NOTE

# TACTICAL NUCLEAR WEAPONS CANNOT COMPLY WITH THE LAW OF ARMED CONFLICT

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*ABSTRACT*

*The Nuclear Weapons Advisory Opinion is one of the most important pieces of the International Court of Justice's jurisprudence. Delivered in 1996, only a few years after the end of the Cold War, the world watched as the Court proclaimed that no body of international law explicitly bans the use of nuclear weapons in every scenario. This Note analyzes that ruling and its subsequent interpretations and argues that it is short sighted. The Court believed that use of all nuclear weapons may be illegal, but that the Court lacked sufficient facts to determine whether that was true in every scenario. The exemplary issue showcasing legality was self-defense. This Note argues that the Court should have distinguished tactical from strategic nuclear weapons and should have prohibited any use of tactical nuclear weapons. As will be discussed, tactical nuclear weapons are incapable of providing self-defense when the very survival of the state is at risk, provide no greater military advantage than conventional weapons, and cause indiscriminate effects in the form of the uncontrollable spread of radiation. This Note, like the Court in its opinion, does not comment on or argue about deterrence as a matter of policy. Nor does this Note comment on the legality of use of strategic nuclear weapons in self-defense. The scope of this Note is limited to arguing that the Court should have held that tactical nuclear weapons are different than strategic nuclear weapons, and should have held that the use of tactical nuclear weapons is, or would be, per se illegal.*

## *I. INTRODUCTION*

Nuclear weapons pose an existential threat to humanity because they are unimaginably destructive and can kill by

tremendous blast, extreme heat, and indiscriminate radiation.[1] One subset of "nuclear weapons" is tactical nuclear weapons, which are defined as low-yield nuclear warheads intended for battlefield and limited strikes.[2] Battlefield and limited strikes are exemplified by attacks on facilities in remote forests, deeply buried facilities, and, the most classic example, a lone submarine in the middle of an ocean.[3] The explosive strength of nuclear weapons is primarily measured in kilotons.[4] Low-yield nuclear bombs measure anywhere from less than one kiloton to about fifteen kilotons.[5] In contrast, some nuclear weapons can be more than

1. *Catastrophic Harm*, INT'L CAMPAIGN TO ABOLISH NUCLEAR WEAPONS, https://www.icanw.org/catastrophic_harm [https://perma.cc/UZ52-KBBN] (last visited Dec. 6, 2020).

2. *See Tactical Nuclear Weapons*, BRITANNICA (last visited Nov. 23, 2020), https://www.britannica.com/technology/tactical-nuclear-weapon [https://perma.cc/9Z8M-RETQ] ("small nuclear warheads and delivery systems intended for use on the battlefield or for a limited strike"); *see also North Atlantic Treaty Organization*, DEFINITIONS OF NUCLEAR FORCES 1-24-25 (2007), https://www.nato.int/docu/glossary/eng-nuclear/eng-app3.pdf [https://perma.cc/8MC8-8B3Y] (explaining that Russia defines tactical nuclear weapons as those with a depth of employment "up to 300 km" and the United States recognizes tactical nuclear weapons as "nuclear forces designed for localized military missions") [hereinafter NATO Definitions]; Nikolai Sokov, *Tactical Nuclear Weapons*, NUCLEAR THREAT INITIATIVE, (Apr. 30, 2002), https://www.nti.org/analysis/articles/tactical-nuclear-weapons/ [https://perma.cc/X4A5-MWYM]; *see, e.g., The Davy Crockett*, BROOKINGS (July 9, 2008), https://web.archive.org/web/20080709011829/http://www.brookings.edu/projects/archive/nucweapons/davyc.aspx [https://perma.cc/SP25-P95Q] (demonstrating how tactical nuclear weapons operate by having limited ranges and limited yields). *But see* Hans Kristensen & Matt Korda, *Tactical Nuclear Weapons, 2019*, 75 BULLETIN OF THE ATOMIC SCIENTISTS 252, 254 (2019) ("Unlike other types of nuclear weapons and associated delivery systems, there is no universally-accepted definition for a 'tactical,' 'nonstrategic,' or 'theater' nuclear weapon. During the Cold War, such weapons were also referred to as 'battlefield' nuclear weapons.").

3. *See* Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. Rep. 381 (July 8) [hereinafter Nuclear Weapons Advisory Opinion] (J. Shahabudden, dissenting) (recognizing battlefield strikes as those such as against "a lone nuclear submarine at sea or against an isolated military target in the desert").

