



RESEARCH DIVISION
NATO DEFENSE COLLEGE – ROME

NDC RESEARCH PAPER

No. 22 – December 2021

Challenges to NATO's nuclear strategy

edited by Andrea Gilli



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NATO Defense College – NDC Research Papers Series

Series editor: Thierry Tardy
Copy-editing: Mary Di Martino
English editing: Caroline Curta, Susan Vo

NDC Research Paper 22 – 2021
“Challenges to NATO’s nuclear strategy”
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Keywords

Deterrence, Nuclear Weapons, Nuclear Strategy, Modernization, Arms Control, Nuclear Sharing.

Nota Bene

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ISSN: **2618-0057**
ISSN (online): **2618-0251**



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Printed and bound by <http://www.lightskyconsulting.com/>

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Acknowledgments

This *NDC Research Paper* reproduces some of the research presented in the 2020 edition of the NATO Defense College Research Division's Early-Career Nuclear Strategists Workshop (ECNSW). I am thankful to the senior scholars who delivered presentations and provided comments to the early-career scholars: Målfrid Braut-Hegghammer, Bruno Tertrais, Heinrich Brauss, Elaine Bunn and Jessica Cox. Jessica Cox deserves a special mention for her critical support to the success of the Early-Career Nuclear Strategists Workshop.

Andrea Gilli

Contributors

Jessica Cox serves as Director, Nuclear Policy Directorate at NATO HQ in Brussels, Belgium. She provides policy support to NATO Secretary General on matters related to NATO nuclear deterrence, including in the Secretary General's role of Chair of the Nuclear Planning Group. Prior to her NATO assignment, Ms. Cox was a policy analyst in the US Department of Defense. She recently completed two years at the National Security Council as the Director for Arms Control, where she led the development of US policy on nuclear and conventional arms control treaties as well as issues associated with US-Russia and US-China strategic stability.

Rhys Crilley is a postdoctoral researcher in the Department of Politics and International Relations at the University of Glasgow, Scotland. His current research project "Narratives of Nuclear Weapons: How Emotions Shape Deterrence and Disarmament" is funded by the Leverhulme Trust. It explores the dynamics of the new nuclear age by looking at narratives and emotions in policies of deterrence and efforts towards disarmament. Rhys holds a Ph.D. in International Relations from the University of Birmingham, and prior to joining the University of Glasgow he worked at The Open University and the University of Warwick. Rhys has published widely on the intersections of security, social media, and popular culture, in journals such as *International Studies Review*, *Intelligence and National Security*, *International Journal of Press/Politics*, and the *Hague Journal of Diplomacy*.

Nicolò Fasola is doctoral researcher at the University of Birmingham and Teaching Assistant at the University of Bologna. His main research areas are Russia's security policy, NATO, and security sector reform in formerly Communist countries. Prior to his current roles, Nicolò was Adjunct Lecturer at the University of Salford (2020), Visiting Doctoral Researcher at Saint Petersburg State University (2019), and Researcher with UniAdrión (2019). He also worked with the Italian Embassy in Estonia (2017) and NATO Supreme Headquarters Allied Powers Europe (SHAPE) (2018, 2020-2021). Nicolò's latest publication is "Reforming Ukraine's Security Sector" (*Survival*, 2021, with Alyssa J. Wood).

Andrea Gilli is Senior Researcher at the NATO Defense College where he works on issues related to technological change and military innovation. He has been visiting and post-

doctoral fellow at Johns Hopkins University and Columbia University as well as Stanford University (where he remains an Affiliate) and Harvard University. Andrea has worked or conducted research for the US Department of Defense, the Italian Air Force, the Italian Government, the Italian Ministry of Foreign Affairs, the Preparatory Commission for the Nuclear Test-Ban Treaty Organization, the Royal United Services Institute, the European Union Institute for Security Studies and Metropolitan University Prague, among others.

Jenny Oberholtzer is a Ph.D. candidate in International Relations at the University of St Andrews, researching military chaplaincy. Prior to her doctoral programme, she worked as a defense analyst, war game designer and red teamer at the RAND Corporation for several years. She is a graduate of UC Berkeley and National Intelligence University. She is currently based in Aarhus, Denmark.

Alexander Sorg is a Ph.D. researcher at the Centre for International Security and Teaching Assistant for Ambassador Wolfgang Ischinger at the Hertie School in Berlin. His research interests include nuclear weapons, alliances, and assurance. In his doctoral thesis, he is focusing on the reasons for, and the effects of, foreign deployed nuclear weapons. He studied European studies in the Netherlands and Spain and holds a Master of International Affairs from the Hertie School.

List of abbreviations

BTGs	Battalion Tactical Groups
CNA	Center for Naval Analysis
CBRN	Chemical, Biological, Radiological and Nuclear
CDU	Christian Democratic Union
DCA	Dual-Capable Aircraft
EDD	Escalate to De-escalate Doctrine
FDP	Free Democratic Party
INF	Intermediate-Range Nuclear Forces Treaty
NATO	North Atlantic Treaty Organization
PSI	Pound-force per Square Inch
SNOWCAT	Support of Nuclear Operations With Conventional Air Tactics
TEL	Transporter Erector Launcher
UK	United Kingdom
US	United States
VJTF	Very High Readiness Joint Task Force
WMD	Weapons of Mass Destruction

Introduction

Andrea Gilli and Jessica Cox

In 2022, NATO will present its new Strategic Concept. Since 2010, when the previous Strategic Concept was published, NATO and the world have changed significantly. At the time, NATO was primarily engaged in crisis management, including in operations in Iraq and Afghanistan. The Strategic Concept enabled the Alliance to further expand – conceptually and geographically – its out-of-area activities, together with the core tasks of cooperative security. Eleven years later, the dominant paradigm of international politics is great power competition: in other words, countries like Russia and China are competing with the West strategically, economically, militarily, and in terms of values. Many things have remained constant, however: one is the centrality of nuclear weapons for NATO's deterrence and defence posture. Since 2010, Allies have continued to affirm that as long as nuclear weapons exist, NATO will remain a nuclear alliance, notwithstanding the Alliance's ultimate goal of a world free of nuclear weapons.

The 2020 edition of the Early-Career Nuclear Strategists Workshop, which took place at the NATO Defense College while NATO was involved in its 2030 Reflection Process, addressed some of the key issues which NATO and its Allies will have to tackle as they consider the Alliance's future nuclear weapons policy and posture.

Niccolò Fasola, in his chapter, examines Russia's nuclear doctrine and reassesses the dominant wisdom on its assumptions, tenets and hypotheses. Using both abstract and logical analysis, as well as deductive-driven empirical methods, Fasola questions some of the understanding surrounding Russia's nuclear doctrine, posture and strategy. He begins with a brief review of the arguments at the basis of the so-called "Escalate to De-escalate Doctrine" (EDD). After analysing the potential coherence of the concept with the current Russian military *modus operandi*, he further explains why the EDD concept may not represent current Russian strategy on the use of nuclear weapons during conflicts. Rather, Fasola argues that Russia is likely to use nuclear weapons only in the concluding phases of a large-scale conflict, and invites future researchers to look for a better understanding of Russian contemporary strategic thinking.

Alexander Sorg provides an analytical summary of the nuclear sharing debate in

Germany. Opposition to nuclear weapons within the German public has been growing over the past decades. However, nuclear weapons are a key pillar of NATO deterrence and defence posture. How can these apparently contrasting dynamics be reconciled? Sorg argues that Germany could withdraw from NATO's nuclear-sharing arrangements. But this would require additional commitments in other areas, for instance, a substantial increase in defence spending, and a rethinking of Nord Stream 2 arrangements in order to bring Russia back to the arms control table.

Jenny Oberholtzer provides a comparative analysis of NATO and Russia's force structures and defence postures. She highlights the fact that NATO concentrates its nuclear and nuclear-related capabilities in a few nations while Russia disperses them geographically. Oberholtzer demonstrates that in the event of a nuclear exchange, this might result in a decapitating strike against NATO's nuclear capabilities, thus leaving Russia in a position of relative strength, and allowing it to coerce its NATO adversaries. Oberholtzer's analysis is relevant as NATO continues to adapt its nuclear deterrence posture in light of Russian nuclear and missile advances that provide the ability to strike all of NATO Europe.

Finally, since 2010, one of the main changes observed in world politics is the rise of Big Tech and social media. Rhys Crilley conducts an analysis of social media and NATO nuclear deterrence. He looks at NATO's social media presence and the reactions it triggers when nuclear issues are discussed. Since 2010, NATO's social media presence has grown significantly as part of both its public diplomacy and strategic communication missions. NATO's adversaries, however, increasingly rely on social media to spread disinformation, while the information space has become more contested and complex. Crilley's analysis informs the growing body of research assessing the challenges of our future information environment.

These four chapters represent a small sample of those presented in 2020 at the NDC-sponsored Early-Career Nuclear Strategists Workshop. However, they highlight the growing importance of nuclear weapons in today's international politics, as well as the relevance of involving early-career researchers in policy debates. Although nuclear deterrence scholarship is often viewed as a relic of the Cold War, these inventive scholars stress the importance of involving, promoting and mentoring early-career work, to give the next generation the opportunity to contribute practically and intellectually to international security.

The shaky grounds of Russia’s “escalate to de-escalate doctrine”

*Nicolò Fasola**

Russia’s policy of nuclear weapons use has changed considerably over time. With the end of the Cold War, Moscow dropped the Soviet assessment of nuclear weapons deployment – essential to exert deterrence but scarcely useful for combat purposes. Russia hence decided to increase its reliance on nuclear weapons and threatened the pre-emptive use of strategic and tactical warheads in the face of large-scale conventional aggression against Russian territory.¹ Only the progressive improvement of Russia’s conventional forces has again reduced the doctrinal role of nuclear weapons.² By the end of Medvedev’s presidency in 2012, the use of *strategic* nuclear weapons was encapsulated in two textbook cases: retaliation (second strike), and last resort in response to existential threats.³ However, less clear is Russia’s position today regarding the employment of *non-strategic* nuclear weapons. Such uncertainty has sparked a lively debate around the so-called “Escalate to De-escalate Doctrine” (EDD), which describes Russia’s alleged intention to escalate a given conflict to nuclear level by using tactical warheads, with the aim of deterring the adversary from further action and exiting the war on favourable terms. No scholarly consensus exists in the West on this issue yet.

In this chapter, I argue that contemporary Russian military thought does not

* I am grateful to Jessica Cox, Andrea Gilli, Bruno Tertrais, and Kristin Ven Bruusgaard for their feedback on the first draft of this article, presented at the NATO Defense College 2020’s Early Career Nuclear Strategists Workshop. Thanks also to Derek Averre for his comments on a later draft.

1 J.W. Kipp, “Russia’s nonstrategic nuclear weapons”, *Military Review*, Vol.81, Iss.3, 2001.

2 K. Ven Bruusgaard, “Russian nuclear strategy and conventional inferiority”, *Journal of Strategic Studies*, Vol.44, No.1, 2020.

3 *Voennaia doktrina Rossijskoj Federatsii* (Doktrina), Kremlin website, 2010, paragraph 22, <http://kremlin.ru/supplement/461> (accessed 4 July 2021); *Voennaia doktrina Rossijskoj Federatsii* (Doktrina), *Rossiiskaia Gazeta*, 2014, paragraph 27, <https://rg.ru/2014/12/30/doktrina-dok.html> (accessed 4 July 2021); *Ob Osnovakh gosudarstvennoj politiki Rossijskoj Federatsii v oblasti iadernogo sderzhivaniia* (Osnovy), Kremlin website, 2020, <http://static.kremlin.ru/media/events/files/ru/1luTKhAiabLzOBjIfBSvu4q3bcl7AXd7.pdf> (accessed 4 July 2021).

accommodate the idea of early employment of nuclear munitions during wartime. Since the strategic consequences of nuclear use are uncertain, and the coercive potential of such weapons in wartime is deemed to be low, Moscow limits nuclear options to the terminal stages of a large-scale conflict, when survival is at risk. After reviewing the EDD debate, I present the main arguments and counter-arguments in support of, or against the existence of such a doctrine. Since proof of Moscow's reliance on EDD are weak, I propose to tackle the issue from a different perspective. Instead of focusing on the typical narrow set of sources, I look at the broader context of contemporary Russian military thought to ascertain whether the EDD is coherent with its main directions. Building on that, I reflect on Russia's possible warfighting use of (non-strategic) nuclear weapons and present some policy recommendations for NATO.

Tackling the debate around Russia's "escalate to de-escalate doctrine"

Definitions of what the EDD constitutes and implies are not unequivocal. However, a common thread is the expectation that Moscow, during or approaching wartime, would use disproportionate force within the theatre of operations, rapidly climbing the escalation ladder up to the nuclear level so as to shock the adversary and force it to end the hostilities.⁴ Those who believe in EDD's existence find its alleged confirmation in Russia's military doctrine, public statements, military exercises, and procurement patterns. Yet, as many experts argue, the EDD is built on shaky conceptual and empirical grounds.

The *doctrinal sources* proponents of the EDD typically refer back to the 1990s and early 2000s, and therefore lack relevance in the present context. During the first 10-15 years of existence, post-Soviet Russia had to compensate for the shortcomings of its conventional armed forces by considerably lowering the nuclear threshold. This doctrinal choice was rooted in Russia's ultimate inability to defend itself via conventional means. However, since 2008 the Russian armed forces have engaged in a comprehensive reform process that has significantly improved the structure, efficiency, and effectiveness of their conventional component.⁵ As a result, the need to over-emphasize the (deterrence and warfighting)

4 See for example: O. Olikar, *Russia's nuclear doctrine: what we know, what we don't, and what that means*, Washington, DC, Center for Strategic and International Studies (CSIS), May 2016, https://csis-prod.s3.amazonaws.com/s3fs-public/publication/160504_Olikar_RussiasNuclearDoctrine_Web.pdf (accessed 4 July 2021).

