike from its adversary and then hit back at the adversary's strategic targets.

The challenges of deterring conventional forces:

1. The Threat is not credible: States seeking to deter the conventional forces of an adversary are, as Thomas Schelling put it, "manipulating the shared risk of war".[17] The deterring state may attempt to create a plausible pathway from conventional warfighting to nuclear use in the hope that this will deter the attacker. The challenge is that the deterrer has to wield the incredible threat of using nuclear weapons first.

A state deterring non-nuclear attacker has a relatively easy task since the use of nuclear weapons will primarily make the attacker worse off. If Israel's neighbours threaten to overrun it, Israel can threaten Arab cities without fear of nuclear reprisals.

However, it is harder to deter a conventional attack carried out by a nuclear-armed attacker since the mutual rain of nuclear fire would leave both the deterrer and attacker worse off. For the deterring state, carrying out its nuclear threat would be the equivalent of an outlaw pulling the pin on a grenade when a lawman apprehends him. To make this threat seem credible, deterring states have to display a marked preference for death over subjugation.

Furthermore, when the choice at hand involves limited damage rather than subjugation or extinction, nuclear threats lose credibility. Adversaries will remain unconvinced that deterring states are going to risk nuclear escalation in a conflict fought for limited ends.

2. Assuming Intra-War Deterrence: Instead of threatening suicide by murder, states may choose to wield battlefield or theatre nuclear weapons against their adversaries. To make the use of these weapons more credible, states treat them like tools of warfighting, targeting them at the adversary's military forces. These so-called 'sub-strategic' weapons are supposed to provide an intermediate rung on an escalation ladder. They promise to deliver crippling blows to the attacker's war plans while leaving enough nuclear weapons in reserve to deter further escalation.

   The problem is that such "asymmetric escalation" assumes intra-war deterrence even though the presence of nuclear weapons has already failed to prevent conflict. In reality, deterrence will be difficult to maintain once nuclear weapons have been used. Even as the mushroom clouds from the initial nuclear strikes dissipate, the attacking state's original interests would not only remain, they could potentially expand if casualties are horrific.[18] In other words, instead of killing the attacker's risk appetite, nuclear *first use* may only whet it further with the desires to wreak vengeance and win back honour.

3. False Economies: Deterring powers sometimes believe they can trade in expensive manpower and materiel for nuclear weapons, especially

battlefield nuclear weapons. However, deploying nuclear weapons in a war zone adds complications of its own. For one, special arrangements need to be made to safely store and transport the weapons during peacetime. Two, additional command and control systems need to be set up. Three, and most importantly, deterring states need to devote substantial conventional forces to protect battlefield nuclear weapons since they're likely to be priority targets for an adversary.[19]

CASE STUDY III A.

The Problem with Using Nuclear Weapons to Deter Conventional Attacks: The Case of North Korea

While North Korea does not have a publicly articulated nuclear policy, its theory of victory is well understood.[20] In the event of a major conventional war, the country's leader Kim Jong-un would likely launch nuclear strikes against US bases in Guam and Japan while holding the US mainland at risk with his ICBM force. Kim would hope his initial strikes severely degrade American forces while the threat of an all-out nuclear exchange forces the US to de-escalate.

Unfortunately for Kim, his actions are likely to have the opposite effect by providing US decision-makers with the political cover they need to escalate. As the 2019 US Nuclear Posture Review makes clear: "There is no scenario in which the Kim regime could employ nuclear weapons and survive."[21] It is in such circumstances - after nuclear weapons have already been used - that the US will launch a devastating retaliation.

CASE STUDY III B.

The Problem with Using Nuclear Weapons to Deter Limited Threats: The Case of the United States

The latest American Nuclear Posture Review retains the option of using nuclear weapons against "non-nuclear strategic attacks". This is widely interpreted to

include large-scale cyberattacks on nuclear command and control facilities. While cyberattacks on a country's deterrent force is serious matter, the threat of nuclear retaliation is not one the attackers are likely to believe. Besides the challenge of reliably identifying the perpetrators, nuclear retaliation against another nuclear power will cause obvious escalation problems, while using nuclear weapons against a non-nuclear power will be grossly disproportionate and may not achieve the desired goals.

Extended Deterrence

A guarantor state may choose to implicitly or explicitly extend its nuclear umbrella to the ally, enabling it to share some of the strategic benefits of a nuclear arsenal. The great question with extended deterrence is whether the guarantor state will risk its own cities to protect those of an ally.