4. *See Thermonuclear Bomb*, BRITANNICA, (last visited Nov. 23, 2020), https://www.britannica.com/technology/thermonuclear-bomb#ref258692 [https://perma.cc/NL73-ZRZQ].

5. Brian Alexander & Alistair Millar, *Uncovered Nukes: An Introduction to Tactical Nuclear Weapons*, *in* TACTICAL NUCLEAR WEAPONS: EMERGENT THREATS IN AN EVOLVING SECURITY ENVIRONMENT, 3, 5 (Brian Alexander & Alistair Millar, eds., 2003); *see also* Ricky Zipp, *What Exactly Is A Low-Yield Nuclear Weapon*?, MEDILL NEWS SERVICE (Feb. 9, 2018), https://dc.medill.northwestern.edu/blog/2018/02/09/exactly-low-yield-nuclear-weapon/#sthash.PAfVMvMe.dpbs [https://perma.cc/7V2B-LWS7].

1,000 kilotons.[6] Conventional explosive weapons are generally non-nuclear and have blast strengths which pale in comparison to nuclear weapons.[7] While they are technically "weaker," the upper echelon of conventional weapons rivals the practical effects of tactical nuclear weapons.[8] While states can use low-yield nuclear weapons as strategic nuclear weapons, this discussion does not consider strategic nuclear weapons of any yield.[9] The term "tactical nuclear weapon" as used here refers to a low-yield nuclear weapon which is used for a battlefield or other limited strike.

Contemporary tactical nuclear weapons are considered low-yield while contemporary strategic nuclear weapons are considered high yield.[10] During World War II, the United States dropped the low-yield nuclear weapon "Little Boy" on Hiroshima, Japan.[11] The power of the blast was likely between ten and fifteen kilotons, though sources vary as to the exact tonnage of the explosion.[12] Little Boy was not a tactical weapon, however, because

6. *See* Caleb Larson, *B83: The U.S. Military's Most Dangerous Nuclear Weapon?*, NATIONAL INTEREST (Nov. 22, 2020), https://nationalinterest.org/blog/reboot/b83-us-militarys-most-dangerous-nuclear-weapon-173089 [https://perma.cc/VN5R-YVUC].

7. *See* Yasmin Tayag, *How Does the "Mother of All Bombs" Compare to a Nuclear Bomb?*, INVERSE (Apr. 13, 2017), https://www.inverse.com/article/30306-moab-mother-of-all-bombs-compare-nuclear-atomic-bomb-hiroshima-nagasaki#:~:text=The%20MOAB%2C%20which%20contains%20over%208%2C000%20pounds%20of,an%20explosion%20equivalent%20to%2011%20tons%20of%20TNT [https://perma.cc/VMB9-Y2SP]. The United States' strongest conventional weapon equates to eleven tons of TNT. *Id.*

8. *See infra* Section IV.B.

9. Strategic nuclear weapons are weapons that would not be used for battlefield strikes, they are long-distance weapons that are typically stronger than tactical weapons. *See* NATO Definitions, *supra* note 2 (stating that both the United States and Russia defined strategic nuclear weapons as those "with ranges over 5500 kilometers").

10. *See id.*; *see also* Jeff Schogol, *Why There's No Such Thing as 'Tactical' Nuclear Weapons,* TASK & PURPOSE (Sept. 19, 2020) https://taskandpurpose.com/analysis/no-tactical-nuclear-weapons/ [https://perma.cc/6MW9-WNSP] (discussing the nature of why tactical nuclear weapons would inevitably lead to nuclear escalation but uses the terms low-yield and tactical nuclear weapon interchangeably).

11. *Bombing of Hiroshima and Nagasaki*, HISTORY.COM (last updated Apr. 26, 2021), https://www.history.com/topics/world-war-ii/bombing-of-hiroshima-and-nagasaki#:~:text=Thick%20clouds%20over%20the%20primary%20target%2C%20the%20city,and%20was%20built%20to%20produce%20a%2022-kiloton%20blast [https://perma.cc/5U4Z-SPGF] (citing between twelve and fifteen kilotons).