5 US Defense Intelligence Agency, *Russia military power: building a military to support great power aspirations*, Washington, DC, Defence Intelligence Agency, 2017, [https://www.dia.mil/Portals/27/Documents/News/Military Power Publications/Rus-](https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Russia%20Military%20Power%20Publications%20-%20Building%20a%20Military%20to%20Support%20Great%20Power%20Aspirations.pdf)

purposes of nuclear weapons no longer applies.⁶ Documents such as 2000's *Military Doctrine* or the over-cited 2003's Russian report on nuclear posture⁷ are hence not valid proof of Russia's alleged commitment to early nuclear strike *today*.

Proponents of the EDD also refer to *public statements* by Russian politicians, officers, and experts, who seem to outline Russia's propensity to use (non-strategic) nuclear weapons.⁸ These, too, constitute insufficient proof. Standard Russian signalling aims at intimidating and unnerving competitors via a skilfully arranged mixture of allusions and open threats, in order to set the tone of political dialogue and influence others' decision-making. This said, if considered in the broader context of Russian nuclear narratives, EDD statements are sparse, incoherent pronouncements mainly by people who are not responsible for wartime decision making and nuclear weapons use.⁹ As a whole, Russia's nuclear narratives do not focus on signalling readiness to first-use. Instead they focus on themes such as strategic instability, nuclear proliferation, and the West's non-compliance with arms control treaties – in response to which Russia, portraying itself as a virtuous nuclear state, reasserts its ability and willingness to react with nuclear or other means when and where necessary.¹⁰ Such discourses are linked with deterrence, survival, and retaliation (second-strike) – not with early nuclear use during war-time.

Military exercises do not decide the EDD issue either. Many Russian drills do have a nuclear component. In a 2014 blog-post for the *Bulletin of the Atomic Scientists*, Nikolai Sokov argued that all Russian drills have had staged (limited) nuclear strikes since the late 1990s.¹¹ Many EDD proponents build on this piece to corroborate their argument.¹² However, there are valid counter-arguments to such observations. Firstly, Sokov does not present the reader with precise references in support of his claims; some of his statements

sia Military Power Report 2017.pdf (accessed 4 July 2021).

6 Ven Bruusgaard, "Russian Nuclear Strategy".

7 E. Colby, "Russia's evolving nuclear doctrine and its implications", Note 01/2016, Paris, Fondation pour la Recherche Stratégique, 2016, <https://www.frstrategie.org/sites/default/files/documents/publications/notes/2016/201601.pdf> (accessed 4 July 2021); M.B. Schneider, "Russian nuclear 'de-escalation' of future war", *Comparative Strategy*, Vol.37, No.5, 2018, pp.361-372.

8 See for example: G. Persson, "Russian strategic deterrence – Beyond the brinkmanship?" *RUFs Briefing*, No.29, Swedish Research Defence Agency (FOI), 2015, <https://www.foi.se/rest-api/report/FOI%20Memo%205398> (accessed 4 July 2021).

9 B. Tertrais, "Russia's nuclear policy: worrying for the wrong reasons", *Survival*, Vol.60, No.2, 2018, pp.33-44; D. Adamsky, "Nuclear incoherence: deterrence theory and non-strategic nuclear weapons in Russia", *Journal of Strategic Studies*, Vol.37, No.1, 2014, pp.91-134.

10 J. DeRosa, "Mapping Russian nuclear narratives", *Journal of Slavic Military Studies*, Vol.30, No.4, 2017, pp.506-520.

11 N.N. Sokov, "Why Russia calls a limited nuclear strike 'de-escalation'", *Bulletin of the Atomic Scientists* (blog), 2014, <https://thebulletin.org/2014/03/why-russia-calls-a-limited-nuclear-strike-de-escalation/> (accessed 4 July 2021).

12 Colby, "Russia's evolving nuclear doctrine"; Schneider, "Russian nuclear 'de-escalation'"; S.J. Cimbala and R.N. McDermott, "Putin and the nuclear dimension to Russian strategy", *Journal of Slavic Military Studies*, Vol.29, No.4, 2016, pp.537, 542-543.

are therefore unsubstantiated. Secondly, drills taking place in the 1990s and early 2000s are not directly relevant to the understanding of today's Russian nuclear doctrine. Thirdly, while it is true that many Russian exercises have a nuclear component, they stage (large-scale) nuclear weapons use as result of escalation – not escalation in response to nuclear use, as the EDD idea of a limited nuclear strike early in a war would suggest.¹³ It is also worth noting that nuclear use in such exercises is often times inferred from the firing of nuclear capable missiles; however, as Bruno Tertrais underlines, nuclear *capable* does not mean nuclear *loaded*.¹⁴

This brings us to the last typical line of argument: *defence procurement*. Russia has inherited and built capabilities potentially enabling EDD, including an arsenal of about 1,900 non-strategic nuclear warheads.¹⁵ But their utility, albeit threatening, should not be overestimated. In fact, the vast Russian nuclear arsenal reveals serious operational shortcomings,¹⁶ nuclear procurement and modernization programmes lag behind schedule and funding, while conspicuous, is much less than other Russian forces'.¹⁷ These trends apply to the non-strategic stockpile, too, casting doubts on the Russian interest in this category of weapons.¹⁸ Moreover, the mere ownership or deployment of certain nuclear capabilities says nothing about Moscow's actual *willingness* to employ them early into a conflict, as the EDD prescribes. Alternative explanations see that as an attempt to exert political pressure on the West for the purpose of deterrence;¹⁹ or a system-mandated response to developments in US conventional and nuclear capabilities, in the context of the competition around ballistic missile defence systems.²⁰ Similar arguments also do not take into full consideration the specifics of the Russian defence complex, which is characterized by a certain degree of autonomy from the institutions setting military doctrine.²¹ For the sake of its own economic gains, the Russian military complex often times inflates the security concerns of policy-makers, so as to promote investments in expensive projects that may be of limited

13 Olikier, *Russia's nuclear doctrine*.

14 Tertrais, "Russia's nuclear policy", pp.39-40.

15 H.M. Kristensen and M. Korda, "Russian nuclear forces, 2020", *Bulletin of the Atomic Scientists*, Vol.76, No 2, 2020, pp.102-117.

16 B. Renz and R. Thornton, "Russian military modernization: cause, course, and consequences", *Problems of Post-Communism*, Vol.59, No.1, 2012, pp.44-54.

17 R. Connolly and C. Sendstad, "Russian rearmament", *Problems of post-Communism*, Vol.65, No.3, 2018, pp.143-160; J. Cooper, *Russia's state armament programme to 2020: a qualitative assessment of implementation 2011-2015*, Stockholm, Swedish Defence Research Agency (FOI), 2016.

18 Tertrais, "Russia's nuclear policy", p.36.

19 M. Fitzsimmons, "Russian Strategy and the End of the INF Treaty", *Survival*, Vol.60, No.6, 2019, pp.122-125.

20 A. Arbatov, "The vicissitudes of Russian missile defence", *Bulletin of the Atomic Scientists*, Vol.74, No.3, 2018, pp.227-237.

21 Adamsky, "Nuclear incoherence".

or no utility to military planners. As a result, military-industrial outputs may not fully reflect doctrinal requirements.

Overall, the EDD idea does not seem to be backed by solid evidence. The narrow arguments and *ad hoc* examples typically deployed in support of the existence of a Russian EDD either refer to a historical context whose conditions do not apply anymore, or disregard relevant features of the Russian political and strategic landscape. The EDD idea should not be accepted as an indisputable fact. Therefore, in order to find answers concerning Moscow's warfighting use of nuclear weapons, I suggest a different approach.

Broadening the analytical frame: Russia's military preferences and nuclear use

Instead of inferring the war-fighting role of nuclear weapons from pre-selected sources and events, I propose to look at the broader context of Russia's military debate and check whether EDD is coherent with that framework, or is rejected by the Russian mindset. Based on the analysis of articles published in the leading Russian military journal (*Voennaia Mysl'*) during 2013-2018 and the wider professional debate, I identify two pillars of Russia's approach to warfighting: asymmetry and pro-activeness.²² In the following paragraphs, I expand on their meaning and then discuss their implications for nuclear use.

The Russian preference for the asymmetric and pro-active use of force

The first pillar of Russia's military doctrine is *asymmetry*.²³ This concept should not be interpreted as signalling a focus on non-military measures of confrontation.²⁴ In the contemporary Russian doctrine, asymmetry acquires the following characteristics.

22 I employ the term "asymmetric" with its basic meaning of "non-matching" at quantitative and/or qualitative level. In military terms, this means that if the one side of a conflict uses a type A of force, then the asymmetric opponent will either use the same type of measures, yet stepping up or scaling down its quantitative commitment; or it will use a type B of force. If type A has a conventional character, then type B may well be irregular – but it may also involve simply other kinds of conventional measures. The choice will depend as on the capabilities of the parties, as on their military proclivities.

23 K. Pynnöniemi, "Russia's national security strategy: analysis of conceptual evolution", *Journal of Slavic Military Studies*, Vol.31, No.2, 2018, pp.240-256; R. Thornton, "The Russian military's new 'main emphasis': asymmetric warfare", *RUSI Journal*, Vol.162, No.4, 2017, pp.18-28.

24 V.V. Babich, "K opredeleniiu form voennykh (boevykh) deistvii - cherez obnovlennoe raskrytie ikh sushchnosti i soderzhaniia", *Voennaia Mysl'*, No.5, 2014, pp.42-53; V.V. Diatlov, "Problemye aspekty voennoj konfliktologii. Rol' raketnykh voisk i artillerii v voennykh konfliktakh", *Voennaia Mysl'*, No.8, 2013, pp.43-49; S.V. Fomov, "Pragmaticheskij podkhod k ponimaniu vojny i sposobov ee predotvrashcheniia", *Voennaia Mysl'*, No.4, 2013, pp.47-53; N.M. Vasil'ev, "O krizise voennoj nauki i putiakh vykhoda iz nego", *Voennaia Mysl'*, No.3, 2013, pp.38-46.

Firstly, it is centred on conventional land power. Moscow has attempted repeatedly to develop a balanced military structure, but doctrinal emphasis has remained on ground forces – irrespective of technological and strategic conditions.²⁵ The enduring emphasis on the land domain is influenced by the legacy of Soviet thinking and Russia's geographical (geopolitical) conditions, both of which point to the idea that the physical control of land is a priority. Therefore, infantry is key to win wars. Given the country's relatively poor economic base and logistical depth, it would be difficult for Moscow to sustain large-scale war efforts with exclusively national resources, or on national territory only. The ability therefore to seize and hold enemy land becomes crucial to the success of Russian war efforts – with ground forces being the main enabler. The high social status of Army officers in the Russian security elite – comparatively higher than that of the Navy and Air-space Force – is both cause and consequence of such thinking. Of course, this does not mean that other services and arms will not be cultivated. What it does mean is that land will be the major domain of Russia's war-fighting.

Secondly, asymmetry is pursued in both quantitative and qualitative terms. The contemporary Russian military debate shows a clear preference for a quantitatively asymmetric approach. Emphasis is put on the concentration of forces and numerical superiority – with troop mobility as the means to achieve that. This links Triandiflov's theory of deep offensive operations to the later theory of strategic offensive and Russian operational art today.²⁶ They all point to the simultaneous attack of the adversary along the entire depth of its defence, via a series of strikes originating from converging directions. The success of these manoeuvres is guaranteed by the massing of troops at one or several points. The qualitative side of Russia's asymmetric doctrine finds expression, *inter alia*, in the preference for the joint use of (military) instruments and resources to stage cross-domain operations.²⁷ This means that, irrespective of the nature of the specific conflict, the whole of Russia's resources would be deployed in support of the war effort.²⁸ The text of *Military Doctrines* confirms such practice, suggesting that the defence of Russia is dependent on the coordination and integration of civilian and military spheres, in a way that is coherent with

25 J. Norberg and M. Goliath, "The fighting power of Russia's Armed Forces in 2019", in F. Westerlund and S. Oxenstierna (ed.), *Russian Military Capability in a Ten-Year Perspective – 2019*, Stockholm, Swedish Defence Research Agency (FOI), 2019, p.60; I.N. Vorob'ev and V.A. Kiselev, "Otechestvennaia voennaia teoriia: istoriia i sovremennost'", *Voennaia Mysl'*, No.8, 2013, pp.28-42. See also Batyushkin, quoted in: C.K. Bartles, "Preparation and Conduct of Military Actions in Local Wars and Armed Conflicts", *Russian Studies Series* No.03/18, NATO Defense College, Rome, 2018, <http://www.ndc.nato.int/download/downloads.php?icode=564> (last accessed 4 July 2021).

26 Vorob'ev and Kiselev, "Otechestvennaia voennaia teoriia".

27 S.G. Chekinov and S.A. Bogdanov, "Voennaia strategiia: vzgliad v budushchee", *Voennaia Mysl'*, No.11, 2016, pp.3-15.

28 S.R. Covington, *The culture of strategic thought behind Russia's modern approaches to warfare*, Cambridge, Harvard Kennedy School Belfer Center, 2016, pp.26-35, <http://www.belfercenter.org/publication/culture-strategic-thought-behind-russias-modern-approaches-warfare> (accessed 4 July 2021).

a holistic (multi-level, interconnected) interpretation of security.²⁹ Moscow aims at hitting the adversary at multiple levels, on multiple fronts, with multiple means.

Russian military thought also shows a peculiar proclivity towards *pro-activeness*. Emphasizing the value of seizing the initiative, Moscow does not approach conflict reactively but pre-emptively, by trying to anticipate the adversary's moves.³⁰ Russian military writings underline the importance attached to the initial period of war, which the military and political outcomes of the conflict are dependent on.³¹ Seizing the initiative appears as a vital objective, and we should expect Russia to concentrate its efforts and resources in the initial phase of an armed conflict, in order to secure military dominance and achieve victory.

