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Preventing the (Un)thinkable: Escalation Scenarios and Risk Reduction Measures for Russia and NATO following the War in Ukraine

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1. Introduction

The spectre of war with Russia looms large in the imagination of European and American policymakers in 2022. Since both Russia and NATO-states US, UK and France have nuclear arsenals, the nuclear threat has also returned to the forefront, despite the numerous analyses of many observers over the last decades that nuclear weapons had become irrelevant. The Russian invasion of Ukraine in 2022 has reawakened thinking in terms of risks and ‘escalation’. German Chancellor Olaf Scholz offered such a rationale when he refused to send German tanks to Ukraine.¹ US President Joe Biden has been more willing to supply the besieged Ukrainians with heavy arms, but he too has self-imposed limits to avoid poking the Russian bear.²

Clearly, Putin’s Russia is engaging in brinkmanship and one-sided escalation of the conflict in Ukraine, and thus the risk of escalation must therefore be taken seriously. Keeping citizens and territory safe is the task of NATO and its member-state governments. At the same time, European and American accommodation and acceptance of Russian aggression and threats are a recipe for further escalation from the Russian side and a problematic international precedent to set. As such, we do not advocate acquiescing to Russia, and we maintain that substantial aid to Ukraine is important to help a state and people in need, and to oppose Russian aggression. Simultaneously, however, preventing intentional or accidental escalation through prudent crisis management must accompany this course of action.

Concretely, we ask: which pathways of intentional or unintentional escalation exist between Russia and NATO as a consequence of the war in Ukraine? By “thinking about the unthinkable”³ through the exploration of six escalation scenarios, we identify preventative policies to avoid escalation to major war, potentially even with nuclear arms.

This snapshot explores scenarios of both intentional and unintentional escalation to the nuclear level. It primarily explores the escalation paths resulting from Russian initiative. Still, escalation is often a two-sided and iterative process between adversaries, and as such, the risks of Western actions play a role throughout the scenarios.⁴

First, we explore three scenarios of intentional escalation: (1) a subversive (cyber) campaign against the West that can cause widespread damage; (2) a Russian conventional military strike on NATO supply lines to Ukraine, or on NATO assets; and (3)

¹ Laurenz Gehrke, “Olaf Scholz Cites Risk of Nuclear War in Refusal to Send Tanks to Ukraine,” *POLITICO*, April 22, 2022, <https://www.politico.eu/article/germany-chancellor-olaf-scholz-nuclear-war-tanks-heavy-weapons-ukraine-russia-invasion/>.

² Jack Detsch, “Biden Is Still Worried About Poking the Russian Bear,” *Foreign Policy* (blog), accessed June 14, 2022, <https://foreignpolicy.com/2022/06/08/us-russia-war-ukraine-military-defense/>.

³ This phrase was popularized in the literature on escalation and (nuclear) war by Herman Kahn. See Herman Kahn, *Thinking about the Unthinkable* (New York: Horizon Press, 1962); Herman Kahn, *Thinking about the Unthinkable in the 1980s* (New York: Simon and Schuster, 1984).

⁴ For potential escalatory policies/escalation options on the NATO/US side, see for instance: Benjamin Jensen, “The Coming Storm: Insights from Ukraine about Escalation in Modern War” (Center for Strategic & International Studies, May 26, 2022), <https://www.csis.org/analysis/coming-storm-insights-ukraine-about-escalation-modern-war>.

Russian use of a low-yield, so-called “tactical” nuclear weapon in Ukraine. The Kremlin could take such escalatory steps in order to deter the West from further aid to Ukraine and sanctions against Russia. NATO would face a choice between two evils – lessening support for Ukraine or escalating with the risk of large-scale destruction.

Second, we consider three scenarios of unintentional escalation between Russia and the West: (1) a Russian attack based on erroneous intel; (2) accidental targeting of NATO-assets; and (3) a Western or Russian attack on the other sides’ dual-capable (nuclear and conventional) command and intelligence systems. In the unintentional scenarios, for reasons of space, we will focus primarily on the Russian side. Still, escalation is often a two-sided and iterative process between adversaries, and as such, the risks of Western actions play a role throughout the scenarios and we recognise that unintentional escalation could also result from the NATO-side.

Type of escalation	Scenarios
Intentional escalation	1. Subversive campaign against NATO 2. Strike on NATO assets close to Ukraine 3. Limited nuclear strike in Ukraine
Unintentional escalation	4. Attack based on erroneous intel 5. Accidental targeting of NATO-assets 6. Attack on dual-capable C3I systems

Table 1 Escalation types and associated scenarios.

Given the catastrophic potential results of both deliberate and inadvertent escalation, preventative measures must be a high priority. The first step in this effort is to take brief dive into the literature on escalation.

2. Escalation to war, escalation in war: brief theoretical insights

Escalation is “an increase in the intensity or scope of conflict that crosses threshold(s) considered significant by one or more of the participants”.⁵ Most of the scholarship on escalation was strongly shaped by the Cold War, but recently a new strand emerged in the context of the potentially destabilising effects of emerging technologies and growing geopolitical tensions.⁶ Escalation can be conceived of along both a vertical and a horizontal dimension.

For vertical escalation, the metaphor of a ladder is helpful: the lower rungs include non-violent tools in a conflict such as economic sanctions; higher are minor cyberattacks, and, again higher, conventional skirmishes. As adversaries climb the ladder further, they engage in large scale conventional warfare, and the upper sports of the ladder are occupied by nuclear war if one or more actors possess such weapons.⁷ In horizontal escalation, adversaries do not escalate in a like-for-like manner: a cyberattack may be reciprocated with sanctions or with a conventional counterattack. States have agency in how they escalate; however, they do not control how their adversary interprets their escalation. States that escalate can lose control or unintentionally cross lines. To further unpack the concept of escalation dynamics, we distinguish three categories of escalation: intentional, inadvertent and accidental.