12. Tyler Bamford, *The Most Fearsome Sight: The Atomic Bombing of Hiroshima*, THE NAT'L WWII MUSEUM: NEW ORLEANS (Aug. 6, 2020), https://www.nationalww2museum.org/war/articles/atomic-bomb-hiroshima [https://perma.cc/282Z-3H2W] (citing fifteen kilotons); *but see Bombing of Hiroshima and Nagasaki*, *supra* note 11 (citing between twelve and fifteen kilotons).

it did not operate as a limited strike against a military target.[13] Rather, it was used and directed at a civilian population, though some scholars disagree as to whether this was to end the war or to intimidate the Soviet Union.[14] Therefore, despite having a low yield, Little Boy was not a tactical nuclear weapon; it was a low-yield strategic nuclear weapon. No country has used tactical nuclear weapons, as defined here, in combat.[15] This example shows the nuance of yield and weapon use—strategic weapons can be low-yield and tactical could be high-yield. Typically, however, strategic are high-yield and tactical are low-yield. For the purpose of this Note, a tactical nuclear weapon is only considered low-yield and a strategic nuclear weapon is only considered high-yield.

This Note argues that there is no scenario in which the use of a tactical nuclear weapon will comply with the principles of the Law of Armed Conflict: discrimination, necessity, and proportionality. The Law of Armed Conflict is analogous to common law and relies on consulting multiple bodies of law to ascertain the "rules" of war.[16] Contemporary evidence reveals

13. *See* Rupert Wingfield-Hayes, *Hiroshima Bomb: Japan Marks 75 Years Since Nuclear Attack*, BBC NEWS (Aug. 6, 2020), https://www.bbc.com/news/world-asia-53660059 [https://perma.cc/6598-UCVN]; *see also* Gar Alperovitz, *Did America Have to Drop the Bomb? Not to End the War, But Truman Wanted to Intimidate Russia*, WASHINGTON Post (Aug. 4, 1985), https://www.washingtonpost.com/archive/opinions/1985/08/04/did-america-have-to-drop-the-bombnot-to-end-the-war-but-truman-wanted-to-intimidate-russia/46105dff-8594-4f6c-b6d7-ef1b6cb6530d/ [https://perma.cc/83GQ-F9DN] (arguing that the United States used the atomic bomb in a geopolitical strategic way, not as a battlefield weapon).

14. *See* Alperovitz, *supra* note 13; *see also* Ryan Browne & Scottie Andrew, *Why the US Dropped an Atomic Bomb on Hiroshima*, CNN (Aug. 6, 2020), https://www.cnn.com/2019/08/06/us/hiroshima-anniversary-explainer-trnd/index.html [https://perma.cc/9QX4-3AU2] (arguing that Truman used the bomb because he was hard pressed to do so to end the war as quickly as possible); DEP'T OF STATE, OFF. OF THE HISTORIAN, *Atomic Diplomacy* (last visited Nov. 27, 2020) https://history.state.gov/milestones/1945-1952/atomic [https://perma.cc/W6VE-6UYP]. American policy and military advisers argued that the nuclear bomb "was a means to a faster end to the Pacific conflict that would ensure fewer conventional war casualties. They did, however, consider the role that the bomb's impressive power could play in postwar U.S. relations with the Soviet Union." *Id.*

15. *Tactical Nuclear Weapons*, *supra* note 2.

16. DEP'T. OF DEF., LAW OF WAR MANUAL 7-12 (June 2015), https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf?ver=2016-12-13-172036-190 [https://perma.cc/QB5D-9VVV] (noting that this body of law relies on customary international law and does not reside in a single treaty or other agreement, as

some shortcomings of the International Court of Justice's ("ICJ") Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons ("ICJ Opinion")[17] as it relates to discussions of tactical nuclear weapons.[18] That opinion is arguably the most important piece of nuclear weapons law[19] but had a lackluster holding. The Court held that nuclear weapons, if used, would probably break the Law of Armed Conflict, but the Court could not definitively hold that use always would be illegal.[20] Therefore, the Court retained the status quo.[21] Research since the opinion[22] supports other dissenting opinions which largely agree that use of these tactical nuclear weapons would be illegal.[23] Therefore, the question of

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it is a complex, living doctrine subject to change as the nature of warfare evolves) [hereinafter "LAW OF WAR MANUAL"]; *see also* Jens Ohlin, *The Common Law of War*, 58 WM. & MARY L. REV. 493, 498 (2016) (discussing how the Law of Armed Conflict is not directly the same as US common law, but derives historic underlying principles from Western common law generally).

17. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 226.