Several features of Russia's defence policy can be brought back to these assumptions, including the emphasis on command and control (C2) and deterrence. The theme of C2 develops mainly around the objective of command superiority, that is "a clear advantage in the efficiency of response to critical changes in the [military-strategic] situation".³² The most important set of tasks serving this objective consists of the pre-determination, misdirection, and disorganisation of the adversary's C2 system.³³ This can be achieved by targeting the adversary's chain of command with either reflexive control techniques³⁴ or disruptive measures.³⁵ By doing so, Russia would gain an advantage in the elaboration and implementation of strategic decisions, thereby securing a firm grasp on the pace and intensity of the confrontation (escalation dominance).³⁶

29 Doktrina (2014), paragraphs 19-34, 40-42.

30 This statement regards Russia's expected war-time behaviour. I am *not* arguing that Russia will initiate war just to benefit from the advantages of the initiative – not necessarily at least. What I argue instead is that, if a conflict breaks out, then Russia will search for pro-activeness.

31 S.G. Chekinov and S.A. Bogdanov, "O kharaktere i soderzhanii vojny novogo pokoleniia", *Voennaia Mysl'*, No.10, 2013, p.23; idem, "Prognozirovaniie kharaktera i soderzhaniiia vojn budushhego: problemy i suzhdeniia", *Voennaia Mysl'*, No.10, 2015, p.46; I.L. Kardash, "O sovershenstvovaniiu sistemy territorial'noy oborony", *Voennaia Mysl'*, No.2, 2014, pp.3-10.

32 A.V. Nagalin *et al.*, "Neposredstvennoe upravlenie boevym deistviiami i otsenka ego effektivnosti", *Voennaya Mysl'*, No.7, 2015, p.26; see also B.A. Balybin, "Zavoevanie prevoskhodstva nad protivnikom v upravlenii primenitel'no k operatsii (boiu)", *Voennaia Mysl'*, No.3, 2016, pp.3-8.

33 I.E. Donskov *et al.*, "K voprosu o dezorganizatsii upravleniia voyskami (silami) i oruzhiem", *Voennaia Mysl'*, No.8, 2017, pp.19-25; A.N. Kliushin *et al.*, "O polozheniakh teorii dezorganizatsii upravleniia voyskami (silami)", *Voennaya Mysl'*, No.9, 2017, pp.65-69.

34 V.L. Makhnin, "Refleksivnye protsessy v voennom iskusstve: istoriko-gnoseologicheskii aspekt", *Voennaya Mysl'*, No.2, 2013, pp.31-44; V.I. Orlanskii and N.F. Kuznetsov, "O problemakh organizatsii operativnoy maskirovki", *Voennaia Mysl'*, No.1, 2013, pp.17-23; V.G. Kazakov *et al.*, "Sposob kompleksnogo upravleniia boevymi deistviiami", *Voennaia Mysl'*, No.5, 2014, pp.54-60.

35 Balybin, "Zavoevanie prevoskhodstva"; S.I. Pasichnik, "K voprosu o kompleksnom porazhenii protivnika i sposobakh ego osushchestvleniia pri dezorganizatsii upravleniia", *Voennaia Mysl'*, No.6, 2017, pp.38-42.

36 I.E. Donskov *et al.*, "Prevoskhodstvo v upravlenii - obiazatel'nyi faktor realizatsii osnovnykh zakonomernostei operativnogo iskusstva", *Voennaia Mysl'*, No.11, 2017, pp.28-31; I.E. Donskov *et al.*, "Zavoevanie prevoskhodstva v upravlenii kak tsel' primeneniia voisk radioelektronnoy borb'by v operatsiakh ob'edineniia Sukhoputnykh voisk", *Voennaia Mysl'*, No.1,

A similar reasoning emerges from the Russian debate on deterrence.³⁷ Moscow defines (strategic) deterrence quite broadly, bringing together military and non-military measures with the aim of “persuading the military-political leadership and the public of the state (coalition of states) of the potential adversary (aggressor) on the uselessness of aiming to achieve military and political aims by force”.³⁸ This implies problems of identifying the right path of persuasion or, in purely military terms, the unacceptable level of damage that would deter the enemy from action.³⁹ Yet, irrespective of the specific set of measures to be deployed, Russian military professionals stress the need to implement deterrence pro-actively, influencing the strategic planning of potential adversaries even before the use of force emerges among their options. In this sense, deterrence becomes a form of reflexive policy, oriented towards controlling the time factor, in support of the achievement of command superiority and escalation dominance.

Overall, the Russian military prefers an asymmetric and pro-active use of force. Asymmetry develops at both quantitative and qualitative levels and mainly within the conventional domain; although other types of non-military means may play a supportive role. Together with the emphasis on seizing the initiative, this brings about a cross-domain approach based on the massing of forces, high mobility, and preemption – the latter to be achieved via the constant pursuit of command superiority and deterrence.

Implications for nuclear use

In general terms, an asymmetric, pro-active military doctrine may accommodate the idea of nuclear first use for de-escalatory purposes. Belligerents who embrace such a doctrine could see nuclear power as a quick and effective way to wipe out the adversary’s military and its will to fight with disproportionate force, early in a conflict. This may seem to be the case of Russia. However, given the specific intellectual tradition within which contemporary

2018, pp.28-32.

37 To expand on Russia’s approach to deterrence, see: S. Charap, “Strategic *Sderzhivanie*. Understanding Contemporary Russian Approaches to ‘Deterrence’”, *Security Insights*, No.62, George C. Marshall European Center for Security Studies, 2020, <https://www.marshallcenter.org/en/publications/security-insights/strategic-sderzhivanie-understanding-contemporary-russian-approaches-deterrence-0> (accessed 4 July 2021); K. Ven Bruusgaard, “Russian Strategic Deterrence”, *Survival*, Vol.58, No.4, 2016, pp.7-26.

38 V.I. Polegaev and V.V. Alferov, “O neiadernom sderzhivanii, ego roli i meste v sisteme strategicheskogo sderzhivaniia”, *Voennaia Mysl'*, No.7, 2015, pp.4-5; see also A.L. Khriapin *et al.*, “Strategicheskoe sderzhivanie v usloviakh sozdaniia SSHA global'noj sistemy PRO i sredstv global'nogo udara”, *Voennaia Mysl'*, No.1, 2015, pp.18-22; I.A. Vartan'ian *et al.*, “Sistema kontroliia kosmicheskogo prostranstva kak element strategicheskogo sderzhivaniia”, *Voennaia Mysl'*, No.9, 2015, pp.29-35.

39 O.I. Aksenov *et al.*, “Strategicheskie oboronitel'nye sistemy kak faktor sderzhivaniia vooruzhennoj agressii”, *Voennaia Mysl'*, No.6, 2015, pp.15-21; Polegaev & Alferov, “O neiadernom sderzhivanii”.

Russian military thought develops, and the specific doctrinal meaning given to asymmetry and pro-activeness, I argue that this is not the case: EDD-type nuclear use does not fit into the Russian military mindset.

First, as observed above, Russia builds asymmetry within the conventional (land) domain; other types of force come further down the hierarchy of warfighting preferences. This means that, as a background condition, the Russian military does not present any peculiar preferences for the nuclear domain – in contrast to what one would expect if Moscow's nuclear doctrine were to contemplate an early-first-strike. Furthermore, the Russian quest for asymmetry in terms of quantitative and qualitative advantages does not sit well with the over-reliance on one particular arms system EDD entails. Moscow has, in fact, rejected the existence of an "absolute weapon" since early Soviet times, setting the requirement for military victory in adaptable combined arms operations aimed at destroying enemy forces *and* seizing territory. This view appears out of step with the one-size-fits-all, nuclear-centred nature of the EDD.

Second and relatedly, early use of non-strategic nuclear warheads would impair Russia's ability to move troops forward and exploit contested territories. Instead of facilitating the termination of warfighting, that would run counter to Moscow's consolidated military-diplomatic *modus operandi* as seen in Ukraine and Syria, where control of conflict dynamics on the ground provided the Kremlin with powerful political leverage. Radiation would leave entire areas inaccessible not only to the adversary but also to Russia, thereby preventing the kind of operations for which its military has been trained. The modernization and numerical increase of Russian CBRN troops should not be interpreted narrowly as indicative of a greater ability (willingness) to operate in post-nuclear war-zones. In fact, such reforms point to the transformation of CBRN units into elite assault troops for in-depth ground manoeuvres, as well as defence against improvised chemical devices and precision strikes – rather than the conduct of nuclear-friendly operations.⁴⁰

Third, Russia's pro-active approach to military conflict is not synonymous with recklessness. The Russian security elite understands that holding the initiative is a necessary but not sufficient condition for obtaining military victory. On the one hand, the achievement of strategic surprise increases the near-term chances of victory by allowing Russia to set the initial parameters of conflict. On the other hand, a successful *blitz* is not worth the risk of raising the chances of defeat over the longer term. This assessment makes EDD-type nuclear use unpromising in Russian eyes. The early employment of nuclear warheads would

40 A. Ramm, *The Russian army: organization and modernization*, Arlington, Center for Naval Analysis (CNA), 2019, p.15, https://www.cna.org/CNA_files/PDF/IOP-2019-U-021801-Final.pdf (accessed 4 July 2021); I. Sutyagin and J. Bronk, *Russia's new ground forces: capabilities, limitations and implications for international security*, Abingdon, Routledge, 2017, pp.62-69.

bring the level of hostilities suddenly very close to Armageddon – the one scenario that Russia truly plans to avoid – without providing any actual guarantees of success. In other words, early nuclear strikes run counter to Russia's goal of escalation dominance, since they increase the risk and cost of defeat without providing Moscow with any additional, solid guarantee of exiting the conflict as the winning party.

Fourth, one could argue that Russia may still gain from making the West believe that EDD is the likely course of events. In that sense, EDD would be an attempt at reflexive control for deterrent purposes. However, the advantages of such hypothetical messaging strategy are all but clear. To declare a doctrine that is not backed by actual intentions entails huge credibility costs. Also, so far the West has responded to the potential threat of the EDD with higher levels of military readiness and a more aggressive nuclear posture⁴¹ – the opposite of being deterred. The overall result has been the further destabilization of an already fragile strategic landscape. Hence, even if we were to see the EDD as a Russian attempt at reflexive control, then it must be assessed as a failure. In that case, one would expect Russia to clarify its nuclear posture; has it done so? As noted earlier, Russian official documents do not make any explicit reference to the EDD, yet analysts and policy-makers see all sorts of hints behind those texts. In today's international political climate, any clarifications would be of limited use, in as much as others' intentions seem to be always interpreted negatively. This would make it difficult for Russia to escape the failure of its own nuclear reflexive control.

Fifth, the fact that nuclear capabilities contribute to Russia's deterrence does not contradict previous statements. Nuclear weapons can be used as means to guarantee ultimate survival, prevent war or create favourable conditions to wage it⁴² – but this says nothing about intended nuclear use *during* wartime. The Georgia and Ukraine conflicts demonstrate Russia's ability to exploit the nuclear umbrella to carry out military intervention by other preferred and conventional means. Nuclear tools contributed to preventing direct military involvement of the West and keeping the conflict limited, but they played no role during the active phase of conflict. Similarly, nuclear options also were absent from the Syria campaign, where Russia's kinetic operations reached a much higher intensity. Even when considered within the frame of deterrence, the nuclear dimension plays a lesser role than other military means like land-based conventional missiles, as well as electronic and information warfare techniques.⁴³ These can be employed pro-actively without risking the

41 US Department of Defense, *Nuclear Posture Review*, US DoD website, 2018, <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF> (accessed 4 July 2021).

42 Doktrina (2014), paragraph 27; Osnovy (2020), paragraph 17.

43 See for example: A.A. Kokoshin, "Strategic nuclear and nonnuclear deterrence: modern priorities", *Herald of the Russian Academy of Sciences*, Vol.84, No.2, 2014, pp.59-68; Polegaev & Alferov, "O neiadernom sderzhivani".

outbreak of a nuclear exchange – thereby preserving escalation dominance.

Sixth, and relatedly, the Russian expert debate generally conveys a certain scepticism about the emergence of nuclear conflict, at least over the mid-term.⁴⁴ International normative constraints, the dissuasive potential of Russian and US missile defences (among others), as well as the lack of “basic logistic capabilities for the deployment of conventional troops following an exchange of nuclear strikes”⁴⁵ make nuclear conflict an unlikely event. To be fair, Russian commentators do not exclude this possibility completely, blaming Washington’s willingness to climb up the escalation ladder to fulfil its political purposes.⁴⁶ But irrespective of the value judgement on the US, the overall assessment implies that Russia is not keen on initiating nuclear conflict, deeming that it would not be useful to achieve one’s goal in present conditions.

In conclusion, the discussion above strongly suggests that the nuclear option is not a priority for Russia in the event of war. Quite the contrary, there is a certain reluctance towards nuclear weapons use – which is not easily accommodated within contemporary Russian military thinking and is perceived to be at odds with today’s military-strategic conditions. This is not to say that Moscow has no plans in case of the need to use its nuclear weapons. However, such plans are not likely to have anything in common with the aggressive, early use of (non-strategic) nuclear weapons postulated by the EDD. In an excellent trilogy for the Center for Naval Analysis (CNA), Kofman, Fink, and Edmonds explore in detail Russian ideas about escalation dominance before and during conflict.⁴⁷ Among other findings, their study shows that, firstly, nuclear use would be part of a strategy of cost imposition rather than denial of benefits; secondly, it would likely target military installations and troops, not civilian facilities; thirdly, and most importantly, Russia may resort to the nuclear option for demonstrative purposes in conflicts from the regional scale upwards, but actual warfighting use would be contemplated only in the latest stages

44 A.A. Kokoshin, “Strategic stability: scientific-technological, military, and political aspects”, *Herald of the Russian Academy of Sciences*, Vol.85, No.6, 2015, pp.467-473; V.V. Kruglov and V.I. Iakupov, “O metodologii prognozirovaniia vooruzhennoj bor’by”, *Voennaya Mysl’*, No.4, 2017, pp.5-13; S.R. Tsyrendorzhiev and B.V. Kuroedov, “Perspektivy razvitiia sistemy mezh-dunarodnykh otnoshenij i uslovij obespecheniia voennoj bezopasnosti Rossijskoj Federatsii”, *Voennaia Mysl’*, No.6, 2017, pp.5-18.

45 A.D. Chekov *et al.*, “War of the future: a view from Russia”, *Survival*, Vol.61, No.6, 2019, p.32.

46 See for example: Chekov *et al.*, “War of the future”; Kokoshin, “Strategic stability”. The accusation is clearly reciprocated by the US.