2.1 Intentional escalation

Escalation, or a threat to escalate, is an intuitive and millennia-old strategy. In the context of it being used intentionally, it can be subdivided into instrumental and suggestive escalation. In the Ukraine War, the recent Russian decision to deploy heavy artillery and massive heavy reinforcements in the fierce fighting in the Donbass region was an example of instrumental escalation to gain an upper hand. Russia’s nuclear signalling is an example of a threat of suggestive escalation to achieve political and psychological effects.⁸ Important characteristics of intentional escalation are that the escalating state

⁵ Forrest E. Morgan et al., “Dangerous Thresholds: Managing Escalation in the 21st Century” (RAND Corporation, July 8, 2008), <https://www.rand.org/pubs/monographs/MG614.html>.

⁶ Over the last decade, escalation theory has been ‘reinvented’ and mostly applied to analyze the risks and policies concerning Emerging Disruptive Technologies, such as Artificial Intelligence, weaponization of space, cyberwarfare, and hypersonic missiles. See inter alia James M. Acton, “Cyber Warfare & Inadvertent Escalation,” *Daedalus* 149, no. 2 (April 2020): 133–49; Mariel John Borowitz, Lawrence Rubin, and Brian Stewart, “National Security Implications of Emerging Satellite Technologies,” *Orbis* 64, no. 4 (January 1, 2020): 515–27; James Johnson, “Inadvertent Escalation in the Age of Intelligence Machines: A New Model for Nuclear Risk in the Digital Age,” *European Journal of International Security*, October 15, 2021, 1–23.

⁷ Herman Kahn, *On Escalation. Metaphors and Scenarios* (New York: Praeger, 1965); see also Herman Kahn, *On Thermonuclear War* (Princeton University Press, 1960).

⁸ Andrew Roth et al., “Putin Signals Escalation as He Puts Russia’s Nuclear Force on High Alert,” *The Guardian*, February 28, 2022, sec. World news, <https://www.theguardian.com/world/2022/feb/27/vladimir-putin-puts-russia-nuclear-deterrence-forces-on-high-alert-ukraine>.

is in control, and that the steps are perceived as escalatory by all parties involved. Adversaries can manipulate when and how to escalate in order to achieve their political and military goals, they also manipulate the thresholds, the so-called “red lines”, they set for what counts – according to them – as escalation. One can communicate a threshold, but if the adversary does not believe that a crossing of that threshold will result in significant negative effects, he can still cross it. Thus, the threshold needs to be clear, and the threat of retaliation for its crossing equally clear and backed up by real capacities. Alternatively, one can remain intentionally vague about the escalation threshold, in the hopes that the adversary will err on the side of caution. If an adversary crosses a threshold, the state that established the threshold either has to accept the new situation and its consequences; or communicate a new threshold and raise the stakes in the hopes of (re)establishing deterrence; or actually carry out the threat and escalate.

In the Russian-Ukrainian War, Putin’s invasion of Ukraine crossed the US and Europe’s communicated threshold (although that threshold was clearly not backed by a pledge that they would intervene militarily), as did his repeated nuclear sabre rattling. At the same time, the Kremlin has communicated thresholds to the West, warning against Western interventions and tampering with the conflict. Russian behaviour can also be described as brinkmanship: “manipulating the shared risk of war”,⁹ where a state uses escalatory behaviour and rhetoric while being vague about the exact threshold that would lead them to climb the escalation ladder further. Brinkmanship strategies can be used to coerce an adversary into risk-avoiding policies and compliance; when even nuclear weapons are involved as the highest escalation ‘rung’, those risks are high indeed.

Given the continuously rising stakes surrounding Ukraine, it is important to note that brinkmanship can spin out of control. This is referred to as unintentional escalation – which is outlined next.

2.2 Unintentional Escalation

Unintentional escalation can be subdivided into inadvertent or accidental forms. The former entails that the escalating party takes steps that are not intended as escalatory, but are regarded as such by the opponent. This can, for instance, transpire as a result of a misunderstanding and unclear signalling between adversaries, or from unintended side effects experienced by the opponent.¹⁰ Accidental escalation refers to conflicts spiralling out of control due to actions beyond the direct control of leaders and governments or due to their decisions being based on faulty information. Examples include failing Command and Control (C2) when troops in the field make mistakes and autonomously attack enemy targets without orders or authorization to do so. In the sections below we offer three examples each for both intentional and unintentional escalation.

⁹ Thomas C Schelling, *Arms and Influence* (New Haven: Yale University Press, 1966), quote on p.99. see also Tim Sweijts, Artur Usanov, and Rik Rutten, *Back to the Brink: Escalation and Interstate Crisis*, HCSS Strategic Monitor 2016 (The Hague Centre for Strategic Studies, 2016), particularly 43-44.

¹⁰ Seminal work on inadvertent escalation was done, in the Cold War context, by Barry Posen; see Barry R. Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks* (Cornell University Press, 1991), also Barry R. Posen, “Inadvertent Nuclear War?: Escalation and NATO’s Northern Flank,” *International Security* 7, no. 2 (1982): 28-54.