18. *Id.* at 262, ¶ 94. The Court recognized "smaller, low yield, tactical nuclear weapons," which indicated that the Court was considering tactical and low-yield to be a reference to the same type of nuclear weapon. *Id.* The Court used the terms tactical and low-yield in only two other places. *Id.*

19. John Burroughs, *Looking Back: The 1996 Advisory Opinion of the International Court of Justice*, ARMS CONTROL ASS'N (July/Aug. 2016), https://www.armscontrol.org/ACT/2016_07/Features/Looking-Back-The-1996-Advisory-Opinion-of-the-International-Court-of-Justice [https://perma.cc/W6WU-9QNZ] ("The 1996 advisory opinion . . . was the culmination of a decades-long debate on the legality of nuclear weapons. In recent years, it has shaped how international law is invoked by the initiative focused on the humanitarian impacts of nuclear weapons use and served as a foundation for the nuclear disarmament cases brought by the Marshall Islands in the court.").

20. *Id.* ("The judges' votes on the conclusion were evenly split, 7-7; it was considered adopted due to the positive vote of Bedjaoui. Yet, the tie vote is misleading. In powerful dissents, three of the seven judges who voted against the conclusion maintained that the threat or use of nuclear weapons is unlawful in all circumstances.").

21. *See infra*, discussion at Section IV.D.

22. *See, e.g.,* Robert W. Nelson, *Lowering the Threshold: Nuclear Bunker Busters and Mininukes*, *in* TACTICAL NUCLEAR WEAPONS, supra note 22, at 68, 69; Kathryn Hansen, *How Would Nuclear War Affect the Climate?*, GLOBAL CLIMATE CHANGE (Feb. 22, 2011), https://climate.nasa.gov/news/483/how-would-nuclear-war-affect-the-climate/#:~:text=Instead%20of%20sulfate%20particles%2C%20like,in%20very%20different%20climate%20impacts.&text=That's%20because%20the%20particles%20differ,prevent%20from%20reaching%20the%20ground [https://perma.cc/K3JN-FTWD].

23. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 381 (Shahabuddeen, J., dissenting) (recognizing that no nuclear weapons are clean, and only clean nuclear weapons could be legal outside of use for self-defense); *id.* at 549 (J. Weeramantry, dissenting) (noting that the Court is incapable of delivering a broad ruling because there are so many variations of nuclear weapons, but that tactical nuclear weapons as presented

whether nuclear weapons could be legally used is answered here only in relation to tactical nuclear weapons, which cannot be legally used.[24] This does not mean that the mere possession of tactical nuclear weapons is illegal *per se*, but rather that their use is.[25]

Part II is an overview of the guiding nuclear weapons law and how international law has accepted the ICJ Opinion. Part III analyzes the ICJ Opinion, notably the failure to address strategic and tactical nuclear weapons as distinct entities, and other arguments around use of tactical nuclear weapons. Part IV presents research surrounding tactical nuclear weapons which shows that these weapons cannot abide by the Principles of the Law of Armed Conflict. Part IV further argues that tactical nuclear weapons produce indiscriminate effects in the form of radiation, are an unnecessary use of force that cause superfluous injury, and are a disproportionate response in any scenario. Stated differently, the tactical nuclear weapons of today could never be used on a battlefield in accordance with the accepted Principles of the Law of Armed Conflict, and any use of a tactical nuclear weapon would be a breach of international law.

## *II. THE LAW OF NUCLEAR WEAPONS*

Innovation in military technology since the Cold War has made weapons more deadly, more reliable, and their use more feasible.[26] Disarmament—the process of disarming states of their nuclear weapons—and nuclear weapon non-proliferation—the

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were not lawful because if "nuclear weapons are generally illegal, there could not be an exception for 'small weapons'"); *see generally id.* at 556 (Koroma, J., dissenting) (explaining that, in regard to low-yield rather than tactical weapons, the devastation in Hiroshima and Nagasaki was unfathomable and issues of radiation, including environmental degradation and civilian death, persisted for long after the explosion).

24. *Id.* at 228, ¶ 1 ("Is the threat or use of nuclear weapons in any circumstance permitted under international law?").

25. This is in line with what the court did in regards to deterrence. *Id.* at 254, ¶ 67 ("The Court does not intend to pronounce here upon the practice known as the 'policy of deterrence.'"); *see also Per Se Law and Legal Definition*, USLEGAL (last visited Nov. 23, 2020), https://definitions.uslegal.com/p/per-se/ [https://perma.cc/V4S3-4XQL] (stating that *per se* unlawful means unlawful in any circumstance).