47 A.L. Fink and M. Kofman, *Russian strategy for escalation management: key debates and players in military thought*, Arlington, Center for Naval Analysis (CNA), 2020, https://www.cna.org/CNA_files/PDF/DIM-2020-U-026101-Final.pdf (accessed 4 July 2021); M. Kofman and A.L. Fink, “Escalation management and nuclear employment in Russian military strategy”, *War on the Rocks*, 2020, <https://warontherocks.com/2020/06/escalation-management-and-nuclear-employment-in-russian-military-strategy/> (accessed 4 July 2021); M. Kofman *et al.*, *Russian Strategy for Escalation Management: Evolution of Key Concepts*, Arlington, Center for Naval Analysis (CNA), 2020, https://www.cna.org/CNA_files/PDF/DRM-2019-U-022455-1Rev.pdf (accessed 4 July 2021).

of a large-scale war.⁴⁸ The three authors find no trace of reckless optimism about nuclear coercion. Quite the opposite, Russians show very low confidence in the credibility of early intra-war nuclear use – including for EDD-type purposes.

Conclusion

This paper has explored Russia's preferences in the nuclear domain, thereby contributing to the debate over the so-called EDD. After having reviewed the main arguments and counter-arguments relative to the EDD's existence, I assessed the coherence of this hypothetical doctrine alongside the main tenets of contemporary Russian military thought. I concluded that the latter does not accommodate early use of (non-strategic) nuclear weapons for de-escalation during warfighting. While Moscow considers nuclear weapons for the purposes of deterrence, their warfighting utility is deemed to be low. Therefore, nuclear use is envisaged only in the terminal phases of a large-scale conflict.

Western policy-makers and military planners should certainly take into consideration the whole range of possible scenarios, especially the most worrying ones. However, they should also refrain from making up or over-inflating threats. At the very least, this means avoiding projecting our own strategic assumptions onto others.⁴⁹ As Jacob W. Kipp wrote when discussing other Russia-related issues, “[a]sking ‘blue’ questions of ‘red’ materials has a tendency to result in false assumptions about an opponent’s decision-making”, which generates, in turn, serious security risks.⁵⁰ The fact that the US has long included in its doctrine the possibility of carrying out limited nuclear strikes does not imply that Russia does so as well.⁵¹ If the West re-shapes its posture on the basis of a non-existent Russian EDD, possible outcomes range from absolute nuclear catastrophe to heightened tensions with Moscow. Moreover, we would be left with fewer resources to prepare for what we actually know to be Russia's likely *modus operandi* in case of war – i.e., conventional cross-domain operations heavily reliant on ground forces, manoeuvred pro-actively to achieve

48 Russian military writings present a three-level classification of war, ranging from local war (*lokal'naiia vojna*) to regional war (*regional'naiia vojna*) to large scale war (*krupnomashtabnaia vojna*). Local wars typically involve two or more states and narrow military-political goals that affect the interests of warring parties only; conflict unravels exclusively within the borders of such states. Regional wars have greater geographical and political scope: they see the participation of two or more states or coalitions in the pursuit of “important” military-political goals, and involve an entire region. Finally, large scale wars have a total character: they stage the clash between coalitions of states led by great powers, which struggle to achieve “radical” military-political goals; large scale wars affect multiple regions.

49 K. Booth, *Strategy and ethnocentrism*, London, Croom Helm, 1979.

50 J.W. Kipp, “‘Smart’ defence from new threats: future war from a Russian perspective: back to the future after the war on terror”, *Journal of Slavic Military Studies*, Vol.27, No.1, 2014, p.39.

51 Ven Bruusgaard, “Russian Nuclear Strategy”, p.3.

asymmetric advantages.

I ultimately agree with Anichkina, Péczeli, and Roth that “debate in the West about the very existence of this concept [EDD] is evidence of the need for scholars to better understand the current directions of Russian strategic thinking”.⁵² Further research should aim at a more thoroughgoing assessment of original source material, striving to understand Russian military thought on its own terms. In order to be successful in this endeavour, the West should nurture a new generation of area experts with linguistic skills and more than a cursory knowledge of Russia’s history, politics, and society.

52 T. Anichkina *et al.*, “The future of US–Russian nuclear deterrence and arms control”, *Bulletin of the Atomic Scientists*, Vol.73, No.4, 2017, p.272.

Glass-jawed Europe: the vulnerability of NATO's conventional posture in nuclear conflict

Jenny Oberholtzer

There are two types of boxers: glass-jawed and those with an iron jaw. The latter shake off repeated punches to the skull, staying upright, and fighting longer. The former, in contrast, are massively vulnerable to knock-out punches – no matter the reach and strength of their own punch. Despite its superior conventional firepower, NATO is closer to a glass-jawed boxer than an iron-jawed one: its lack of defensive posture makes it a powerful fighter yet unable to keep punching after suffering a single, major hit.

This chapter describes a fictional scenario: a NATO-Russian military confrontation. The simulation is based on publicly accessible information (and educated guesses) for NATO and Russian nuclear postures, NATO air basing, Russian maneuver doctrine and jet fighters. For strike estimates, the chapter uses Alex Wellerstein's NukeMap tool.¹ The paper finds that limited nuclear strikes from the Russian Federation could completely cripple many NATO members' military forces, with limited impact on civilian structures, and easily render inaccessible NATO Allies' nuclear weapons made available for "nuclear sharing". In contrast, the Russian Federation's more dispersed posture, for both nuclear and conventional capabilities, renders any individual nuclear strike on Russian territory unlikely to have the desired effect. In sum, adding more weapons to NATO's inventory in Europe will not change the existing inherent imbalance: NATO does not suffer from a problem of inventory but rather one of posture.

Possible operational use of nuclear weapons in Europe

This paper assumes that a (highly unlikely) conflict between Russian and NATO member militaries occurs as a result of an (even more unlikely) all-out invasion of a NATO member

¹ Wellerstein's tool is available to the public at <https://nuclearsecrecy.com/nukemap/>

state. The fictional scenario includes an (extremely unlikely) land-bridge between Belarus (using Russian forces, with a “neutral” Belarus) and Kaliningrad.² In this example of conflict, NATO forces are few and concentrated, while Russian forces are considerable and dispersed. NATO forces in the region are so small that they tend to be measured in battalions, rather than brigades. The local units are tenacious, with a history that outstrips what one might expect given their size, but they tend to be infantry rather than armoured units. In this scenario, we can generously include the NATO Enhanced Forward Presence into the equation, as well as the possibility of representatives from the Very High Readiness Joint Task Force (VJTF), and rapidly deployable airborne units such as the American 82nd Division and 173rd Brigade, the British Paras and the French 11th Parachute Brigade. For the sake of the argument, we could assume the presence of at least two additional brigades, with the understanding that even the VJTF would require a few weeks to fully mobilize. Naval capabilities would be unlikely to come into play in the Baltic Sea, given the number of guns, missiles and eyes that would follow any attempted maneuver.³ NATO's real strength in this scenario would be its air capabilities, and the United States alone can be expected to flow about a squadron a day into the theatre.⁴

These ground and air units would be facing a large land army with strong air defences. One think tank report suggests a potential invasion force of some 16 mobile battalions, with an additional ten battalions of artillery, as well as a large amount of organic air defence.⁵ In order to respond conventionally, NATO would need to be able to field aircraft equipped to deal with air defences. Losing those aircraft would render NATO's easiest counterpunch effectively useless, and require a much longer build-up of conventional capability to respond.

In order to avoid escalation, Russia might choose to cripple NATO military capability in the European theatre, rendering it incapable of response. If this is done in a minimally destructive way, it is conceivable that there would be no appetite for escalating to nuclear use, or for committing NATO member forces to the theatre (basically those forces currently in the United States, Canada, and overseas territories or other activities). Additionally, the

2 According to recently released Russian statements on the use of nuclear weapons, “escalate to de-escalate” is not something currently openly encouraged. Rather, nuclear weapons are meant to deter a conventional fight in the first place, or to end the possibility of further escalation. See “Об Основах государственной политики Российской Федерации в области ядерного сдерживания”, Pub. L. No.355 (2020), <http://publication.pravo.gov.ru/Document/View/0001202006020040?index=0&rangeSize=1>

3 A. Metrick *et al.*, “Contested seas: maritime domain awareness in Northern Europe: a report of the CSIS International Security Program”, 2018.

4 While this may have changed somewhat since the first Gulf War, USAF reports at the time noted an average rate of one squadron a day. AF/CVAX, “Air Force performance in Desert Storm”, Washington, DC, AF/CVAX, 1991.

5 D. A. Shlapak and M. Johnson, “Reinforcing deterrence on NATO's Eastern Flank: wargaming the defense of the Baltics”, RAND, Santa Monica, California, 2016, https://www.rand.org/pubs/research_reports/RR1253.html

mere attempt to move those conventional forces to the European theatre would be so slow as to render any conventional attack pointless. Russian forces would likely already have accomplished any potential political objectives, and could negotiate from a position of strength before US or Canadian troops had even been loaded onto transport ships to join their NATO allies in battle.

To make these scenarios more concrete, this paper uses open-source locations of nuclear weapons in both Russia and on NATO territory, as well as considers the impact of nuclear strikes on the most important elements of conventional capabilities on both sides. As described above, NATO's immediate strength lies in conventional 5th generation air power, while Russian strength comes from its ground forces. For simplicity's sake, all proposed nuclear strikes are a standardized 20-kilotons, with blasts optimized for between 5 and 200 pound-force per square inch (PSI), depending on the target selected, using recommendations from Samuel Glasstone's *Effects of Nuclear Weapons*. Five PSI is preferred for maximizing damage to aircraft and aircraft personnel, while 200 PSI is preferred for strikes against hardened nuclear storage facilities.⁶ All nuclear strikes are estimated using Alex Wellerstein's NukeMap tool.

Counter-force attacks

The particularly effective outcome of a Red (i.e. non-NATO) counter-force attack on Blue (i.e. NATO) nuclear forces in the European theatre relates to the enormous difference in posture. Counter-force attacks are nuclear strikes on an adversary's nuclear capabilities. Just a handful of nuclear weapons, targeted effectively in a counter-force attack, could render NATO's nuclear weapons storage sites worthless, with very few casualties, and without Russian nuclear weapons targeting specifically American, French or British nuclear storage sites on their home turf. This imbalance would allow the leadership of those nuclear-armed states to determine, in case of attack, whether or not to release nuclear weapons. Those leaders may determine that the risks outweigh the benefits. Consider this: with the exception of the Incirlik air base near the city of Adana, in Southern Turkey, as well as British and French nuclear sites, each individual NATO nuclear storage facility is understood to likely contain ten weapons or more, each containing a high proportion of the small NATO stockpile in Europe. Moreover, these weapons generally require loading onto an aircraft or ship which may or may not be available at any given time. Conversely, individual Russian sites may contain only nine warheads, a much lower percentage of the Russian stockpile, ready to load onto Transport Erector Launchers (TELs) and be launched

⁶ S. Glasstone, *The effects of nuclear weapons*, 3rd ed., Washington, DC, Department of Defense and Department of Energy, 1977, p.194.

almost immediately.⁷

Open-source information gives the limited number of Allies' nuclear storage sites in Europe: Belgium, Germany, Italy, The Netherlands and Turkey for NATO's nuclear sharing sites, in addition to those in France and the UK.⁸

Consider a counter-force strike on Aviano, the Italian Air Force military base near the North-Eastern city of Pordenone, also used by the United States. Such a strike would be the most immediately effective attack against Blue nuclear capabilities in the NATO theatre (if we ignore French and British stockpiles). A single 20-kiloton weapon on this base, set to surface burst, could fairly easily cover the nuclear storage sites with close to 200 pound-force per square inch (PSI), which is more than enough to collapse and bury the shelters, rendering the nuclear weapons either unreachable or unusable. Such a strike would be remarkably moderate in terms of casualties, despite the immediate proximity of a large civilian population. According to NukeMap estimates, just over 700 people would die immediately, with an additional 1,500 casualties.

Kleine Brogel, the Belgian air base in the Eastern part of the country, is home to both fifth generation aircraft and an estimated twenty nuclear B-61 warheads. It could suffer a more severe fate. Estimated casualties in a two-warhead attack over this site come to under 800 immediate fatalities and an additional 3,000+ injuries. However, in this case too, an attack could wipe out all the airfield's maintenance capability (at 5 PSI or higher) as well as likely crushing the bunker in which the nuclear warheads are stored (at 200 PSI or higher). At the very least, it would make accessing those weapons difficult for some time.

NATO attacks on Russian nuclear forces would have considerably less impact than a similar strike on a NATO facility. While NATO has fewer than a dozen facilities with around 20 weapons per site, Russia has over 70 nuclear facilities, each presumably with fewer than 10 nuclear weapons.⁹ In other words, increasing the number of weapons in the NATO sites in Europe will not reduce the overall vulnerability to a counter-force attack.

Red counter-military options

NATO conventional forces face similar threats from counter-military attacks. While a counter-force strike focuses on an adversary's nuclear capability, a counter-military attack

7 H. M. Kristensen and M. Korda, "Russian nuclear forces, 2019", *Bulletin of the Atomic Scientists* 75, No.2, March 4, 2019, pp.73-84, <https://doi.org/10.1080/00963402.2019.1580891>; H. M. Kristensen, "Urgent: move US nuclear weapons out of Turkey", *Federation of American Scientists* (blog), 2019, <https://fas.org/blogs/security/2019/10/nukes-out-of-turkey/>

8 H. M. Kristensen and M. Korda, "United States nuclear forces, 2020", *Bulletin of the Atomic Scientists* 76, No.1, 2 January 2020, pp.46-60, <https://doi.org/10.1080/00963402.2019.1701286>.