While extended deterrence does not automatically lend itself to *first use*, the NATO allies of the United States – the sole country that offers a nuclear umbrella – generally believe "first use of nuclear weapons must remain in the quiver of escalation".[22]

The challenges of extended deterrence:

1. Attempts to Establish Credibility Creates More Problems: Extended deterrence demands that the deterring state persuade two distinct audiences -adversaries and allies - of its willingness to defend the allies like it would defend its own people. This is a difficult task and it is natural for the deterring state to over-compensate in its attempts to persuade sceptics from both audiences.

   Proposals for the United States to adopt a *no first use* policy are commonly countered by those who say it will achieve "the worst of all strategic worlds" because allies will believe the pledge and adversaries won't.[23]

   However, the same could be said about option of first use: America's allies might believe it, but its adversaries - especially Russia and China - won't.

To make matters worse, while the option of striking first is not credible enough to deter conventional attacks from an adversary with a second-strike capability, it is enough to generate further tension once a crisis has begun.

2. First Use Makes the Ally a Nuclear Target: Advocates of *first use* argue that in extended deterrence relationships, nuclear weapons offer an alternative to painful conventional war.[24] In any such conflict, the guarantor state would have two nuclear options. One, a limited nuclear strike on the adversary's conventional forces. Two, a large-scale disarming strike that attempts to destroy the adversary's nuclear forces. The fundamental problem with both options is that they risk nuclear retaliation against the guarantor's allies.

   The tragic reality is that once fighting breaks out, the allies of a guarantor state have to choose between conventional conflict and the risk of nuclear devastation. The choice of painless nuclear victory does not exist. Therefore, any ally that does not want to be become a sponge for nuclear strikes would do well to urge its guarantor to adopt abandon the *first use* option.

Advocates of nuclear first use also cite the threat of biological or chemical weapons. But it is possible to retain the nuclear option to counter the threat of large-scale biological or chemical attacks – India's own *no first use* doctrine carves out such an exception.[25]

Similarly, if a *no first use* policy is interpreted as a symptom of a deteriorating alliance commitment, the guarantor state can take simple steps to reassure allies. These will include clear and consistent messaging to both allies and adversaries that reiterate the commitment to common defence, strengthening wider bilateral ties with allies, conducting regular joint military exercises, and bolstering ballistic missile defences.

CASE STUDY IV A.

Massive Retaliation, Flexible Response, and Nervous Allies

The US policy of massive retaliation, first announced in 1954, threatened nuclear responses to Soviet or Chinese attacks on American allies. However, with Soviet nuclear capabilities rising, the policy made little sense by the early 1960s. It after all, strained credulity that the US would rather be dead than see Europe turn red.

The Kennedy administration's solution was 'flexible response', a policy that would provide decision makers more conventional and nuclear options including the use of tactical nuclear weapons. While the declared policy undoubtedly got Soviet attention, historical scholarship shows US leaders also used flexible response to manage politics within the NATO alliance. Tactical nuclear weapons in particular "served a fundamental political purpose" by reassuring nervous allies.[26]

Nervous allies made a comeback in 2016. When the Obama administration considered adopting a no first use pledge, the governments of South Korea, Japan, the UK, and France quietly voiced their opposition and helped kill the idea.[27] While the objections of America's allies appear to stem from a general concern about the credibility of the US nuclear umbrella rather than specifics of doctrine[28], extended deterrence has forced the US into a more aggressive nuclear posture than it needs to secure its global interests.

Compellence

Unlike deterrence, which seeks to prevent an adversary from taking action, compellence is the use of a threat to force an adversary to change the status quo.

Nuclear compellence threatens the use of nuclear weapons. It may be used by a nuclear power against a non-nuclear power or even by one nuclear power against another.

The challenges of compellence:

1. Compellence is Harder than Deterrence: While deterrence asks adversaries to forgo something, compellence requires adversaries give up something they already possess. However, as studies have shown, "measures of willingness to accept greatly exceed measures of willingness to pay".[29] This

makes compellence more difficult to achieve than deterrence in both nuclear and non-nuclear contexts.

2. Establishing Credibility & Resolve: A wide-ranging study from 2017 found nuclear compellence to be rarely successful and "uniquely difficult" whether against nuclear or non-nuclear adversaries.[30] This lack of success was primarily an issue of credibility and resolve. The states seeking to compel usually had less resolve than the subjects of their compellence. Furthermore, the political, diplomatic and military costs of using nuclear weapons was so high that the threats weren't credible.

The compelling state may choose to establish credibility and resolve through acts of nuclear violence. The sole historical case of this was the atomic bombing of Hiroshima and Nagasaki in 1945 which came with the implicit threat that many more cities would face "prompt and utter destruction" if Tokyo did not surrender. [31] While this is evidence compellence might work in rare cases, we should note that some dissenters argue that Tokyo's decision to surrender may have been equally driven by the Soviet declaration of war on Japan, which occurred at the same time.[32]

In summary, the trouble with nuclear compellence is that it is only credible for a narrow band of contingencies where the target state is unable to carry out nuclear retaliation and the stakes for the compelling state are high enough to risk the political (and literal) fallout of nuclear use.