26. *See* Brendan Thomas-Noone, *Tactical Nuclear Weapons in the Modern Nuclear Era*, LOWY INST. (Sept. 30, 2016), https://www.lowyinstitute.org/publications/tactical-nuclear-weapons-modern-nuclear-era [https://perma.cc/BH8X-A9AB] (discussing how tactical nuclear weapons today are "more precise and potentially more usable").

prevention of spreading nuclear weapons to non-nuclear states—are persistent hopes amid the looming threat of nuclear weapons.[27] In 1996, the ICJ evaluated this threat of nuclear destruction in its nuclear weapons advisory opinion ("ICJ Opinion").[28] The ICJ is colloquially referred to as "the World's Court," and its role is to settle disagreements between states.[29] At the request of states, the ICJ occasionally delivers advisory opinions on disagreements pursuant to Article 96 of the United Nations' Charter.[30] The ICJ Opinion has greatly impacted international nuclear weapons litigants and advocates,[31] and is considered here as the premier document regarding legality of use of nuclear weapons.

### *A. Background Principles*

The ICJ Opinion applied the Law of Armed Conflict to a contemporary dilemma.[32] The Law of Armed Conflict has a long history, but today is largely codified customary law.[33] Customary law derives from generally accepted principals of legality and binds all states to act in a certain way toward all states; this is different than treaty law which binds signatories to act in a specific way toward each other.[34] The 1949 Geneva Conventions, the 1954

27. *See, e.g.*, G.A. Res. 75/83, U.N. Doc. A/75/PV.37 (Dec. 7, 2020).

28. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 227-28.

29. *The Court,* INT'L CT. OF JUST. (last visited Oct. 15, 2021), https://www.icj-cij.org/en/court [https://perma.cc/64NW-FX3J].

30. *What Is an Advisory Opinion of the International Court of Justice (ICJ)?* UNITED NATIONS (last visited Oct. 15, 2021), https://ask.un.org/faq/208207 [https://perma.cc/W3XF-A577].

31. Pieter Bekker, *Advisory Opinions of the World Court on the Legality of Nuclear Weapons*, 1 ASIL INSIGHTS (1996) ("[T]hese advisory opinions of the World Court are of considerable significance to the development of the law of nuclear weapons and international organizations . . . the legal reasoning leading to these conclusions reflects the Court's authoritative views on important issues of international law"); *see also* Burroughs, *supra* note 19 ("[T]he advisory opinion remains an indispensable guide to the norms compelling nonuse of nuclear weapons and their universal elimination.").

32. Nuclear Weapons Advisory Opinion, supra note 3, at 226 ("law applicable in armed conflict").

33. *See* INT'L COMM. OF THE RED CROSS, THE LAW OF ARMED CONFLICT: BASIC KNOWLEDGE 8 (2002) [hereinafter ICRC BASIC KNOWLEDGE].

34. *Customary International Humanitarian Law: Questions & Answers, INT'L COMM. OF THE RED CROSS* (Aug. 15, 2005), https://www.icrc.org/en/doc/resources/documents/misc/customary-law-q-and-a-150805.htm [https://perma.cc/89EH-6A4Z].

Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict, and various other treaties, are written documents spelling out what is legal and illegal during war.[35] These treaties and other customary laws are the bedrock for arguments both for and against the use of tactical nuclear weapons, but today the ICJ Opinion is the foremost authority on the issue.[36]

The ICJ Opinion discussed both *jus ad bellum*, the law of aggression and the creation of war, and *jus in bello*, the law of regulating conduct during the course of warfighting.[37] This discussion of tactical nuclear weapons is squarely a *jus in bello* principle because it considers tactical nuclear weapons used on the battlefield as opponents wage war.[38] This Note assesses the principles of the Law of Armed Conflict in a state of war.[39] Like international law at large, the principles of discrimination, necessity, and proportionality are influenced by treaty and customary international law.[40] Nevertheless, it is crucial to

35. *See* ICRC BASIC KNOWLEDGE, *supra* note 33; *see also*, *1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict*, UNITED NATIONS EDUC., SCI. & CULTURAL ORG. (last visited Mar. 13, 2021), http://www.unesco.org/new/en/culture/themes/armed-conflict-and-heritage/convention-and-protocols/1954-hague-convention/ [https://perma.cc/7RAD-5MWP]; *The Geneva Conventions of 1949 and their Additional Protocols*, *INT'L COMM. OF THE RED CROSS* (Jan. 1, 2014), https://www.icrc.org/en/document/geneva-conventions-1949-additional-protocols [https://perma.cc/RC9R-Y4PU].