9 Kristensen and Korda, "Russian nuclear forces, 2019".

targets overall military capability instead. When we start to account for conventional capabilities in the region, NATO's basing limitations become apparent. There are several air forces in NATO that are currently investing in fifth generation fighter aircraft. The vast majority of these aircraft (primarily F-35 *Lightning II Joint Strike Fighter*) are owned and operated by the US Air Force, and to a lesser extent, the US Navy and the US Marine Corps. Others are going to be owned and operated (and in some cases already are) by the Italian, Dutch, Danish, Norwegian and U.K. air forces. Fifth generation fighters are particularly important in a theoretical fight with the Russian military because of their stealth capability, rendering them less vulnerable to adversary integrated air defence systems.¹⁰ While a third or fourth generation ground attack aircraft could, in theory, penetrate the air defence bubble of the Russian Federation far enough to release missiles and return to base, fifth generation aircraft are more likely to be able to do this and survive, allowing multiple sorties instead of one or fewer per individual aircraft.¹¹

While less vulnerable in the air, fifth generation aircraft are just as vulnerable as their predecessors while on the ground. This can be mitigated through the construction of large numbers of aircraft shelters, including many that might be kept empty, to survive missile soaks. This kind of passive defence can aid in the protection of aircraft themselves but does not account for all of the additional support needed to keep those aircraft in fighting condition. Glasstone's *Effects of Nuclear Weapons* gives a rough estimate of the impact of different levels of overpressure necessary to cause damage to many different structures and objects. The stealth element of a fifth-generation aircraft relies on a number of different features: specific angles and absorbent paint, for example. These features are fairly easy to damage. The stealth coating on an F-35, for example, takes a beating at high speeds, rendering it less effective.¹²

While the aircraft could continue to function with damage to the stealth coating, it would be much more vulnerable to air defence systems: as a result, the main advantage it has over fourth generation aircraft would be lost. The *Effects of Nuclear Weapons* shows that aircraft are severely damaged at less than 5 PSI.¹³ Similarly, a PSI of 5 or more seems to be

10 M. Gunzinger, C. Rehberg, and L. Autenried, "Five priorities for the Air Force's future combat Air Force", Center for Strategic and Budgetary Assessments, 22 January 2020, <https://csbaonline.org/research/publications/five-priorities-for-the-air-forces-future-combat-air-force/publication/1>

11 D. Lee James and D. Gouré, "The implications of fifth-generation Aircraft for Transatlantic Airpower: a primer", Atlantic Council: Scowcroft Center for Strategy and Security, 7 October 2019, <https://www.atlanticcouncil.org/in-depth-research-reports/report/the-implications-of-fifth-generation-aircraft-for-transatlantic-airpower-a-primer/>

12 V. Insinna and D. Larter, "Supersonic speeds could cause big problems for the F-35's stealth coating", *Defense News*, 13 June 2019, <https://www.defensenews.com/air/2019/06/12/supersonic-speeds-could-cause-big-problems-for-the-f-35s-stealth-coating/>

13 Glasstone, *The effects of nuclear weapons*, p.194.

enough to slam delicate electronic maintenance equipment into other objects, or throwing objects into any equipment that remains static, making it useless without replacements.¹⁴ On the assumption that a 5 PSI overpressure is adequate to damage most fifth generation aircraft, or at least render the stealth element unlikely to function, we can use (as a very rough estimation tool) Alex Wellerstein's NukeMap estimator to provide the following overlay of 20-kiloton surface burst strikes. These are quite small warheads, easily delivered by a number of vectors, including the ever-present TEL.

A single 20-kiloton nuclear weapon launched against the fifth generation airbase in Leeuwarden, in the north of The Netherlands, would produce an estimated 260 fatalities, with upwards of 3,100 injured according to NukeMap's population estimates. Actual fatalities would likely be higher due to radiation and fire effects. Despite the ease with which they could eliminate the conventional air capability at each location with a single warhead, the estimated casualties based on population density are quite low. Even assuming a higher population on a military base at times of increased tension, it is unlikely to increase beyond the ten-fold estimates here.

Target acquisition experts do not need to destroy the aircraft themselves to remove them from service. They simply need to render them unusable for service in the theatre. This may mean focusing on the destruction of fuel, ammunition, personnel and maintenance equipment, rather than the aircraft themselves. Maintenance equipment, especially that required by the F-35, is expensive and difficult to move. Each country is likely to only have one Tier-I F-35 repair facility. Tier-II maintenance will be contracted out to a facility in the United Kingdom.¹⁵ Any aircraft requiring Tier-III maintenance would likely be out of action for quite some time.

The following locations are likely to host a variety of NATO member fifth generation aircraft at some point in the next ten years, based on current air-basing available in various nations' air forces' websites, and the locations of Lockheed Martin support offices: Leeuwarden (Netherlands), Orland (Norway), Skrydstrup (Denmark), Amendola (Italy), Treviso (Italy), Florennes and Kleine Brogel (Belgium). If we also assume that NATO will continue to use the British Tier-II repair facility, this is still a very small number of targets. Eight weapons at a fairly low yield should be enough to eliminate, at least temporarily, the threat of fifth generation aircraft against Russian forces. To bring that threat back to bear, in the region, the United States would need to send the rest of its fifth generation fleet to the theatre, where it, too, could be rendered ineffective, in the same manner.

¹⁴ Glasstone, p.206.

¹⁵ G. Reim, "Pentagon lays out F-35's Tier II global repair network", *Flight Global*, 12 February 2019, <https://www.flight-global.com/systems-and-interiors/pentagon-lays-out-f-35s-tier-ii-global-repair-network/131360.article>

In short, eight low-yield nuclear weapons, aimed effectively, could completely destroy NATO's immediate conventional response capabilities. This could be achieved without massive military or civilian casualties or destruction to civilian infrastructure. It would be a reminder of the potential power of nuclear weapons, wielded effectively. With a total nuclear yield of under 200 kilotons, the NATO air response could be stopped in its tracks.

Blue counter-military options

A war between NATO and Russia would also see the involvement of Russian ground forces. Russian air units are comparatively weak, and thus are unlikely to play a large role in any ground combat, especially if NATO attack aircraft are nearby. Should NATO choose to use nuclear weapons against conventional Russian capabilities, what targets would be available? Striking at an advancing armoured column might seem attractive, but will do remarkably little damage, for several reasons. First, an armoured column in dispersed road-march columns is considerably harder to damage than a staged parking area of tanks. Second, given the paucity of NATO forces in the Baltic states, it is unlikely that any major push by Russian forces would be vigorously opposed. Third, assuming that the Russian forces chose to road march at a slower than average pace, they would still only need to cover a short distance (270 km from Pskov to Riga, and considerably less than that from Belarus to Vilnius, Kaunas, or Kaliningrad.) The Lithuanian Riflemen would likely attempt some form of intervention, but without the appropriate gear, even well-trained civilians will struggle to stop armoured columns. Even assuming a much-reduced speed of 10km an hour, largely unopposed, the land-bridge is easily completed in two days. Instead of being parked in one area, these forces would be moving in columns. Finally, given the possibility of nuclear attack, they would likely be moving in a dispersed mode, spread out enough so that no individual low-yield weapon would be able to take out an entire column. Additionally, tanks provide a degree of radiation shielding to any crew members inside. If the tank is fully buttoned up, it could, in theory, prevent up to 96 percent of radiation from reaching the crew members inside.¹⁶ Inevitably, the crew will exit the vehicle and likely be exposed to the radiation upon exit. They could, however, stay put long enough to reach their target. Should they spend several hours, or days buttoned up, they could wait out the radiation, until it has reduced to a lower level. Assuming that not every tank will successfully button up, we can reduce the shielding estimate from 96 percent to 80 percent. A 20-kiloton surface burst would result in about a 1km radius of 5,000 rem and a 1.25km radius of 1,000 rem. With an 80 percent shielding factor from the armoured vehicles, any

16 "Armored vehicle shielding against radiation", Ft Belvoir, US Army Nuclear and Chemical Defense Agency, 1979.

personnel inside a tank along a 2km stretch of road would get a 1,000-rem dose, likely resulting in severe illness and eventual death. Anyone outside that area might be exposed to enough radiation to render them quite ill, but some could likely continue. Some units might panic or flee, increasing the effects, but a dispersed column that expected a potential nuclear attack could space out tanks and infantry enough to reduce casualties and fatalities.

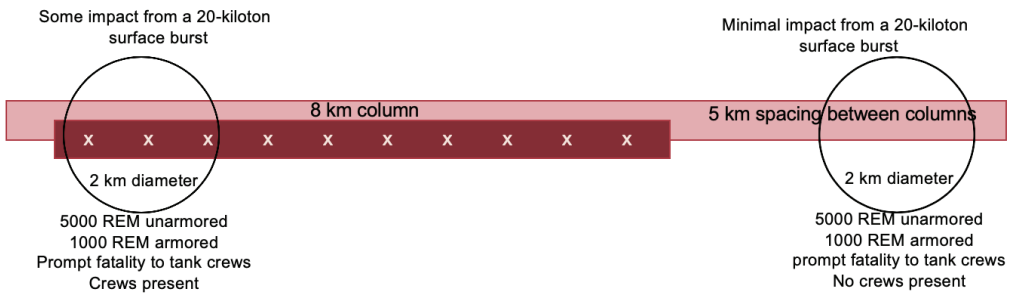


Figure 1: Impact of a low-yield nuclear attack on armoured columns¹⁷

Even without planning for a possible nuclear strike, spacing makes battalion tactical groups (BTGs) less vulnerable to battlefield nuclear use. One BTG takes up to 12 hours to cover 350 km on paved roads.¹⁸ At a bare minimum, the BTG will take up an eight km stretch of road with 5 km between it and the next. This means about 10 tanks over eight km, with enough space between each BTG to avoid any immediate radiation impact on two BTGs at once. While a number of other vehicles, especially those with much lower shielding factors, would likely be destroyed, the ultimate fire power of the unit would be preserved. Many troops would die in the process, but a single small nuclear weapon would be unlikely to damage more than 2-3 tanks at any given time. The only way for there to be a higher impact on ground forces would require striking Russian troops at a mustering site, either in Russian or Belarussian territory prior to an invasion, or outside of where they massed to attack. The first would most likely be deemed too much of a provocation by most NATO members, and the second would involve striking Russian troops on NATO

¹⁷ The author would like to acknowledge the value of conversations with Yvonne Crane and Dave Frelinger of the RAND Corporation in the early development of this figure.

¹⁸ L. Grau and C. Bartles, "The Russian way of war: force structure, tactics, and modernization of the Russian ground forces", Fort Leavenworth, Kansas, Foreign Military Studies Office, 2016, p.148, <https://www.armyupress.army.mil/Portals/7/Hot%20Spots/Documents/Russia/2017-07-The-Russian-Way-of-War-Grau-Bartles.pdf>

territory, possibly with NATO troops and NATO civilians downwind of any potential fallout. Neither scenario would provide much military benefit to NATO, and both might cause irreparable internal political rifts.

Unless NATO plans on some kind of retaliatory strike on Russian territory, these are not sensible choices from a military perspective. The option of retaliatory strikes on strategic locations in Kaliningrad need to account for prevailing winds when considering the possibility of fallout onto NATO territory and NATO civilians, and military units being affected by radiation and overpressure. Moreover, any attack on strategic sites in the Kaliningrad area (and elsewhere) might have a long-term effect on Russian military capability, but will not ultimately affect the conventional correlation of forces under these circumstances. The Baltics would still be vulnerable to conventional threat.

In short, it would be extremely difficult for any number of low-yield nuclear weapons used on the battlefield to have desirable effects in NATO's interests, without also creating extremely unpleasant side-effects for NATO personnel and civilian populations. There are few, if any, reasonable uses of nuclear weapons on the battlefield in a way that could conceivably halt forward movement from a prepared, armoured adversary. Nuclear weapons targeting Russian forces would need to be used for something other than battlefield operations. Even strategic uses would have potentially serious side-effects for NATO forces, even without accounting for the possibility of retaliation.

What is targeted, matters

Outside of counter-military and counter-force operations, nuclear weapons can also be used for counter-value attacks. Counter-value attacks strike what is valued by the adversary, often economic centres with civilian populations. Considering the same weapons suggested for counter-military and counter-force attacks, a single 20-kiloton attack against a densely populated city would do very different things. Even though it is nearly identical to what we applied earlier to air bases, nuclear storage sites, and armoured columns, i.e. tailored to airburst, optimizing for the widest possible ring of 5-10 PSI overpressure, it could kill tens of thousands immediately. In a city like Frankfurt, Germany, for instance, such an attack would kill well over 50,000 people immediately, with an additional 140,000 people in danger of death later from injuries and radiation sickness. In the NukeMap estimates, there is a 24-hour-average population of nearly 400,000 people in the 1 PSI blast range: that is to say, vulnerable to injury from flying objects, as well as any conflagration effects.¹⁹ NATO

19 These effects are mere estimates, and the reality could be quite different, especially given the uncertainty around fire effects. See: L. Eden, "Whole world on fire: organizations, knowledge, and nuclear weapons devastation", Cornell Studies in Security Affairs, Ithaca, NY, Cornell University Press, 2004. Nuclear effects on a modern city could be quite different from

member states in Europe have many more densely populated centres than does Russia. Increasing the number of nuclear weapons in NATO territory in Europe will not reduce the number of cities available to strike, should an adversary choose to do so; more weapons in the mix will not reduce this vulnerability.

The scenarios offered in this paper should not be considered likely given the current political climate. However, the postures and their vulnerabilities should be seriously considered. Both NATO and Russian nuclear forces have impressive arsenals that can cover a wide range of targets. Any individual Russian strike, however, will have more impact than an equivalent NATO one. This is because NATO's posture does not seriously take into account nuclear strikes. Adopting a more defensive posture could enable the Atlantic Alliance to reduce its vulnerability to nuclear weapons considerably. More specifically, Russian nuclear policy is explicit: nuclear weapons are not to be used to escalate wildly. However, there are reasonable, extremely effective use cases for Russian nuclear weapons that would crush NATO conventional capabilities in Europe. A single 20-kiloton weapon launched at a nuclear storage site could destroy much of NATO's nuclear capability. A single 20-kiloton weapon launched at particular airfields would render many conventional capabilities helpless. This kind of attack is understandable from a military perspective. NATO can reduce the effectiveness of such an attack, not by increasing nuclear weapons stockpiles, but by improving its defensive posture. Improving that posture will reduce the usefulness of such a strike. Otherwise, such strikes will remain reasonable options. Unless NATO rearranges its posture, it will continue to be a fighter with a glass jaw, needing only a single blow to knock it out.

the only historical examples we have. However, it should be sufficient to say that casualties and fatalities in these instances would be considerably higher than we would see in somewhat isolated, largely rural, military locations.

