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Contours of a Third Nuclear Age

Hans Rühle

Hans Rühle headed the Policy Planning Staff of the German Ministry of Defense from 1982-1988 and is a frequent commentator on German and international security issues.

Michael Rühle

Michael Rühle is Head, Energy Security, in NATO's Emerging Security Challenges Division.

The views expressed are the authors' own.

We still live in the second nuclear age. Unlike the first nuclear age, which was shaped by the bipolar nuclear standoff between the United States and the Soviet Union, the second is shaped by a variety of factors that make nuclear deterrence much more complex: The spread of nuclear weapons has made deterrence a multiplayer game; Asia has emerged as the region with the greatest potential for nuclear conflict; and new nuclear wannabes can benefit from the technological progress made by others ("second-mover advantage") as well as from the emergence of semi-private nuclear supply networks.¹ These features of the second nuclear age have proven remarkably persistent. Consequently, arguments that there is a third or even fourth nuclear age have failed to convince.²

It is nevertheless useful to think about the developments that could herald the advent of a third nuclear age. With a new 2017 Nuclear Posture Review (NPR) currently underway, the United States is set to re-think once more the role of – and the complex relationships between – conventional and nuclear deterrence, extended deterrence, proliferation, and missile defense. The 2017 NPR will have to guide US nuclear policy in an era marked not only by increased strategic competition between nuclear powers, but also by political, technological and even legal developments that pose considerable uncertainty, including entirely new challenges to the theory and practice of nuclear deterrence.



A Third Nuclear Age

Below are six such developments that could lead to structural changes of the global nuclear order that might be justifiably termed the “third” nuclear age. Some are simply the results of ongoing trends, others are wildcards that might upset the nuclear order literally overnight:

1. Nuclear use. It is arguable whether more than seven decades of non-use of nuclear weapons constitute a true “nuclear taboo”. However, the actual employment of a single nuclear weapon – even if it were only intended for “signaling” purposes and would not cause major casualties³ – would be a game changer of tremendous significance. It would further deepen the rifts that characterize the current nuclear debate. For some, it would reinforce the conviction that nuclear deterrence remains essential for prevailing in a nuclearized world, perhaps spurring a shift towards a greater emphasis on “deterrence by denial”, e.g., through missile defense or civil defense schemes. Others, however, would see nuclear use as a sign that nuclear weapons have failed as a means of inducing restraint in international relations. Consequently, nuclear zero could move from a fringe issue into the mainstream, putting tremendous pressure notably on Western Nuclear Weapons States and their allies.
2. A major accident in the nuclear military infrastructure of a Nuclear Weapons State (NWS). Whether through sabotage or simply through insufficiently trained staff, a major accident could foster the perception among the broader public that nuclear are a no longer a security provider but a security liability. Similarly, a cyberattack against the nuclear weapons infrastructure of a NWS that would lead to a manifest loss of control over nuclear weapons could fundamentally change the perception of the military utility of nuclear weapons. The very realization that a Nuclear Weapons State may not always be in full control over its nuclear arsenal could massively erode public confidence. As with the case of actual nuclear use, views as to the appropriate remedy will differ. Nuclear zero arguments – which have always included warnings about an alleged lack of physical security of weapons or infrastructure – would certainly grow stronger. Although no Nuclear Weapons State is likely to scrap its arsenal due to an accident, governments may find it much harder to justify their nuclear deterrence policies if the supporting infrastructure is viewed as inherently unsafe.
3. Nuclear terrorism. Given the well-documented nuclear ambitions by several terrorist groups such as Al Qaeda, the threat of non-state actors acquiring nuclear weapons has been a persistent feature of the “second” nuclear age. However, building a nuclear weapon still requires an elaborate (state) infrastructure. Similarly, the likelihood of states transferring nuclear weapons to terrorists may be limited. Should terrorists nonetheless manage to reach their objective and credibly threaten nuclear use, or should a fundamentalist regime come to power in a Nuclear Weapons State, a new nuclear age would have arrived: The *Absolute Weapon* (as dubbed by Bernard Brodie) would finally be available to actors driven by absolute hatred, the will to inflict mass casualties and few if any apparent inhibitions. With religious justifications for mass murder and the glorification of martyrdom entering the nuclear equation, the rules of the first and second nuclear age would be unhinged. Nuclear deterrence would remain an essential tool for managing interstate relations, yet its limits in the face of non-rational actors could severely reduce that concept’s perceived value.