3. Intentional escalation scenarios

In the context of the war in Ukraine, President Putin and his regime have clearly engaged in intentional armed escalation against Ukraine, have crossed the West's escalation thresholds – triggering sanctions – and have threatened with armed escalation against the West as well. From the war's start, the Kremlin has sought to deter the West from helping Ukraine, with threats of decreasing natural gas deliveries, most explicitly through its nuclear sabre rattling. Whether as a result of Putin's threats or due to other factors such as the unwillingness to sacrifice own troops, the West has indeed refrained from staging an armed intervention on the Ukrainian side.¹¹ However, in Russia's view, the US and Europe have also escalated since the war's beginning in February. The actions of NATO-states and their allies can be best described as helping Ukraine to the extent possible without triggering a full-blown war with Russia. Western governments are probing the Kremlin's thresholds with the combined impact of tightening sanctions packages; (support for) cyber operations;¹² heavier weapon deliveries to Ukraine and training Ukrainian forces on how to use them;¹³ intelligence support to the Ukrainian government and its forces; as well as the Finnish and Swedish accession process to NATO;¹⁴ and the EU-candidate status of Ukraine and Moldova.¹⁵ The US and Europe are slowly but steadily climbing the escalation ladder if measured by the thresholds that the Kremlin has formulated.¹⁶

This is not to necessarily say that the West should not take such steps. As stated above, aid to Ukraine and resistance against Russian aggression is important. Rather, the implications of the observations above are that Russian leaders are weighing whether

¹¹ The limited-intervention variant of a 'no-fly zone', floated by many security experts in March, was also ruled out. See for instance Tom Enders, "The Case for a No-Fly Zone in Western Ukraine," POLITICO, March 15, 2022, <https://www.politico.eu/article/case-no-fly-zone-western-ukraine/>; Justin Bronk, "A Ukraine No-Fly Zone Would Be Ineffective, Dangerous and a Gift to Putin," RUSI, March 10, 2022, <https://rusi.org/explore-our-research/publications/commentary/ukraine-no-fly-zone-would-be-ineffective-dangerous-and-gift-putin>.

¹² Laurens Cerulus, "EU to Mobilize Cyber Team to Help Ukraine Fight Russian Cyberattacks," POLITICO, February 21, 2022, <https://www.politico.eu/article/ukraine-russia-eu-cyber-attack-security-help/>; Reuters, "Six EU Countries Send Experts to Help Ukraine Deal with Cyber Threats," Reuters, February 22, 2022, sec. World, <https://www.reuters.com/world/six-eu-countries-send-experts-help-ukraine-deal-with-cyber-threats-2022-02-22/>; Sean Lyngaas, "US Confirms Military Hackers Have Conducted Cyber Operations in Support of Ukraine," CNN, June 2, 2022, <https://www.cnn.com/2022/06/02/politics/us-hackers-ukraine-support/index.html>.

¹³ Western arms deliveries have increased in number and impact – from small arms deliveries in the first weeks, to the recent arrival of modern advanced German self-propelled howitzers and American multiple rocket launcher systems. See David Brown, Jake Horton, and Tural Ahmedzade, "Ukraine Weapons: What Military Equipment Is the World Giving?," BBC News, July 1, 2022, sec. Europe, <https://www.bbc.com/news/world-europe-62002218>.

¹⁴ See Andrew Roth, "Putin Issues Fresh Warning to Finland and Sweden on Installing Nato Infrastructure," The Guardian, June 29, 2022, sec. World news, <https://www.theguardian.com/world/2022/jun/29/russia-condemns-nato-invitation-finland-sweden>.

¹⁵ Reuters, "Russia Says EU Candidate Status for Ukraine, Moldova Will Have Negative Consequences," Reuters, June 24, 2022, sec. Europe, <https://www.reuters.com/world/europe/russia-eu-candidate-status-ukraine-moldova-will-have-negative-consequences-2022-06-24/>.

¹⁶ See for instance "Russian UN Envoy Sees 'Clear Escalation' in Western Deliveries of Heavy Weapons to Kiev," TASS, accessed August 1, 2022, <https://tass.com/world/1463197>.

their escalation thresholds are crossed. They could decide that Western actions are seriously threatening Russia's strategic goals and that the West is insufficiently deterred by Russia's current threats, that regime can decide to raise the stakes. The more effective American and European support is for Ukraine on the battlefield, and the more effectively Western sanctions hurt Russia's military ability, the more Putin could intentionally escalate the conflict. Below, three scenarios for such intentional escalation are explored.

3.1 Scenario 1: Subversive campaign against the West

In order to deter the West, Putin's Russia could directly target the West by intensifying its cyberattacks and public influencing campaigns, combined with other impactful types of subversive attacks such as assassinations of dissidents, and the sabotage of underwater infrastructure. Hostile actions below the threshold of war ('hybrid warfare' or 'grey zone warfare', with plausible deniability) have been a key element in Russia's strategy against NATO over the past decade.¹⁷ In doing so, Russia can impose costs on the US and Europe. This would force American and European leaders to make a cost-benefit decision. First, they could acquiesce, by scaling down the aid and sanctions in order to preventing further damage to their own societies. Or second, they could defy Russia, continue existing policies, and accept the damage. The damage from massive cyberattacks or sabotage of critical infrastructure – such as crucial subsea cables – could paralyse societies and have serious societal, political, and military repercussions. The effects of such massive 'sub-threshold warfare' start to resemble actual warfare more and more.¹⁸ American and European leaders could respond through a third route, namely by retaliating and climbing the escalation ladder as well. They have started to formulate escalation thresholds for subversive attacks. The head of the British armed forces Admiral Radakin has warned that Russian targeting of crucial underwater communication cables could be considered an "act of war".¹⁹ NATO has signalled that massive cyberattacks can trigger the alliance's collective defence mechanism in the cyber domain and potentially even in the physical domain.²⁰

¹⁷ James K. Wither, "Making Sense of Hybrid Warfare," *Connections* 15, no. 2 (2016): 73–87; Clark Mason, "Russian Hybrid Warfare" (Washington, DC: Institute for the Study of War, 2020). On cyberattacks: a major Russian cyber campaign was conducted against Lithuania over sanctions impacting Kaliningrad, see Andrius Sytas, "Russian Group Claims Hack of Lithuanian Sites in Retaliation for Transit Ban," *Reuters*, June 27, 2022, sec. Technology, <https://www.reuters.com/technology/lithuania-hit-by-cyber-attack-government-agency-2022-06-27/>. On public influencing campaigns, including disinformation and collusion with Western political parties, see for instance Mason Richey, "Contemporary Russian Revisionism: Understanding the Kremlin's Hybrid Warfare and the Strategic and Tactical Deployment of Disinformation," *Asia Europe Journal* 16, no. 1 (March 1, 2018): 101–13; Beatrix Futák-Campbell, "Political Synergy: How the European Far-Right and Russia Have Joined Forces Against Brussels," *Atlantisch Perspectief* 44, no. 1 (2020): 30–35; On the threats to cables, see Frank Bekkers et al., "The High Value of The North Sea" (The Hague Centre for Strategic Studies (HCSS), September 2021), <https://hcss.nl/report/high-value-of-the-north-sea/>; "Russia Cripples NATO's Undersea Communications," *Warsaw Institute* (blog), January 17, 2022, <https://warsawinstitute.org/russia-cripples-natos-undersea-communications/>.