Nuclear weapons in Germany: mitigating a hypothetical end of the nuclear-sharing arrangements

Alexander Sorg

Germany is currently part of the nuclear-sharing arrangements within NATO, like Belgium, Italy, The Netherlands and Turkey. This agreement consists of both hosting US nuclear weapons and possessing Dual-Capable Aircraft (DCA) for tactical nuclear strikes. In the past years, discussions in Germany about nuclear weapons have gained increasing prominence and scepticism towards German policy has probably grown. While it is rather unlikely that Germany would directly terminate its participation in the arrangement, a “soft-exit”, in which the country does not renew its ageing DCA fleet, might be more probable. This article is agnostic about a possible termination and does not assess the wisdom of such a choice. Rather, it identifies the policies a German government would have to adopt – if the country ever decided to terminate its participation – in order to mitigate any negative effects. Ending nuclear sharing should in fact only take place on the basis of a broad consensus within the Alliance, i.e. without undermining solidarity or exacerbating burden sharing. This may include increasing defence spending, leaving the Nordstream2 pipeline and convincing Russia to comply with arms control agreements. These policies are, however, neither easy to achieve nor do they find much support within Germany.

Germany, nuclear weapons and the internal debate

Nuclear weapons deployments have been the cause of controversy in Germany since they were first introduced by the US in 1955. The most prominent expression of this controversy was the protests against NATO’s Double-Track Decision in the 1980s, when the US planned the deployment of intermediate range nuclear forces in Germany and

other states in Western Europe. After the end of the Cold War, significant segments of the German population continued to question the necessity of nuclear weapons deployments. This explains why there have been recurring debates about terminating Germany's status as a nuclear host in the past 30 years. In 2009, most prominently, the centre-right Free Democratic Party (FDP) successfully introduced a paragraph on Germany's intention to end the country's hosting of nuclear weapons into the coalition agreement with the Christian Democratic Union (CDU).¹ One year later, a majority of government and opposition parties in the German parliament passed a resolution that called upon the German government to work toward an ending of US nuclear weapons deployments.² Led by former Foreign Minister Guido Westerwelle, the FDP actively tried to move from mere intentions to actions.³ However, the plan was eventually stopped after deliberations within NATO.⁴

A decade later, the debate has once again reached public prominence because of a pending decision to renew the country's ageing Dual-Capable Aircraft (DCA), which are assigned to carry US nuclear weapons in case of war. The US exit from the INF Treaty in 2019 further exacerbated the public debate. The co-ruling Social Democrats (SPD) reacted by introducing an internal commission that is tasked with re-evaluating the costs and benefits of hosting nuclear weapons in Germany.⁵ However, it was only after the German Ministry of Defence announced plans to buy 45 F-18 aircraft from the US that the topic became heatedly debated. Thirty of the 45 F-18s are planned to be used as DCA. Thus, they would guarantee that Germany continues to fulfil its role as a nuclear host. While the SPD appeared split on this issue, Chancellor Angela Merkel's CDU positioned itself clearly in favour of continuing the hosting of nuclear weapons.⁶

1 J. Borger, "Germans press for removal of US nuclear weapons in Europe", *The Guardian*, 6 November 2009, <https://www.theguardian.com/world/2009/nov/06/germany-removal-us-nuclear-weapons>

2 Deutscher Bundestag, "Antrag der Fraktionen CDU/CSU, SPD, FDP und BÜNDNIS 90/DIE GRÜNEN: Deutschland muss deutliche Zeichen für eine Welt frei von Atomwaffen setzen", 24 March 2010, <http://dipbt.bundestag.de/dip21/btd/17/011/1701159.pdf>

3 G. Benzow, "Westerwelle repeats call for withdrawal of NATO Nuclear Weapons", *Deutsche Welle*, 11 November 2010, <https://www.dw.com/en/westerwelle-repeats-call-for-withdrawal-of-nato-nuclear-weapons/a-6219878>; B. Vestring, "US-Atombomben Bleiben", *Frankfurter Rundschau*, 5 September 2012, <https://www.fr.de/politik/us-atombomben-bleiben-11333913.html>

4 Der Spiegel, "Nuclear weapons likely to stay in Germany", *Spiegel International*, 11 October 2010, <https://www.spiegel.de/international/germany/nato-strategy-paper-nuclear-weapons-likely-to-stay-in-germany-a-722435.html>; O. Schmidt, "Deutsche Außenpolitik Und Die Zukunft Der Nuklearen Teilhabe in Der NATO: Eine Analyse Der Jahre 2009 Bis 2012", Berlin, Miles-Verlag, 1 January 2017.

5 B. Pancevski, "In Germany, a Cold War deal to host US nuclear weapons is now in question: debate about US nuclear weapons in Germany flares up for the first time since the 1980s", *The Wall Street Journal*, 1 January 2019, <https://www.wsj.com/articles/in-germany-anger-at-trump-throws-cold-war-nuclear-pact-into-question-11549976449>

6 SPD parliamentary group leader, Rolf Mützenich, commented on the developments by questioning the necessity of nuclear weapons in Germany. He was supported by both co-leaders of his party. However, other voices within the SPD, such

Out of the four opposition parties in the German parliament, the Greens and the Left, having taken a clear stance for years in favour of signing the Nuclear Ban Treaty, are against the continuation of nuclear weapons deployments in Germany.⁷ The FDP, conversely, now seems to have gone full circle and is actively supporting the hosting of nuclear weapons.⁸ The extreme right, opposition party *Alternative für Deutschland* (AfD) has a peculiar position. Its 2019 policy paper stated that Germany has a vital interest in the nuclear sharing arrangement “until an equivalent alternative becomes available”.⁹ Yet, the AfD on principle rejects any strengthened role of the European Union in security and defence policy. This ambivalent position has been developed further by AfD MP Gerold Otten who recently stated that Germany must not end the deployment of nuclear weapons unilaterally and that the current security landscape does not allow for a change in the status quo.¹⁰

How to think about the future of the nuclear-sharing arrangements

From looking at current political forces represented in the German parliament, support for the continuation of nuclear weapons deployments does not seem unanimous. These trends could strengthen further in the years ahead: recent polls have in fact highlighted noteworthy degrees of scepticism toward nuclear sharing and nuclear weapons in Germany.¹¹ For example, according to a survey from the Munich Security Conference, only 31 percent

as Foreign Minister Heiko Maas and security policy expert Fritz Felgentreu opposed their colleagues.

Frankfurter Allgemeine Zeitung, “Kramp-Karrenbauer Wirft SPD Schwächung Deutschlands Vor”; H. Monath, “Es Wird Zeit, Dass Deutschland Die Stationierung Zukünftig Ausschließt”, *Tagesspiegel*, 3 May 2020, <https://www.tagesspiegel.de/politik/spd-fordert-abzug-aller-us-atomwaffen-aus-deutschland-es-wird-zeit-dass-deutschland-die-stationierung-zukuenftig-ausschliesst/25794070.html>; H. Monath, “Maas Verteidigt Atomwaffen in Deutschland”, 5 May 2020, <https://www.tagesspiegel.de/politik/nach-kritik-von-spd-fraktionschef-maas-verteidigt-atomwaffen-in-deutschland/25800170.html>; K. Schuller, “SPD Streitet Über Nukleare Teilhabe Deutschlands”, *Frankfurter Allgemeine Zeitung*, 2 May 2020, <https://www.faz.net/aktuell/politik/inland/spd-streitet-ueber-nukleare-teilhabe-deutschlands-16751148.html>

7 K. Keul, *et al.*, und der fraktion bündnis 90/die Grünen, Antrag “Nukleare Teilhabe beenden – Atomwaffen aus Deutschland abziehen”, Deutscher Bundestag, Drucksache 19/20065, 16 June 2020, <https://dipbt.bundestag.de/doc/btd/19/200/1920065.pdf>; Bündnis 90/Die Grünen, “Grundsatzprogramm”, 2020, <https://www.gruene.de/grundsatzprogrammprozess>

8 H. Möhle, “FDP Fordert von SPD Bekenntnis Zur Nuklearen Teilhabe”, *General Anzeiger*, 24 April 2020, https://www.general-anzeiger-bonn.de/news/politik/deutschland/fdp-fordert-von-spd-bekenntnis-zur-nuklearen-teilhabe_aid-50217175; Tagesschau, “Streit Über US-Atomwaffen in Deutschland”, 3 May 2020, <https://www.tagesschau.de/inland/nukleare-teilhabe-streit-101.html>

9 Arbeitskreis Verteidigung der AfD-Bundestagsfraktion, “Streitkraft Bundeswehr: Der Weg Zur Verteidigungsfähigkeit Deutschlands”, 1 January 2019, <https://www.afdbundestag.de/wp-content/uploads/sites/156/2019/06/Endfassung-SK-Bundeswehr-26.06.pdf>

10 G. Otten, “Abzug von US-Atomwaffen Aus Deutschland - Gerold Otten - AfD-Fraktion Im Bundestag”, AfD-Fraktion Bundestag, 8 May 2020, <https://www.youtube.com/watch?v=Icw67UOJ-Is>

11 K. Egeland and B. Pelopidas, “European nuclear weapons? Zombie debates and nuclear realities”, *European Security*, 10 December 2020, <https://doi.org/10.1080/09662839.2020.1855147>

of Germans would like to continue reliance on nuclear deterrence and of these, only 24 percent would like deterrence to rely on US nuclear weapons. This could incentivize political opposition to nuclear sharing. However, it is important to highlight a key feature of German politics: political parties generally tend to move from an idealist to a realist foreign policy once they enter government.

NATO is a nuclear alliance of democracies based on consensus and nuclear sharing is at the heart of the Alliance. The modernization of the European fleet of dual-capable aircraft and the evolution of US nuclear strategy, posture and force structure, as well as Russia's growing nuclear capabilities, exert different pressures on the nuclear-sharing arrangement, as well as on the Alliance's internal cohesion.

Rather than asking whether Germany or other members of the nuclear-sharing arrangement should stay or change their posture, I discuss the policies a German government might want, or need, to adopt in order to mitigate the negative effects resulting from leaving the nuclear-sharing agreement. Nuclear-sharing is a political issue, not a military matter, and thus both the rationale and the consequences must be assessed politically, more than militarily. In the next sections, I suggest that Germany takes bold measures in terms of burden sharing, solidarity and with respect to Russia in order to compensate for its hypothetical departure from the nuclear-sharing agreement. This exercise is helpful analytically, both to understand on what areas the German government would have to compromise as well as to reflect on the acceptability of those proposals.

Risk- and burden-sharing

Nuclear-sharing is said to be inherently linked to risk- and burden-sharing. However, in the hypothetical situation of Germany leaving the nuclear-sharing arrangement, it would not have to take any particular measure to address risk-sharing issues: in contrast to what many supporters of the end of the nuclear-sharing agreement argue, Germany would still remain a target in a war between NATO and an adversary. In fact, the US operates a number of key military bases in Germany, such as Ramstein, and NATO has a number of key facilities in the country, such as the logistics centre in Ulm or the AWACS base in Geilenkirchen. Jessica Cox, Director of the NATO Nuclear Directorate, notes that expelling nuclear weapons will not necessarily keep NATO states out of Russia's nuclear crosshairs.¹² Germany, however, would probably have to take major measures when it comes to burden-sharing. Already today, Berlin is facing pressure for its alleged free-riding. It will not meet NATO's military

12 J. Cox, "Exclusive online briefing on NATO's nuclear deterrence", RUSI, June 2020, <https://rusi.org/event/exclusive-online-briefing-nato%E2%80%99s-nuclear-deterrence>

spending target of 2 percent of its GDP by 2024, and at best it will succeed only by 2031.¹³ Moreover, the German government is also falling short on a second pledge, namely to spend 20 percent of the defence budget on equipment.¹⁴ These failings have understandably led to criticism especially from the former US administration.¹⁵ Consequently, proposals to end nuclear deployments would need to be linked to a significant increase in burden sharing – and a first step would be to put more effort into meeting these “percentage goals”.

Three other issues deserve attention. First, Germany should be able to guarantee that it can effectively use its military in current deployments, such as in the Enhanced Forward Presence mission. The country should at least be able to contribute effectively to the Alliance’s existing reassurance and conventional deterrence missions, before it can leave the nuclear sharing arrangement. Second, and related, non-nuclear members could still help shoulder the burden of a nuclear mission by participating in NATO’s Support of Nuclear Operations With Conventional Air Tactics (SNOWCAT) mission. Germany could join other nations in training missions to support US strategic bombers with air refuelling, search and rescue operations and the suppression of air defence systems.¹⁶ In case of war, Germany would of course be able to suspend these obligations. However, this also applies to a possible refusal to use the dual-key nuclear weapons stationed in Germany today. Lastly, Germany could offer to contribute financially to NATO infrastructure that supports the Alliance’s deterrence posture. The Eastern Flank would be particularly weak should follow-on forces arrive: this is because of the limited logistics infrastructure they can count on, such as airports, ports, and railways. Given that the European Union has recently reduced funding for these projects, it would help if Germany could shore up transatlantic solidarity by stepping in.