CASE STUDY V A.

Why Compellence will Remain Difficult in the Future

In the future, states seeking to compel may use a demonstrative nuclear strike to establish their credibility early on. The political scientist Paul Bracken imagines an intense conflict between Israel and Iranian proxies. To compel Iran to cease support for the fighters, Israel detonates a nuclear weapon 30,000 metres over Tehran. The resulting explosion "would shatter windows in downtown Tehran," but cause few casualties.[33]

Some also see the combatants in a conflict using nuclear depth charges to target submarines. Underwater explosions far from civilians would make it easier to break the nuclear taboo while delivering a compellent signal to an adversary.[34]

While such actions may offer more credible nuclear threats, they suffer problems of their own. One, detonating a nuclear device is an extreme measure with unpredictable consequences (including radiation fallout from high altitude explosions). Two, when used against other nuclear powers, it would run the same risks of uncontrolled escalation as the strategies of North Korea and Pakistan. (Indeed, the risks would be greater if the adversary did not anticipate such actions as part of a deterrence posture.) Three, when used against a non-nuclear adversary, it will likely entail high diplomatic costs.

Preventive Strikes

A nuclear power may seek to deny another state nuclear weapons capability by striking those facilities with its own nuclear weapons. In such a preventive nuclear strike, nuclear weapons would be used to destroy infrastructure related to a state's nuclear programme.

The challenges of preventive strikes:

The key problem with using nuclear weapons against another country's nuclear facilities is that it offers few military benefits while carrying high diplomatic costs.

The extensive infrastructure needed to make nuclear weapons is vulnerable to conventional military action. Military saboteurs destroyed the Norwegian heavy water plant in 1944, Israeli jets knocked out an Iraqi nuclear reactor in 1981, and later, one in Syria in 2007.[35]

In the early 1960s, the US considered attacks on China's nuclear weapons programme largely using conventional means. While American planners also looked the possibilities of using tactical nuclear weapons, this was primarily because they lacked the precision guided conventional munitions of today. [36]

Recognising this vulnerability to conventional weapons, states like Iran have buried their uranium enrichment facilities deep underground.[37] In turn, the US

has considered with the idea of a 'robust nuclear earth penetrator' to take them out.

However, the case for nuclear bunker busters suffers from the same problems of low military utility and high diplomatic costs. Conventional weapons like the Massive Ordnance Penetrator can do the much the same job as nuclear weapons, while the radioactive fallout from a ground bursting nuclear bunker buster will be large, inflicting international opprobrium on the US.[38]

Finally, using nuclear weapons to destroy another country's nuclear programme could also make the problem more intractable in the long run. Any nuclear destruction is only likely to convince the populace and elites of the target country they need nuclear weapons of their own at any cost.

Civil War and Conquest

The world is fortunate to have not yet seen an "Atomic Hitler" willing to unleash nuclear weapons to conquer territory, target the population concentrations of specific ethnic groups, or suppress internal rebellion. Future despots may see utility in detonating a nuclear device over a rebellious city as a deterrent to others. Warlords in a failed nuclear state might decide to use nuclear weapons against enemy factions. And state leaders could decide a few nuclear detonations would aid the conquest of another state.

Some factors might inhibit or limit such behaviour. Other states will seek to isolate the perpetrator and support its enemies. News of nuclear attacks could become an effective recruiting tool for enemy fighters both foreign and domestic. And the limited effectiveness of nuclear weapons against dispersed forces will become apparent. However, the most powerful antidote for containing the spread of such a malignancy will be a dose of nuclear deterrence. The chief drawback is that since nuclear deterrence cuts both ways, it will inhibit direct offensive action against the nuclear-armed perpetrator.

Conclusion

The invention of nuclear weapons cannot be undone. But the threat of *first use* prompts adversaries to react, sometimes in unpredictable ways. In peacetime, first use policies have the potential to fuel nuclear arms races. In times of crisis or conflict, they heighten tensions and uncertainty, making accidents or

miscalculations more likely. Attempts to use nuclear weapons to deter non-nuclear threats, especially when they don't pose an existential crisis, have a credibility problem which adversaries may be tempted to test.

Considering the problems with *first use,* its persistence is a puzzle best explained by institutional inertia. There is little incentive for bureaucracies to change their ways. While the non-falsifiable proposition that *first use* strengthens deterrence remains entrenched, it is evident that *no first use* is a superior option that would make the world safer.

CITATION INFORMATION

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