¹⁸ Lawrence J. Cavaiola, David C. Gompert, and Martin Libicki, "Cyber House Rules: On War, Retaliation and Escalation," *Survival* 57, no. 1 (January 2, 2015): 81–104.

¹⁹ P. A. Media, "UK Military Chief Warns of Russian Threat to Vital Undersea Cables," *The Guardian*, January 8, 2022, sec. UK news, <https://www.theguardian.com/uk-news/2022/jan/08/uk-military-chief-warns-of-russian-threat-to-vital-undersea-cables>.

²⁰ NATO, "NATO Will Defend Itself (Article by NATO Secretary General Jens Stoltenberg Published in Prospect)," NATO, August 27, 2019, http://www.nato.int/cps/en/natohq/news_168435.htm; James Pearson

Still, the Russian leadership can decide to take the risk. If both sides continue this determined and retaliatory stance, the two sides would enter a 'tit-for-tat' action-reaction cycle, resulting in serious structural damage to societies involved.²¹ As widespread damage blurs the line between subversive attacks and actual warfare, Western leaders could then threaten with, or actually carry out, limited military escalation in the hopes of breaking the cycle.²² As such, a massive Russian subversive campaign has the potential not only do widespread damage, but could eventually also bring Russia and the West to the brink of direct armed confrontation.

3.2 Scenario 2: Russian strike against NATO assets

The Kremlin has already threatened the West with escalation if NATO forces involved themselves directly in Ukraine, to coerce the West to stopping the arms deliveries to Ukraine.²³ Given the fact that the US and Europe have continued the deliveries, Russia could consider a missile strike on Western arms convoys, airports, ports or other assets directly involved in these supplies to shore up the credibility of Russian coercive threats. Similarly, given the significant effect of Western intelligence assistance to Ukrainian operations,²⁴ Russia could also target NATO's reconnaissance assets, such as reconnaissance planes that operate close to Ukrainian and Russian airspace and over the Black Sea.²⁵

But for Russia, this would be a very risky strategy. How NATO would respond is uncertain. Historical examples show that such attacks are particularly dangerous during a crisis. For instance, the Soviet downing of an American U2 reconnaissance plane near Cuba during the Cuban Missile Crisis (1962) worsened the crisis that brought the world to the brink of a (thermonuclear) war.²⁶ If Russia were to accept these risks and engage in a limit attack against NATO assets, the West could alternatively: (1) scale down arms

and Jonathan Landay, "Cyberattack on NATO Could Trigger Collective Defence Clause - Official," Reuters, February 28, 2022, sec. Europe, <https://www.reuters.com/world/europe/cyberattack-nato-could-trigger-collective-defence-clause-official-2022-02-28/>.

²¹ Michael Fitzsimmons, "Horizontal Escalation: An Asymmetric Approach to Russian Aggression?," *Strategic Studies Quarterly* 13, no. 1 (2019): 95–133.

²² See for instance Herbert Lin, "Escalation Dynamics and Conflict Termination in Cyberspace," *Strategic Studies Quarterly* 6, no. 3 (2012): 46–70.

²³ Rory Sullivan, "Nato Transport Carrying Weapons in Ukraine Is a 'Target', Warns Russia," *The Independent*, May 4, 2022, sec. News, <https://www.independent.co.uk/news/world/europe/russia-nato-weapons-deliveries-ukraine-b2071337.html>; Russia has already overtly targeted western arms deliveries in Ukraine's territory: Peter Beaumont and Julian Borger, "Russian Airstrikes Target Western Arms Arriving in Ukraine," *The Guardian*, May 4, 2022, sec. World news, <https://www.theguardian.com/world/2022/may/04/russian-airstrikes-target-western-arms-arriving-in-ukraine>.

²⁴ The New York Times reported, for instance, that the sinking of the Russian Black Sea Flagship 'Moskva' by Ukraine was aided by US intelligence: Helene Cooper, Eric Schmitt, and Julian E. Barnes, "U.S. Intelligence Helped Ukraine Strike Russian Flagship, Officials Say," *The New York Times*, May 5, 2022, sec. U.S., <https://www.nytimes.com/2022/05/05/us/politics/moskva-russia-ship-ukraine-us.html>.

²⁵ see for instance The Editorial Board, "Opinion | Upgrading America's Eyes in the Sky," *Wall Street Journal*, May 4, 2022, sec. Opinion, <https://www.wsj.com/articles/upgrading-americas-flying-binoculars-awacs-ukraine-russia-us-nato-11651256560>.

²⁶ The Soviet Union had already downed a U2 spy plane over the Soviet Union (1960) See for instance Dino A. Brugioni, *Eyes in the Sky: Eisenhower, the CIA, and Cold War Aerial Espionage* (Annapolis: Naval Institute Press, 2011); Michael Dobbs, *One Minute to Midnight: Kennedy, Khrushchev, and Castro on the Brink of Nuclear War*, Illustrated edition (New York: Vintage, 2009), *passim*.

shipments and intel, which de facto rewards Russia's escalation; (2) it could continue supplying arms and other aid, thereby risking further Russian attacks on Western military personnel; or (3) it could retaliate and signal Western resolve, risking further escalation. Particularly, if the attacked country – for instance Poland or Romania – is a NATO member state, it can attempt to invoke the collective defence Article 5 of the North Atlantic Treaty. Since its inception, Article 5 has been understood as the ultimate American guarantee to European states, which potentially includes escalation to the nuclear level.