13 A. Taylor, “Germany finally pledges to increase military spending to NATO levels, but Trump still won’t be happy”, *The Washington Post*, 8 November 2019, <https://www.washingtonpost.com/world/2019/11/08/germany-finally-pledges-increase-military-spending-nato-levels-trump-still-wont-be-happy/>; *Deutsche Welle*, “Merkel vows to hit 2% NATO spending target ‘by Early 2030s’”, 27 November 2019, <https://www.dw.com/en/merkel-vows-to-hit-2-nato-spending-target-by-early-2030s/a-51432189>

14 K.H. Kamp, “Myths surrounding the two percent debate: on NATO defence spending”, Working Paper 9/19, Bundesakademie für Sicherheitspolitik, September 2019, <https://www.baks.bund.de/de/node/2036>

15 Taylor, “Germany finally pledges to increase military spending to NATO levels, but Trump still won’t be happy”.

16 K. H. Kamp and R. C.N. Remkes, “Options for NATO nuclear sharing arrangements”, in *Reducing nuclear risks in Europe: a framework for action*, Nuclear Threat Initiative, 2011, pp.76-95, <https://www.nti.org/analysis/articles/reducing-nuclear-risks-europe-framework-action-full-report/>

Solidarity

The nuclear-sharing arrangement is at the heart of the Alliance, and thus a responsible German government interested in enhancing – rather than damaging – transatlantic solidarity should pay particular attention to making sure that its allies are reassured about its commitment. With respect to nuclear weapons, a few issues deserve attention: the German government should clearly state its support for NATO's nuclear deterrence posture and its commitment to strengthening it when necessary. In this respect, the German government should contribute to explain how NATO should react to the continued presence of up to 2,000 active tactical nuclear warheads in the Russian arsenal. Second, an agreement on withdrawing nuclear weapons could carry a clause that would allow for the redeployment of nuclear weapons at any time. To ensure that this were possible, the infrastructure to host nuclear weapons would remain intact for the coming years, even without any nuclear weapon deployments.

Finally, if Germany wanted to end its status as a nuclear host state, it should compromise on other but related issues. Thereby, it could prove that it stands in solidarity with its European partners – especially the Central and Eastern European states. While Germany prides itself on being a champion of multilateralism, it has caused considerable controversy by taking unilateral decisions in recent years. For example, Germany is continuing to support the Nord Stream 2 project, which would replace Poland, the Baltics and Ukraine as transit states for natural gas.¹⁷ This does not only entail financial costs for these countries, but it also makes it easier for Russia to pressure them politically. Moreover, especially in the case of Poland, such a German-Russian partnership is connected to a painful past, when Germany and the Soviet Union brutally decided the country's fate.¹⁸ Nord Stream 2 is also counterproductive with respect to the sanctions against Russia over its incursion into Ukraine, and thus, heavily criticized by the latter.¹⁹ In addition, the US has clearly expressed its concern multiple times, and has even introduced sanctions against businesses involved in Nord Stream 2, although it has recently given the green light to the project.²⁰ Since NS2 is closely connected to the issue of Russian influence in Europe, a termination of the project could mitigate fears that Germany does not stand in solidarity with its allies. What is important then, is that Germany clearly connects these issues to nuclear sharing, to signal

17 C. Bleiker *et al.*, "Nord Stream 2: Der Ewige Zankapfel", *Deutsche Welle*, 19 November 2020, <https://www.dw.com/de/nord-stream-2-der-ewige-zankapfel/a-51270076>

18 Bleiker *et al.*

19 "Ukraine secries Nord Stream 2 approval, says it weakens Europe", *Reuters*, 31 October 2019, <https://www.reuters.com/article/us-ukraine-nato/ukraine-decries-nord-stream-2-approval-says-it-weakens-europe-idUSKBN1XA185>

20 "Nord Stream 2: Germany unhappy with new US sanctions", *Deutsche Welle*, 14 June 2020, <https://www.dw.com/en/nord-stream-2-germany-unhappy-with-new-us-sanctions/a-53805296>

to its allies that their strategic concerns are taken into account.

Bringing Russia in

Nuclear weapons do not exist in a vacuum, they exist in reaction to other countries' potential use or threat. The most ambitious and complex task for Germany, before leaving the nuclear-sharing arrangement, would be to bring back Russia into compliance with the arms-control agreements it has been violating for the past decade or so. According to some observers, the withdrawal of tactical nuclear weapons from Europe should only take place, if a deal that includes Russian non-strategic nuclear weapons can be reached with the Kremlin.²¹ This could be achieved in a step-by-step approach. For example, Germany would first suspend the modernization of its ageing dual-capable aircraft fleet in exchange for a withdrawal of Russia's controversial 9M729 missile.²² A second step might include a renewed agreement similar to the INF Treaty, but with verification measures. This could be accompanied by a first reduction of nuclear weapons in Germany. In the end, the process should result in general negotiations about all non-strategic nuclear weapons.

While this would be the ideal scenario, many question marks remain. First, Russia can still hope for a unilateral expulsion of nuclear weapons from one of the host states, which might cause disunity in NATO. Second, even if the nuclear weapons remain deployed in Europe, they are a periodic source of debate and disruption within NATO. Third, Russia has weaponised the issue to claim that NATO states are in breach of the NPT.²³ In this way, it can distract from its own failures. After all, if the Atlantic Alliance was openly breaching the NPT, why should Russia feel bound by arms control treaties? Fourth, NATO's non-strategic nuclear weapons might not be a major military concern for Russia. Indeed, all possible use scenarios can be implemented by other US nuclear weapon systems as well. Consequently, the Russian government could be less willing to support a change of the status quo than common wisdom would suggest. Last, but not least, Russia has been violating several arms control agreements over the recent past. It is difficult to strike agreements with a party that is less interested in respecting them, than in exploiting them.²⁴

21 C. Bildt and R. Sikorski, "Next, the tactical nukes", *The New York Times*, 1 February 2010, <https://www.nytimes.com/2010/02/02/opinion/02iht-edbildt.html>; A. Somerville, I. Kearns, and M. Chalmers, "Poland, NATO and non-strategic nuclear weapons in Europe", Unpublished Work, *Occasional Paper*, London, 1 February 2012, pp.9-12.

22 Kühn, Meier, and Fuhrhop, "Teilhabe Als Chance".

23 W. Alberque, "The NPT and the origins of NATO's nuclear sharing arrangements", *Proliferation Papers*, No.57, Ifri, Paris, January 2017, pp.11-12, <https://www.ifri.org/en/publications/etudes-de-lifri/proliferation-papers/npt-and-origins-natos-nuclear-sharing-arrangements>.

24 N. Egel and J. Vaynman, "Reconsidering arms control orthodoxy", *War on the Rocks*, 26 March 2021, <https://warontherocks.com/2021/03/reconsidering-arms-control-orthodoxy/>

Conclusion

There is a good deal of scepticism about nuclear weapons deployments in Germany, and it has probably been growing in recent years. Predicting what will happen is difficult, yet the scenario of Germany pulling out from the nuclear-sharing arrangement within NATO cannot be ruled out.

The paper is agnostic about this choice, but advances policy recommendations the German government would have to adopt to mitigate any negative effects, were such a decision taken. These policy courses are neither widely popular nor easy to implement. The German government would probably still have to contribute to the elaboration of NATO's nuclear strategy. It would likely have to dramatically increase its defence expenditure in order to signal its commitment to burden sharing. The country would also have to leave the Nord Stream 2 pipeline, into which billions of investments have been poured. Finally, Germany would need to try to strike a major multilateral agreement to bring Russia back into compliance with previous arms control treaties. This list of actions is by no means exhaustive, and opponents of nuclear sharing will have to spend much time on developing ideas that can help to accommodate the concerns of proponents of the current posture. Ending nuclear sharing without offering any concessions would undoubtedly harm Germany's, or any other host state's, international posture and diplomatic relations.

NATO's nuclear narratives in the digital age

Rhys Crilley

The collapse of arms control treaties, heightened tensions between nuclear armed states, concerns of a new nuclear arms race, but also global nuclear disarmament initiatives such as the Treaty on the Prohibition of Nuclear Weapons are making the new nuclear age increasingly uncertain. Longstanding ideas about nuclear weapons, deterrence, and disarmament are all “undergoing unpredictable change”.¹ In this context it is imperative to understand how states, international institutions, and non-governmental organizations use narratives to represent and frame nuclear weapons. This is because narratives – structured stories that link together actors, actions, events, and places through employment – are used to imbue social reality with meaning. In doing so, political actors use narratives strategically “to extend their influence, manage expectations, and change the discursive environment in which they operate”.²

Strategic narratives on nuclear politics matter. States claim legitimacy for their nuclear weapons, their membership of nuclear alliances, and their associated strategies of deterrence through the construction and projection of narratives.³ It is also through narratives that other actors challenge these legitimization claims and present other narratives such as those that advocate for global disarmament. As we enter the new nuclear age marked by “an era of rising disorder”,⁴ understanding how strategic narratives about nuclear weapons – what I refer to herein as nuclear narratives – are produced, circulated, and interpreted is of paramount importance.

Research on emotions in global politics has demonstrated that narratives do not simply appeal to audiences because of their linguistic content, but because of how that

1 R. Legvold and C.F. Chyba, “Introduction: the search for strategic stability in a new nuclear era”, *Daedalus*, Vol.149, Iss.2, 2020, p.8

2 A. Miskimmon *et al.*, *Strategic narratives: communication power and the new world order*, London, Routledge, 2014, p.2.

3 C. Reus-Smit, “International crises of legitimacy”, *International politics*, Vol.44, Iss.2-3, 2007, pp.157-174.

4 R.K. Hersman *et al.*, “The evolving US nuclear narrative: communicating the rationale for the role and value of US nuclear weapons”, *1989 to Today*, London, Rowman & Littlefield, 2016, p.60.

content resonates with, and provokes emotions in their audiences.⁵ Given that successful legitimization rests upon the consent of an audience, one needs to understand how members of the public actually think and feel about nuclear weapons.⁶ With the advent of social media, billions of people can now access information about nuclear weapons and share their own feelings with the rest of the world.⁷ As more and more of the world's population logs online, and as internet usage and social media platforms continue to grow, these technologies will be evermore vital in the creation, sustainment, and contestation of nuclear narratives. This paper analyses NATO's nuclear narratives on social media to better understand how political actors represent nuclear weapons and signal their intentions to others.⁸ It also aims to provide an insight into how expressions of public opinion online may shape nuclear politics.⁹

NATO's nuclear narratives on Facebook

Despite a burgeoning area of research on NATO and strategic narratives, this scholarship remains focused on the conflict in Afghanistan,¹⁰ and little has been written on how NATO uses social media to narrate nuclear weapons. The data used in this study was collected using the social media analytics platform CrowdTangle. This generated a dataset of 4,627 Facebook posts published by NATO over a ten-year period, from when NATO originally joined Facebook in 2010 to the end of 2020. To find relevant posts on nuclear weapons, the dataset was searched for any posts that contained the words “nuclear” or “deterrence”. Of the 4,627 Facebook posts published by NATO during the ten-year period of analysis, only 49 explicitly mention nuclear weapons or deterrence, i.e. a mere 1 percent. This is perhaps surprising given that nuclear weapons continue to be “the foundation of NATO's

5 T. Solomon, “The affective underpinnings of soft power”, *European Journal of International Relations*, Vol.20, Iss.3, 2014, pp.720-741.

6 S.D. Sagan and B.A. Valentino, “Revisiting Hiroshima in Iran: what Americans really think about using nuclear weapons and killing noncombatants”, *International Security*, Vol.42, Iss.1, 2017, pp.41-79; L.L. Koch and M. Wells, “Still taboo? Citizens' attitudes toward the use of nuclear weapons”, *Journal of Global Security Studies*, Vol.6, Iss.3, 2021.

7 H.A. Trinkunas *et al.*, *Three tweets to midnight: effects of the global information ecosystem on the risk of nuclear conflict*, Stanford, Hoover Institution Press, 2020.

8 J. Michaels and H. Williams, “The nuclear education of Donald J. Trump”, *Contemporary Security Policy*, Vol.38, Iss.1, 2017, pp.54-77.

9 B. O'Loughlin, “The impact of the information ecosystem on public opinion during nuclear crises”, in *Three tweets to midnight: effects of the global information ecosystem on the risk of nuclear conflict*, Stanford, Hoover Institution Press, 2020, pp.179-192.

10 J. Ringsmose and B. K. Børgesen, “Shaping public attitudes towards the deployment of military power: NATO, Afghanistan and the use of strategic narratives”, *European security*, Vol.20, Iss.4, 2017, pp.505-528. T. E. Nissen “Strategizing NATO's narratives”, in *Strategy in NATO*, London, Palgrave Macmillan, 2014, pp.157-171. K.A. Wright “Telling NATO's story of Afghanistan: gender and the Alliance's digital diplomacy”, *Media, War & Conflict*, Vol.12, Iss.1, 2019, pp.87-101.

collective security”.¹¹

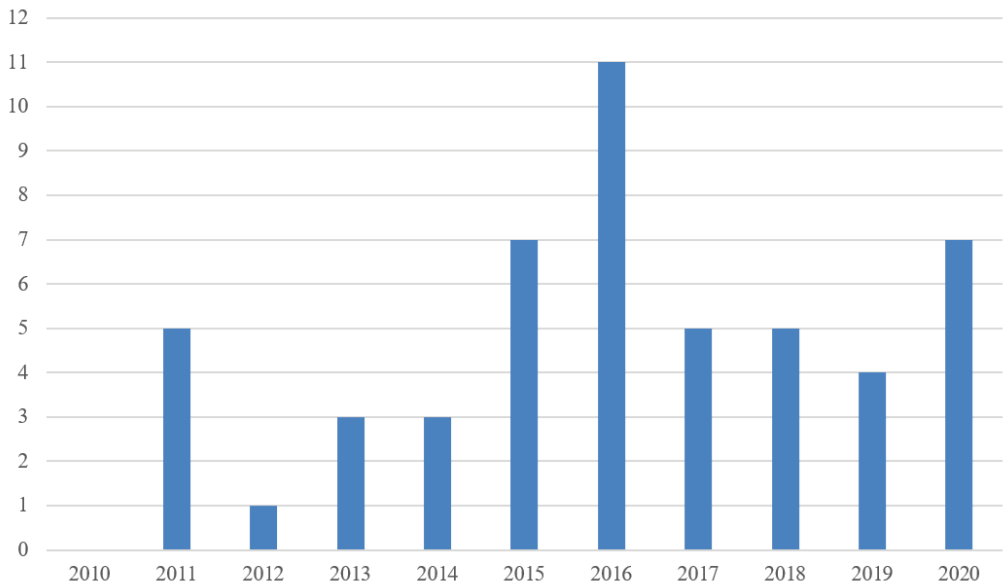


Figure 1: NATO Facebook posts mentioning “nuclear” or “deterrence”

These 49 posts have been analysed according to their main narrative theme, leading to four significant themes. While some of these posts are links to the *NATO Review* and do not therefore represent the official NATO position, they have been included in the analysis as they have been shared on Facebook and do broadly reflect official NATO nuclear narratives. The four main themes are: strategy and the implementation of deterrence; nuclear threats from other actors; NATO’s military preparedness; and nuclear arms control.