36. *See* Burroughs, *supra* note 19.

37. *See* INT'L COMM. OF THE RED CROSS, INTERNATIONAL HUMANITARIAN LAW: ANSWERS TO YOUR QUESTIONS 21 (2015); *see also* Nuclear Weapons Advisory Opinion, *supra* note 3, at 259-61, ¶ 86-89.

38. *See* MICHAEL WALZER, JUST & UNJUST WARS 21 (4th ed., 2006) (explaining *jus in bello* is a term to describe the "observance or violation of the customary and positive rules of engagement"); *see also* Matthew J. Aiesi & Amanda L. Minikus, *The U.S. Should Communicate in the Jus ad Bellum Lexicon to Strengthen Its Deterrence Posturing*, LAWFARE (June 25, 2020), https://www.lawfareblog.com/us-should-communicate-jus-ad-bellum-lexicon-strengthen-its-deterrence-posturing [https://perma.cc/E49J-6KAR] (noting that historic use of deterrence has been undermined by United States' failure to engage the lexicon of *jus ad bellum*).

39. This Note does not make any claims to warfighting that amounts to an act of aggression, which would constitute a *jus ad bellum* dilemma. Rather, this Note assesses tactical nuclear weapons as removed from notions of aggression. It should be noted, however, that escalation is not the same as aggression. Escalation is a product of war's conduct, while aggression is the triggering effect to begin a war. WALZER, *supra* note 38, at 21 ("[I]t is perfectly possible for a just war to be fought unjustly and for an unjust war to be fought in strict accordance with the rules.").

40. *See* CHARLES J. MOXLEY, NUCLEAR WEAPONS AND INTERNATIONAL LAW IN THE POST COLD WAR WORLD, (Austin & Winfield eds., forthcoming 2021) (manuscript at 45) (on file with author).

recognize that although the ICJ Opinion was non-binding, the Court still had the legitimacy to discuss the legality of nuclear weapons,[41] and that its discussion had a lasting impact.[42]

Breaking the Law of Armed Conflict would have a number of consequences for states. On the one hand, they may open themselves up to reprisals. Reprisals are illegal acts that are permitted when done against a state to prevent it from continuing to act in an illegal manner.[43] For example, if the Soviet Union were to illegally use a nuclear weapon on New York, the United States would likely be justified in using a nuclear weapon on Moscow with no legal consequence. States may also have to pay reparations for breaking the Law of Armed Conflict.[44]

### *B. The Calls for Control*

At the request of some states that viewed the use or threat of nuclear weapons as illegal, the ICJ agreed to deliver an advisory opinion on the matter in 1996.[45] The Court, however, held that it did not have sufficient facts to conclude that use of nuclear weapons would violate the Law of Armed Conflict in every scenario.[46] The holding did not distinguish tactical from strategic

41. Nuclear Weapons Advisory Opinion, *supra* note 3, at 235-36 (noting that it can use article 65, paragraph 1 of the Statute that the United Nations, which created the ICJ, to deliver advisory opinions when requested by member states).

42. *See* Burroughs, *supra* note 19.

43. *See Reprisal,* JRANK, https://law.jrank.org/pages/9791/Reprisal.html#:~:text=In%20terms%20of%20INTERNATIONAL%20LAW,intended%20to%20satisfy%20a%20claim [https://perma.cc/B236-HGAT] (last visited Oct. 15, 2021) ("[T]here is a fine distinction between a 'lawful reprisal,' and an act of revenge or retaliation, which are always illegal under international law. Although reprisals are acts that normally would be considered illegal, circumstances can boost them into the realm of the legitimate. To be considered legitimate, reprisals must be taken in response to prior illegal attacks.").

44. *Frequently Asked Questions on the rules of war*, INT'L COMM. OF THE RED CROSS (Oct. 19, 2016), https://www.icrc.org/en/document/ihl-rules-of-war-FAQ-Geneva-Conventions#:~:text=What%20happens%20if%20you%20break,of%20IHL%20are%20war%20crimes.&text=War%20crimes%20can%20be%20investigated,circumstances%2C%20by%20an%20international%20court [https://perma.cc/93PY-WZ66].