3.3 Scenario 3: Sub-strategic nuclear employment: Russian 'escalate to deescalate'

In the context of the Ukraine War, it is unlikely but not impossible that Russia would use so-called "tactical" low-yield nuclear weapons.²⁷ It seems particularly unlikely that Russia would strike Western assets or territory with nuclear weapons, since the US, UK and France have the ability to respond with nuclear means. However, there are paths for limited Russian use of low-yield nuclear weapons against and in Ukraine. Based on the assumption that small nuclear strikes – limited in death toll, destruction and radiation – will not lead to uncontrollable nuclear escalation, Russian doctrine outlines the possibility of such limited strikes in order to freeze a conflict.²⁸ Limited nuclear escalation strategy is designed to have military, political and psychological effects. For NATO, ironically, this should not be unfamiliar terrain; during the Cold War, when the conventional balance of power was the reverse of the current situation, NATO employed the same doctrine to make up for Soviet and Warsaw Pact conventional preponderance. NATO would deliberately climb the escalation ladder with limited nuclear strikes against Warsaw Pact troops, in order to signal to the Soviets that NATO was ready to cross the strategic nuclear threshold and force the Soviet Union to negotiate.²⁹

Russian rhetoric and the use of dual capable weapon systems in military exercises over the past decades has given reason to believe that Russia could also use its selective nuclear strikes concept in aggressive operations.³⁰ The Russian strategy in the 2014 Crimea Crisis, and in the failed 2022 *Blitzkrieg* to take over Ukraine, both followed the playbook of swiftly creating a military *fait accompli*. In response, either the target state

²⁷ For takes from the Ukrainian president Zelensky and US officials, see Jeremy Herb, "Exclusive: Zelensky Says World Should Be Prepared for Possibility Putin Could Use Nuclear Weapons," CNN, April 16, 2022, <https://www.cnn.com/2022/04/15/politics/tapper-zelensky-interview-cnntv/index.html>; see also "Ukraine War: Could Russia Use Tactical Nuclear Weapons?," BBC News, April 26, 2022, sec. World, <https://www.bbc.com/news/world-60664169>.

²⁸ Dmitry Adamsky, "Deterrence à La Ruse: Its Uniqueness, Sources and Implications," in NL ARMS Netherlands Annual Review of Military Studies 2020: Deterrence in the 21st Century—Insights from Theory and Practice, ed. Frans Osinga and Tim Sweijts, NL ARMS (The Hague: T.M.C. Asser Press, 2021), 161–75.

²⁹ Rob De Wijk, *Flexibility in Response? Attempts to Construct a Plausible Strategy for NATO. 1959-1989*, Ph.D. Thesis (Leiden University, 1989); John P. Rose, *The Evolution of U.S. Army Nuclear Doctrine, 1945-1980* (Boulder: Westview Press, 1980).

³⁰ As reported for instance after the 2009 "West" exercise: Matthew Day, "Russia 'simulates' Nuclear Attack on Poland," The Telegraph, November 1, 2009, <https://www.telegraph.co.uk/news/worldnews/europe/poland/6480227/Russia-simulates-nuclear-attack-on-Poland.html>; for a critical reflection on this point, see Bruno Tertrais, "Does Russia Really Include Limited Nuclear Strikes in Its Large-Scale Military Exercises?" (International Institute for Strategic Studies, February 2018), <https://www.iiss.org/blogs/survival-blog/2018/02/russia-nuclear>.

and NATO acquiesce to the new reality or they must accept the risks of further escalation if they attempt to return to the territorial status quo ante.³¹

An air-burst detonation of a low-yield nuclear weapon above Ukraine would send a powerful signal that Russia believes its vital interests to be at stake and that it is ready to cross the 'nuclear threshold' to defend them. Though it could be used to destroy a Ukrainian military or civilian target, the primary purpose would be political and psychological. The objective for Russia would be to coerce Kyiv into concessions and deter NATO from any further involvement. However, any nuclear use would be an unequivocal crossing of international normative and political thresholds. It would likely cause many countries that are currently non-aligned in the Ukraine conflict to turn away from Russia. In most conceivable circumstances, the costs for Russia would be too great, but if Ukrainian counter-offensives threaten to overrun Russian forces, Ukraine destroys targets on Russian territory,³² or Russia already is entirely isolated internationally, the Kremlin's calculations could change.

Russian nuclear use would be a catastrophe in and of itself, but it is also dangerous because of the uncertainty about the US, British, and French response. There would be few proponents of substantial retaliation against Russia, not only to avoid further escalation, but also because there is no formal obligation to defend Ukraine. However, American and European leaders would also be apprehensive about not responding to Russia's breaking of the nuclear taboo at all. Doing nothing or backing down would reward Russian nuclear aggression - a disastrous international precedent. To prevent Russia or other nuclear states from using the same nuclear 'escalate to de-escalate' in the future requires a serious signal. Responding with a nuclear strike against Russia would likely be considered too dangerous, but conventional attacks at Russian assets elsewhere, such as Russian forces in Syria and at sea, would be in the realm of possibility.³³ Yet, even such a lower-intensity response still brings multiple nuclear-armed powers into direct military conflict. Such a crisis, with nuclear weapons as a Damoclean sword dangling over leaders' heads, could quickly escalate beyond the control of the parties involved. Mutual understanding and trust between Moscow and NATO capitals is at a historic low, particularly in the nuclear domain, heightening the risk of misinterpretation and miscalculation.³⁴

³¹ Kristin Ven Bruusgaard, "Crimea and Russia's Strategic Overhaul," *Parameters* 44, no. 3 (2014): 81-90; on fait accompli strategies in general, see Dan Altman, "By Fait Accompli, Not Coercion: How States Wrest Territory from Their Adversaries," *International Studies Quarterly* 61, no. 4 (2017): 881-91.