4. A nuclear tipping point. Thus far, fears that nuclear proliferation would follow a nuclear domino effect have turned out to be unfounded. Despite the spread of civilian nuclear power and the dissemination of technology and knowledge to build a bomb, the number of countries that have chosen to become nuclear powers has remained low. This could change fundamentally under plausible conditions. For example, a new nuclear hegemon emerging in a volatile region could compel several neighbors to make use of the “plutonium option”, i.e. using their civilian light water reactors to produce weapons-grade plutonium.⁴ As light water reactors continue to spread, the number of states that could acquire a “breakout” capability will grow as well. Should a major change in their security environment compel them to become nuclear powers, it would constitute a third nuclear age: such a “proliferation cascade” would not only largely invalidate the non-proliferation efforts of the past 50 years, but also dramatically increase the risk of nuclear conflict.
5. The decline of extended deterrence. The degradation of the credibility of the US extended deterrent could hasten the end of the deal that provides US extended deterrence to allies in exchange for their nuclear abstinence. At this stage, no country under the US “nuclear umbrella” may be serious about its own national nuclear option (though some may deliberately flirt with this possibility in order to clamor for US’ attention). However, should the US appear to waver on its extended deterrence commitments, or should a new major challenger emerge that the US cannot or will not want to balance against, some US allies, particularly in Asia, may well conclude that the time has come to go it alone. This would not only deal a major blow to the global non-proliferation regime, but also to the credibility of US foreign and security policy at large. By demonstrating the limits of the United States as a nuclear protector, strategic rivals could be tempted to test many “red lines” set by Washington.
6. A major change in the legal framework for nuclear governance. Work on a Nuclear Weapons Ban Treaty, which seeks to stigmatize nuclear weapons as illegal, is now well under way. Since the Nuclear Weapons States cannot be bound by a Treaty that they persistently oppose, the Treaty will not lead to global nuclear abolition. However, it could deepen the rift between Nuclear and some Non-Nuclear Weapons States, as well as further polarize the political debates within them. A balanced approach to nuclear deterrence, which acknowledges its moral dilemmas while also emphasizing its security benefits, would become more difficult to sustain if nuclear weapons were deemed “illegal”. Another victim could be the Nuclear Non-proliferation Treaty (NPT), the only almost-universal framework for the regulation of nuclear possession and non-possession. Already under strain by the structural changes of the second nuclear age, the legal stigmatization of nuclear weapons could damage the NPT to the point of obsolescence. Hence, the third nuclear age might well be one without any agreed nuclear governance.

Implications for the Nuclear Posture Review

As with the 2010 NPR, the 2017 NPR is bound to attract considerable international attention. Given the unique role of the United States as a nuclear power that seeks to deter attacks on itself and its allies, while at the same time preventing the further spread of nuclear weapons, the NPR will be a balancing



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act between messages that are aimed at adversaries as well as allies, and at US lawmakers as well as the global NGO community. Drawing from the above analysis, one can identify some key tenets that the new NPR should reflect:

1. A cogent case for nuclear deterrence supported openly and consistently by senior civilian and military officials. North Korea's growing nuclear threat, the return of Russian militarism, the still possible nuclearization of the Middle East, and an accelerating arms race in Asia have fundamentally altered the strategic environment that once informed the 2010 NPR. Reducing the salience of nuclear weapons in US deterrence policy – an objective reflected in all previous Posture Reviews – may remain a sensible goal, but the continued need for nuclear deterrence should be stated clearly and unapologetically. The 2017 NPR should also emphasize the need for a supporting nuclear infrastructure that is both safe and secure. Sustained leadership focus and institutional excellence are as important for the nuclear deterrence mission – and for reassuring one's own population – as are effective forces.
2. A continuing commitment to non-proliferation. In line with a more competitive security environment, the new NPR, unlike its 2010 predecessor, must not put non-proliferation at the top of the agenda. However, a continuing US commitment to non-proliferation remains indispensable. Even in an era marked by renewed great power competition, the proliferation of nuclear weapons to unpredictable regimes like North Korea's and to non-state actors remain among the greatest challenges to US security. Hence, investing in international frameworks that help at least to slow the further spread of nuclear weapons remains a sound policy.
3. A reaffirmation of extended deterrence. The US "nuclear umbrella" for allies remains a major pillar of the global security order, stability and an important non-proliferation tool. Consolidating extended deterrence not only includes maintaining the appropriate military hardware but also the persistent engagement with allies on nuclear strategy, possible arms control, and new challenges such as Russia's nuclear first-use threats and remaining united in the face of a Nuclear Weapons Ban Treaty. Suffice to say, America's allies must fulfill their burden-sharing responsibilities that are a necessary and well-understood part of the alliance bargain. But, as the world inches closer to a third nuclear age, "America first" must not be equated with "America alone".

1. See Keith B. Payne, *Deterrence in the Second Nuclear Age* (Lexington: University Press of Kentucky, 1996); Paul Bracken, *The Structure of the Second Nuclear Age: How Much has Changed, How Much Remains the Same?*, November 17, 2002 [Draft2] <http://oldsite.nautilus.org/gps/scenarios/BrackenSecondNuclearAgeCEIP2002.pdf>.
2. Some failed to provide persuasive evidence that would deserve the label "new", while others employed an entirely different definition of the term. See Karl-Heinz Kamp, "Welcome to the Third Nuclear Age," *The National Interest*, May 2, 2016 (<http://nationalinterest.org/feature/welcome-the-third-nuclear-age-16020>); Ariel



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E. Levite, "Heading for the Fourth Nuclear Age," *IFRI Proliferation Paper*, Winter 2009 (http://carnegieendowment.org/files/Levite_Fourth_Nuclear_Age.pdf).

3. For a counterfactual example of Iraq "warning" the US in the 1991 Gulf War see Stephen Peter Rosen, "Nuclear Proliferation and Alliance Relations," in: Victor A. Utgoff (Ed.), *The Coming Crisis: Nuclear Proliferation, U.S. Interests, and World Order* (Cambridge, MA: MIT Press, 2000), esp. pp. 144-147.
4. The plutonium produced by a light water reactor during its normal operation is ill suited for making a nuclear weapon. However, through chemical separation one can obtain weapons-grade plutonium. For example, if Iran's Busher light water reactor were powered down after 8 months of operation, it would have produced 150 kg of plutonium with a purity level of 90%. This would be sufficient for building more than 20 nuclear weapons.

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