Deterrence. One of the major themes in NATO’s nuclear narratives concerns deterrence. Posts on this topic often speak of deterrence in broad terms. Posts about “An important component of NATO’s strengthened deterrence and defence posture [being a] military presence in the eastern and south-eastern parts of Alliance territory” recur, suggesting a notion of collective defence and shared security interests among Allies. One of those most recent posts links to an article written by Jessica Cox, Director of Nuclear Policy at NATO, in June 2020. The post repeats the opening paragraph of Cox’s article in *NATO Review*, and

11 J. Cox, “Nuclear deterrence today”, *NATO Review*, 8 June 2020, <https://www.nato.int/docu/review/articles/2020/06/08/nuclear-deterrence-today/index.html> (accessed 1 September 2020).

features questions to the reader:

Why should #NATO Allies still care about #nuclear deterrence? [...] Why are these weapons still deployed on the territory of a peaceful Europe? Jessica Cox, Director of Nuclear Policy at #NATO, explains in #NATOreview.

While not providing the answers to these questions, the post highlights the importance of deterrence to NATO, given that, as Cox argues, “we still have nuclear weapons because nuclear deterrence is still necessary and its principles still work”.¹² Furthermore, NATO’s nuclear narratives depict deterrence as a necessary feature of NATO’s collective defence. In doing so, these narratives invoke feelings of safety, where deterrence and nuclear weapons are an essential aspect of NATO’s identity and are portrayed as playing a role in maintaining peace.

Threats. Another major theme consists of external threats to NATO. For example, in December 2020 NATO posted about the dangers of CBRN (Chemical, Biological, Radiological and Nuclear) weapons, stating that “NATO faces a whole range of complex challenges and threats to its security including the proliferation of weapons of mass destruction (WMD) and their delivery systems”. NATO’s nuclear narratives depict the current security environment as one of danger and instability due to the actions of other actors such as Russia and North Korea. This is explicitly evidenced by posts from June 2020 mentioning “#NATO’s response to Russia’s nuclear-capable missiles” and a post from July 2016, where NATO stated that

For the Alliance, nuclear weapons play a unique and specific role in its deterrence posture. Their role is to prevent major war, not to wage wars. Even if Russia tends to lower the nuclear threshold, the Alliance does not have to match this policy and to follow this dangerous path.

This suggests that NATO’s nuclear weapons are a source of safety and security whereas those of others are dangerous – with the potential of being used to wage war rather than prevent it – and a source of anxiety and fear.

Preparedness. The third major theme of NATO’s nuclear narratives concerns how the alliance is depicted as a prepared military force. This is done through posts on topics such as military technology, equipment and vehicles as well as about training exercises and deployments. Indicative of this theme are posts from the summer of 2020 that feature military vessels and state that they are “demonstrating #NATO’s continued vigilance and commitment to deterrence and defence in the midst of the #COVID_19 pandemic”. Other posts from November and August 2020 respectively state that NATO nations are “standing

¹² *Ibid.*

together” and “working together... to deter aggression, prevent conflict, and preserve peace”. One post from October 2018 also explains how NATO “delivers deterrence every day” when “#NATO is ready to respond to any threat from any direction”.

Other posts on preparedness provide a more human-interest focused insight such as a video about “Marko” who “is a chemical, biological, radiological and nuclear (CBRN) defence specialist in the Slovenian Army - #WeAreNATO”, and highlight how NATO is prepared for the use of weapons of mass destruction. By focusing on military equipment and personnel, NATO aims to project a sense of security and safety, but also a feeling of pride in an effective, prepared fighting force as part of a shared community of solidarity.

Arms control. The fourth theme of NATO’s nuclear narratives is arms control. These posts represent NATO as a responsible institution, and depict other states and actors as the source of insecurity and recklessness in the area of nuclear arms control. In August 2020 NATO used Facebook to link to a brief history of the INF Treaty, and has made several references to Russian breaches of the INF in 2018 and 2019. In July 2018, NATO also shared a *NATO review* article stating “As the Nuclear Non-proliferation Treaty, or NPT turns 50, it is facing a serious crisis and the stakes are high”. Such posts suggest that NATO is a responsible actor that behaves appropriately and is committed to non-proliferation even in a security environment marked by uncertainty and instability. Another post links to the *NATO review* site and suggests that “Current efforts to ban nuclear weapons will be ineffective and risk undermining the non-proliferation regime, which could have dangerous consequences”.

Ultimately, NATO’s nuclear narratives on arms control draw attention to how other actors are a source of insecurity and uncertainty. These posts position NATO as a source of stability who is committed to current arms control mechanisms while other actors are undermining and jeopardizing them.

How are these nuclear narratives interpreted by the wider public? Examining Facebook comments made in response to NATO’s nuclear narratives sheds light on how people feel about nuclear weapons, beyond opinion polls.¹³

Audience responses to NATO’s nuclear narratives

On average, a NATO Facebook post gains 813 likes, 102 comments, and 179 shares. Since Facebook introduced other “reactions” to posts (such as “Love”, “Wow”, “Haha”,

13 P.N. Chatterje-Doody and R. Crilley “Making sense of emotions and affective investments in war: RT and the Syrian conflict on YouTube”, *Media and Communication*, Vol.7, Iss. 3, 2019, p.175.

“Sad”, “Angry”) we can gain an insight into the “average” emotional response to the posts. A Facebook post published by NATO receives an average of 84 “Love” responses, 12 “Wow” responses, 9 “Haha” responses, 8 “Sad” responses, and 17 “Angry” responses¹⁴. How do NATO’s posts on nuclear weapons compare with this? Those posts receive on average 1,084 likes, 131 comments, and 190 shares. In terms of reactions, on average they prompt 64 “Love”, 8 “Wow”, 4 “Haha”, 3 “Sad”, and 7 “Angry”. These figures seem to show that NATO’s posts on nuclear weapons are likely to gain more likes and provoke more discussion than posts on other topics. However, they are slightly more likely to be shared, don’t provoke as much “Love”, and provoke less “Anger” in the audience. These indicators provide a rather limited account of how people feel towards NATO’s nuclear narratives, so the analysis of comments made in response to NATO’s nuclear narratives on Facebook is necessary.

	Likes	Comments	Shares	Love	Wow	Haha	Sad	Angry
Average NATO post	813	102	179	84	12	9	8	17
NATO post on nuclear weapons	1084	131	190	64	8	4	3	7

Figure 2: Average (mean) number of responses to NATO Facebook posts

During the period of analysis, members of the public posted a total of 6,427 Facebook comments in response to NATO’s nuclear narratives. Rather than quantitatively analysing these, I focus upon comments made in response to several Facebook posts published by NATO that exemplify the four key topics discussed above. These have been selected due to their significance either in terms of the number of comments and responses they received, or because they are on timely and important issues in relation to the new nuclear age (such as posts on the Ban Treaty and on the collapse of the INF Treaty). In total, a sample of 668 comments were analysed, and indicate that five emotions are prominent in how audiences

¹⁴ The averages for likes, shares and comments are based on the mean of all posts. The average reactions are based on the mean of posts published from 24 February 2016 when Facebook introduced the different reactions.

respond to NATO's nuclear narratives.

Pride and support. The first response to NATO's nuclear narratives is a feeling of pride for how NATO and Allies' nuclear weapons have caused peace. These comments are often as simple and as clearly stated as "Proud of NATO!".¹⁵ Others express feelings of thankfulness, and produce a sense of collective identity with the use of the motto "we are NATO". More detailed positive comments state how they accept the notion that NATO and nuclear weapons contribute to peace. These sentiments are also demonstrated in comments that claim NATO and nuclear weapons are "the only reason" Europe is at peace. Subsequently, some audiences accept NATO's nuclear narratives and reproduce the core claims that the continuation of NATO's nuclear deterrent is a guarantor of security and peace.

Disappointment. Alongside expressions of pride and thanks, members of the public sometimes express a feeling of disappointment with NATO's policies in responding to adversaries. For example, one comment in reply to NATO posts condemning Russian breaches of the INF Treaty states "And again, we'll rattle our sabres and sound off in mild disapproval". Such comment expresses disdain for the status quo of international relations. This disappointment in NATO is couched in terms of there being much "talk" but little action in response to the nefarious steps of adversaries. Other comments advocate for "a military blow on Russia" and are rather more hawkish. These comments demonstrate that some audiences accept NATO's framing of external threats and see Russia as an adversary, however they feel disappointed that NATO does not do more to defend against Russia.

Fear and anger towards adversaries. Whereas some comments evidence a disappointment in NATO, others are starker in how they demonstrate feelings of fear and anger towards other actors such as Russia and North Korea. These comments evidence an acceptance of NATO's framing of threats. At times, audiences are considerably critical of the actions of others, for example in critiques of Russian new technologies. However, there are some worrying expressions of violence in comments that want NATO to "erase" enemies "off the face of the earth" and suggest that they "must die!". Alongside these explicit calls for violence are examples of dehumanizing language, as other political actors are deemed to be beyond the realms of reason and diplomacy. These comments imply an understanding of the world as one in which NATO is faced with evil threats who must be confronted with violence. They suggest a sense of both fear and anger towards others such as Russia and North Korea who are viewed only in explicitly adversarial terms, with limited possibilities for diplomacy.

15 All audience comments included are direct verbatim quotes.

Anger at NATO. Anger is also expressed towards NATO itself. Some express disdain that NATO “can only continue to exist by creating threats and new enemies” and are critical of military spending. Alongside these critiques, are expressions of anger based on NATO operations in Afghanistan and Libya. At times these feelings are couched in conspiratorial terms, and claim NATO wants to “control” the world. Even so, the anger expressed towards NATO is difficult to interpret: it may point to a broader waning of trust in established political institutions in the age of post-truth politics but could also indicate that opponents of NATO may more easily raise their voice through digital platforms. Regardless, this anger indicates that some people distrust NATO’s nuclear narratives due to how NATO is perceived as an outdated institution that has recently conducted illegitimate operations.

Fear of nuclear weapons. The final significant emotion expressed by the public in response to NATO’s nuclear narratives is one of fear towards nuclear weapons themselves. This is evident in claims that nuclear weapons are “terrifying” and “madness”. People also suggest that NATO states should take steps to lead the way on disarmament by reducing and removing their nuclear weapons first, with some people expressing concerns that recent actions by NATO members are dangerous. With the collapse of the INF Treaty, one person sarcastically stated that it was “very wise” now that “we all can happily burn in nuclear war”. Others pointed out how contemporary politicians such as Donald Trump are dangerous. And in response to a NATO post on the history of the INF Treaty one commentator states that it was “A time of saner, intelligent, and responsible leaders”. Together, these comments suggest that NATO members share responsibility in creating current nuclear tensions and instability.

Nuclear narratives in the new nuclear age

NATO’s nuclear narratives on Facebook emphasize a commitment to deterrence in the face of external threats, which NATO is prepared for but willing to deal with responsibly through certain arms control mechanisms. Through this messaging NATO’s nuclear narratives are bound up with emotional claims of NATO as a source of safety, security, peace, and pride. This is not, however, exactly how audiences feel about NATO’s nuclear narratives.

Through an analysis of Facebook comments made in response to NATO’s own posts it is evident that NATO is not simply communicating to an echo chamber of supporters who uncritically accept the alliance’s framing of nuclear weapons. These counter narratives

are grounded upon an anger towards NATO as an institution, and operations that are perceived to be illegitimate, as well as a fear of nuclear weapons and worrisome concerns that contemporary events and political leaders in NATO member states are contributing to insecurity.

The new nuclear age may create concerns with new weapons technologies and their impact on strategic stability, yet it is not necessarily hypersonic missiles and artificially intelligent weapons systems that will have the biggest impact on nuclear politics. In fact, new digital communication technologies, and increasing global social media usage may likely reconfigure the very grounds on which the legitimacy of nuclear weapons is claimed and contested. The age of state authority built on a broadcast communication model is over. As more and more people come to social media to critique nuclear weapons, as new platforms develop that enable publics to narrate the world in new, visual, and emotive ways, and as communication itself is reshaped by new technologies, the future of nuclear narratives and the subsequent perceptions of legitimacy they engender remain uncertain.

By using social media, individuals, activists, states, and organizations can seek to shape narratives. At times, this can involve the nefarious use of fake accounts, bots, and astroturf movements designed to look like grassroots support for certain narratives. These developments pose potential challenges for strategic stability, crisis management, as well as non-proliferation and disarmament, and further research is needed to understand the myriad ways narratives and social media shape nuclear politics.¹⁶

Conclusion

The legitimacy of NATO's nuclear deterrent is not only reliant on how well NATO tells this story, but on how well that story resonates with various audiences. As this paper has shown, public views about nuclear weapons are complex, come from contradictory positions, and are expressed in strong, vociferous ways in the digital age. This highlights how difficult it will be for NATO to project convincing narratives that appeal to audiences and therefore build legitimacy for continued nuclear capabilities. As the recent success of the Ban Treaty suggests, nuclear armed states and alliances are confronted with a crisis of legitimacy. In a world wrought by nuclear uncertainty and risk, where nuclear weapons lack international legitimacy, telling "better" stories about nuclear weapons and deterrence may not be

16 H.A. Trinkunas *et al.*, *Three tweets to midnight: effects of the global information ecosystem on the risk of nuclear conflict*, Stanford, Hoover Institution Press, 2020. L. Considine "The importance of narrative in nuclear policy making", *EU non proliferation consortium non proliferation and disarmament Papers*, No.72, January 2021.

the best course of action for NATO. Rather, making more convincing moves towards overcoming the tensions and challenges of the new nuclear age, and communicating these actions clearly and credibly in the on and offline spheres, will be the most effective way forward.

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