³² Concerns about this possibility likely underly US President Biden's decision to block the shipment of US armaments with the range to reach Russia Dan Sabbagh, "Biden Will Not Supply Ukraine with Long-Range Rockets That Can Hit Russia," *The Guardian*, May 30, 2022, sec. World news, <https://www.theguardian.com/world/2022/may/30/biden-will-not-supply-ukraine-with-long-range-rockets-that-can-hit-russia>. Russia has claimed in several instances that Ukraine is attacking targets in Russian territory: Henri Astier, "Ukraine Blamed by Russia for Deadly Blast in Border City of Belgorod," *BBC News*, July 3, 2022, sec. Europe, <https://www.bbc.com/news/world-europe-62025541>.

³³ Fitzsimmons, "Horizontal Escalation."

³⁴ Dmitry (Dima) Adamsky, "From Moscow with Coercion: Russian Deterrence Theory and Strategic Culture," *Journal of Strategic Studies* 41, no. 1-2 (February 23, 2018): 33-60.

4. Inadvertent and accidental escalation

Up to this point, we have discussed how escalation follows deliberate choices by adversaries. Yet, bellicose rhetoric intended for domestic audiences, attacks on conventional targets that increase uncertainty, as well as other actions can add to the volatility of the standoff. These elements are also available in the Russian-Ukraine War, whether in the form of threats from the Kremlin, increases in NATO's conventional presence in the eastern member states, or statements by the U.S. Secretary of Defense Austin that America intends to permanently 'weake[n] Russia'.³⁵ The presence of not one, but multiple triggers that can lead to miscalculations, heightens the risk of a perfect storm that leads to escalation.³⁶ We offer three such scenarios below.

4.1 Scenario 1: Attack based on erroneous intel

Great powers are constantly collecting intelligence on other major powers. In brinkmanship-type stand-offs, when time and information on the other side's capacities and intentions are particularly of the essence, intelligence agencies and armed forces will be particularly active. Yet, in such circumstances of high stakes, uncertainty and low mutual trust, decision-makers are particularly prone to confirmation bias of malign intent on the part of their adversary and likely to disregard information to the contrary.³⁷ Military manoeuvres or troop concentrations can be interpreted as a preparation for an attack rather than a military exercise. For example, in 1983, during the highest Cold War tensions since the Cuban Missile Crisis, Soviet leaders were alerted that NATO was conducting a nuclear attack procedures test. Historical research has shown that the Kremlin may have wrongly suspected this exercise was a NATO pretext for nuclear war preparations - a misinterpretation that moved the Kremlin dangerously close to a preventative nuclear strike.³⁸

Similarly, wrong information can be interpreted as correct, particularly if it points towards hostile intentions from the adversary. Also in 1983, a Soviet strategic early warning system reported on incoming nuclear missiles from the US. The system's commander suspected a system error and did not report the warning to his superiors, quite possibly saving the world.³⁹

³⁵ Natasha Bertrand et al., "Austin's Assertion That US Wants to 'weaken' Russia Underlines Biden Strategy Shift - CNNPolitics," CNN, April 26, 2022, <https://edition.cnn.com/2022/04/25/politics/biden-administration-russia-strategy/index.html>.

³⁶ See for instance the scenario in "Blundering into a Nuclear War in Ukraine: A Hypothetical Scenario," *The Nuclear Threat Initiative* (blog), accessed July 4, 2022, <https://live-nuclear-threat-initiative.pantheonsite.io/atomic-pulse/blundering-into-a-nuclear-war-in-ukraine-a-hypothetical-scenario/>.

³⁷ For an introduction, see inter alia Richard Ned Lebow and Janice Gross Stein, "Rational Deterrence Theory: I Think, Therefore I Deter," *World Politics* 41, no. 2 (1989): 208-24; Janice Gross Stein, Richard Ned Lebow, and Robert Jervis, *Psychology and Deterrence* (Baltimore: Johns Hopkins University Press, 1989), particularly 18-22.

³⁸ John Lewis Gaddis, *The Cold War: A New History* (New York, 2005), 227-28.

³⁹ Lawrence Freedman and Jeffrey Michaels, *The Evolution of Nuclear Strategy: New, Updated and Completely Revised* (Springer, 2019), 532.

Intelligence failures and miscalculations, coupled with low trust and little mutual understanding, can also take place in the context of the current stand-off over the war in Ukraine.

4.2 Scenario 2: Accidental targeting of NATO-assets

In the fog of war, mistakes can happen. In the context of the heightened military presence in the region, Russia and NATO countries can accidentally target the others' assets, as a result of ineffective Command and Control (C2) or failing military systems. For instance, the accidental or unwarranted downing of a Western airplane –civilian or particularly military – by Russian or pro-Russian troops could trigger an escalation to war. This has happened before; Russian forces (probably erroneous) downed civilian airliner MH17 above eastern Ukraine (2014),⁴⁰ and Soviet air defences shot down the civilian Korean Air Lines Flight 007 (KAL007) in 1983 on the edge of Soviet airspace. Both incidents, rooted in insufficient control of the Kremlin over its local armed forces, caused and contributed to geopolitical crises.⁴¹ This can happen again for instance near Ukrainian air space or above the Black Sea. Vice versa, NATO-forces could also make such mistakes. A similar historical precedent is the US Navy's accidental downing of an Iranian civilian airliner during the Iran-Iraq War (1988).⁴²

Similarly, Russian or pro-Russian forces could accidentally launch missiles into the territory of NATO member states – such as Poland, Slovakia, Hungary, or Romania - while aiming at Western Ukraine. Russian has already repeatedly attacked Ukrainian targets near NATO borders.⁴³ The accuracy of Russian missiles has been underwhelming and it is not farfetched that a missile could land in NATO territory due to an internal malfunction or due to targeting mistakes by local commanders.

Of course, the most catastrophic but also unlikely C2 failure scenario would be the unwarranted use of a nuclear weapon. One hopes that the near-catastrophes of the Cold War have led to nuclear C2 reform in Russia and nuclear-capable NATO states. Yet, it is difficult to say whether the untransparent nuclear procedures are fail-safe under high pressure against unauthorized use.

The effect of accidental or unauthorised Russian aggression against Western states is difficult to predict. It would partly depend on the damage done; if widespread, NATO leaders could advocate forceful responses. To clarify Russian intentions regarding the attack, the quality of NATO's intelligence collection and communication with Russia play crucial roles. The US has communicated red lines and planned responses, hoping to

⁴⁰ Cees van Doorn and Theo Brinkel, "Deterrence, Resilience, and the Shooting Down of Flight MH17," in *NL ARMS Netherlands Annual Review of Military Studies 2020: Deterrence in the 21st Century—Insights from Theory and Practice*, ed. Frans Osinga and Tim Sweijs, NL ARMS (The Hague: T.M.C. Asser Press, 2021), 365–83.

⁴¹ Gaddis, *The Cold War*, 227.

⁴² "Iran Air Flight 655 | Background, Events, Investigation, & Facts | Britannica," accessed August 1, 2022, <https://www.britannica.com/event/Iran-Air-flight-655>.

⁴³ Reuters, "Missiles Destroy Military Infrastructure in Western Ukraine near Polish Border, Governor Says," Reuters, May 15, 2022, sec. Europe, <https://www.reuters.com/world/europe/missiles-destroy-military-infrastructure-western-ukraine-near-polish-border-2022-05-15/>.

deter risky Russian behaviour; President Biden's National Security Advisor Jake Sullivan stated after a Russian missile strike in Western Ukraine that any attack on NATO territory would prompt a full force response from the alliance.⁴⁴ An accidental or unwarranted Russian attack on a NATO F-16 or on Polish territory could therefore not only lead to outrage and demands for reparations, but could also represent the opening stage of a rapid spiral of armed retaliation by NATO against Russia.

4.3 Scenario 3: Attack on entangled C3I-systems

Within a conventional conflict, a physical or cyber-attack on the adversary's command posts, delivery systems, early warning satellites and other systems that make up Command, Control, Communications and Intelligence (C3I) infrastructure can render enemy forces and their leadership figuratively deaf, blind, and mute, unable to communicate among themselves. For obvious reasons, this carries huge benefits during a war, like the one in Ukraine.

However, C3I-systems used for conventional warfare often also play a key role in operations in the nuclear domain. Both on the Russian and the NATO sides, space-based early warning satellites and communication infrastructure are often also used to detect nuclear attacks, identify nuclear targets, and facilitate communication with nuclear-capable units. Such 'entangled' assets, crucial to both conventional and nuclear capabilities, are a major potential source of inadvertent escalation.⁴⁵ A cyberattack or a conventional missile strike disabling mentioned systems renders an enemy blind to nuclear attacks. Both Russia and the US could interpret such sudden system failures as a precursor to a nuclear strike or a disarming strike against their nuclear arms. Similarly, a Ukrainian attack against entangled Russian infrastructure could be misinterpreted by the Russians as having been carried out or facilitated by NATO and the start of a first strike on Russia's nuclear arsenal. A crippling attack against dual-capable C3I-systems can rapidly undermine strategic stability between Russia and NATO. Technological improvements had resulted in the fact that over the last decades, the time available to respond to a potential nuclear attack has become shorter and shorter. Intense time pressure, unclear information and low trust can lead to disastrous decisions, such as preventative strikes.

⁴⁴ Luke Harding, Peter Beaumont, and Lorenzo Tondo, "Russia Targets Ukrainian Military Base near Polish Border in Escalation," *The Guardian*, March 13, 2022, sec. World news, <https://www.theguardian.com/world/2022/mar/13/russia-widens-attacks-on-ukraine-with-missile-strike-on-base-close-to-polish-border>.

⁴⁵ James M. Acton, "Escalation through Entanglement: How the Vulnerability of Command-and-Control Systems Raises the Risks of an Inadvertent Nuclear War," *International Security* 43, no. 1 (August 2018): 56–99. For an analysis that concludes that the risk of entanglement and inadvertent escalation is not as serious, see: Matthew Kroenig and Mark J. Massa, "Are Dual-Capable Weapon Systems Destabilizing? Questioning Nuclear-Conventional Entanglement and Inadvertent Escalation," *Atlantic Council Report* (Snowcroft Center for Strategy and Security, 2021), <https://www.atlanticcouncil.org/wp-content/uploads/2021/06/Nuclear-Entanglement-IB-v7.pdf>.

Cf. Michael T. Klare, "Cyber Battles, Nuclear Outcomes? Dangerous New Pathways To Escalation," *Arms Control Today* 49, no. 9 (2019): 6–13.

5. Conclusions and recommendations

Given the potentially disastrous impact of intentional and unintentional escalation scenarios, risk reduction measures to prevent or mitigate escalation are essential.⁴⁶

Table 1 below summarises the scenarios, identifies goals or causes of escalation in each scenario, describes escalation pathways and identifies policy implications.

Characteristics	Goal or cause of escalation	Escalation pathways	Policy implications for NATO
Scenario			
1. Subversive campaign against NATO	Compel NATO to stop arms deliveries and sanctions	<ul style="list-style-type: none"> - Russian cyberattacks, physical attacks against cables and infrastructure. - Serious strategic-level damage in NATO - NATO tit-for-tat retaliation against Russia, retaliation cycle 	<ul style="list-style-type: none"> - Strengthen resilience and deterrence against covert attacks (cyber, subsea, etcetera) - Prepare and decide on playbooks for calculated responses.
2. Strike on NATO assets close to Ukraine	Compel NATO to stop arms deliveries, intelligence support	<ul style="list-style-type: none"> - Limited Russian attack against NATO aircraft, airfield, forces etc. - NATO choice: acquiesce, ignore, or escalate - acquiescence can lead to Ukrainian defeat - ignoring attack can embolden further attacks - escalation can lead to direct NATO conventional (or nuclear) conflict with Russia 	<ul style="list-style-type: none"> - Keep a publicly low profile about arms - Review and practice procedural preparations for intra-NATO crisis consultation processes - Prepare and decide on playbooks for calculated responses.
3. Limited nuclear strike in Ukraine	Compel Ukraine to concede defeat, compel NATO to stop aid	<ul style="list-style-type: none"> - Putin's cost-benefit analysis tips towards nuclear signal strike - Russia executes limited nuclear strike in Ukraine - NATO choice: acquiesce, ignore, or escalate - acquiescence can lead to Ukrainian defeat and rewards nuclear aggression - escalation means conventional or nuclear retaliation against Russian assets, has medium to high likelihood start world war - also possible: NATO miscalculation and panic 	<ul style="list-style-type: none"> - Continue to signal unacceptability of nuclear use, also with non-aligned states - Develop horizontal retaliation options - Review and practice procedural preparations for intra-NATO crisis consultation processes, specifically in the nuclear domain

⁴⁶ See also: Carnegie Corporation of New York, "How Can We Avoid Further Escalation of the International Conflict Caused by Russia's Invasion of Ukraine? | Emerging Global Order," Carnegie Corporation of New York, accessed June 14, 2022, <https://www.carnegie.org/our-work/article/how-can-we-avoid-further-escalation-of-the-international-conflict-caused-by-russias-invasion-of-ukraine/>.

4. Attack based on erroneous intel	<i>Faulty hardware, mistakes in intelligence service</i>	<ul style="list-style-type: none"> - Russia is on alert, monitoring for potential attacks from NATO - Russia comes to believe attack is imminent or took place - Kremlin orders anticipatory strike on non-existing threat (could also transpire vice-versa, with an erroneous attack from NATO/a NATO-state) 	<ul style="list-style-type: none"> - Make sure the Moscow-Washington hotline is functioning - Communicate intentions, presence and location of NATO-member state airplanes and vessels near Ukraine and Russia specifically.
5. Accidental targeting of NATO-assets	<i>Ineffective Command and Control (C2)</i>	<ul style="list-style-type: none"> - accidental Russian targeting of NATO assets (planes, territory, armed forces) - or nuclear strike by Russian troops unauthorized by Kremlin - if NATO misinterprets this as real attack, fails to deescalate, or damage is enormous: retaliation and aggression cycle similar to cases above. 	<ul style="list-style-type: none"> - Prepare capabilities for de-escalation and crisis management to prevent retaliation against inadvertent attack - Invest in detection systems, attribution systems, intelligence capabilities to prevent misattribution/misunderstanding - Guard for imprudent behaviour by small and middle powers that could drag the Alliance into war - Disentangle C3I assets to the extent possible
6. Attack on dual-capable C3I systems	<i>Entangled (conventional-nuclear) C3I systems</i>	<ul style="list-style-type: none"> - cyberattack or physical attack against C3I systems, either by NATO or by Russia (or by Ukraine, misattributed as NATO) - victim misinterprets attack as prelude to nuclear strike or conventional strike against nuclear assets - victim engages in preventative conventional or nuclear strike - unleashes large-scale war 	

Our main take-away is that NATO as a whole, and NATO-states individually, must maintain a balance between distinct objectives: do not cave to unacceptable threats, as accommodation is a recipe for further escalation from the Russian side. Provide the Ukrainian government with aid it needs to defend its people and sovereignty. Yet, they must be careful not to respond to further Russian escalation in kind, and avoid taking steps that increase overall belligerence and lower the barrier for systemic war onset. Unity within and between the US and Europe is essential.

Ultimately, European and North-American leaders cannot persuade or deter the Russian government from choosing to intentionally escalate. That decision is made in the Kremlin. Yet, to reduce the likelihood and to reduce the protentional effects of any such decision, they can take a number of measures. Preventing unintentional escalation requires clear communication of intentions and policies, and a conscious effort to not raise tensions further.

Specifically, NATO must take care to:

- Communicate escalation thresholds to Russia, beyond which NATO will respond in force. This includes a clear commitment to defend NATO-territory. At the same time, refrain from both escalatory and ambiguous language.
- Maintain a robust military presence on NATO's eastern border to deter any Russian aggression against the alliance and its members but communicate presence and intentions clearly to Russian leadership.
- Continue to signal unacceptability of further aggression against the sovereign territory of other states and particularly the unacceptability of nuclear use, also in cooperation with non-aligned states.
- Develop horizontal retaliation options against Russian escalation, including cyberoperations against non-essential infrastructure and horizontal retaliation options against Russian assets elsewhere in the world.
- Review and practice procedural preparations for intra-NATO crisis consultation processes. Communicate to Russian leadership, however, that these are not preparations for war initiation.
- Signal NATO's resolve and capacity to swiftly and effectively respond to any aggression, but at the same time, remain calm and prudent in times of crisis to guard against escalating to war following an unintended attack.
- Communicate the presence and location of NATO-member state airplanes and vessels near Ukraine and Russia specifically, to prevent misidentification and misreading of intentions. This does not apply to weapon transfers to Ukraine.
- Invest in detection systems, attribution systems, intelligence capabilities to prevent misattribution/misunderstanding of e.g. incoming missiles or cyberattacks.
- Disentangle C3I-systems for nuclear and conventional use.
- Draw a clear line between supplying weapons to Ukraine on the one hand, and actual NATO military involvement on the other. Do not supply arms that require NATO-member forces to operate them (e.g. Patriot SAM-batteries). Do not order NATO-forces to engage in direct warfare with Russian forces. Keep a publicly low profile about arms deliveries.
- Strengthen resilience and deterrence against covert attacks (cyber, subsea, etcetera).
- Make sure the Moscow-Washington hotline is functioning, even if current Russian leadership shows little interest in using it.