45. Nuclear Weapons Advisory Opinion, supra note 3, at 226 (The Court granted standing because the United Nations General Assembly requested it give an advisory opinion).

46. *Id.* at 263, ¶ 95. The Court did not have enough facts "to enable it to conclude with certainty that the use of nuclear weapons would necessarily be at variance with the principles and rules of law applicable in armed conflict in" every scenario.

nuclear weapons. Such a lack of distinction forms the basis of this Note.[47]

Since delivered, the ICJ Opinion has not received much, if any, affirmative praise.[48] The ICJ Opinion favored the nuclear weapons states, notably the United States, the United Kingdom, France, and Russia, over everyone else.[49] Immediately after the Court delivered its opinion, the nuclear weapons states neither boasted nor celebrated, but rather noted that business would carry on as usual.[50] In contrast, non-nuclear states believed "the effects of nuclear explosions are inherently uncontrollable and indiscriminate and [*sic*.] the use of such weapons is therefore unlawful in all circumstances."[51] In recent years, even some nuclear states have called for disarmament, but none have done so, and the ICJ has not held any nuclear state accountable for failing to actually disarm.[52]

The current international law around tactical nuclear weapons lawfully allows their use because the nuclear countries do not consider their use *per se* illegal.[53] However, this does not

47. The court used the terms low-yield and tactical nuclear weapons as interchangeable, and used the terms to distinguish tactical from strategic weapons, but then failed to deliver a rule reflecting this distinction. *Id.* at 262, ¶ 94 ("The Court would observe that none of the States advocating the legality of the use of nuclear weapons under certain circumstances, including the 'clean' use of smaller, low yield, tactical nuclear weapons, has indicated what, supposing such limited use were feasible, would be the precise circumstances justifying such use; nor whether such limited use would not tend to escalate into the all-out use of high yield nuclear weapons. This being so, the Court does not consider that it has a sufficient basis for a determination on the validity of this view.").

48. *See* Burroughs, *supra* note 19.

49. *See id.* (finding even those non-nuclear states that were so culturally, politically, and historically tied to nuclear states, such as Australia to the United Kingdom, vehemently opposed use of nuclear weapons); *see also* Kelsey Davenport et al., *Nuclear Weapons: Who Has What at a Glance*, ARMS CONTROL ASSOCIATION (Oct. 2021) https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat [https://perma.cc/8YLV-GBLT] (discussing the amount of nuclear weapons known to be owned by each nuclear state).

50. *See* Burroughs, *supra* note 19.

51. *See id.*

52. Philip Bump, *Obama Calls for End to Nuclear Weapons, but U.S. Disarmament is Slowest Since 1980*, WASH. POST (May 27, 2016), https://www.washingtonpost.com./news/the-fix/wp/2016/05/27/obama-calls-for-end-to-nuclear-weapons-but-u-s-disarmament-is-slowest-since-1980/ [https://perma.cc/7792-BCAN].

53. Nuclear Weapons Advisory Opinion, *supra* note 3, at 266 (holding that use would generally violate the Law of Armed Conflict, but deterrence and self-defense are legal state policies and practices so the Court could not deliver a *per se* rule on legality of use); *see*

preclude an interpretation that use is illegal. The Court also emphasized that it would not hold that simply having, as opposed to actually using, nuclear weapons was illegal because that is a policy issue under deterrence and the ICJ would not comment on that policy issue.[54] The operative holding, however, was that nuclear weapons cannot be *per se* illegal because self-defense may merit a legal use even though other uses would "generally be contrary to the rules of international law applicable in armed conflict."[55] Strategists in charge of tactical nuclear weapons intend for their use only in[56] armed conflict,[57] which makes the Court's failure to distinguish tactical from strategic nuclear weapons problematic.

The Principles of the Law of Armed Conflict addressed here are discrimination, necessity, and proportionality. Defining these terms can be difficult as many publications and organizations have different words or phrases that can alter the meaning of each principle.[58] Despite no clear definition for each principle, the ICJ recognized that there is a common theme among the principles to protect civilians subject to, but not party to, warfighting.[59] It must be noted that the sentiment of protecting civilians overrides any contrary plain language used in defining such terms.

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*also* INT'L AND OPERATIONAL L. DEP'T, LAW OF ARMED CONFLICT DESKBOOK 138 (5th ed. 2015) (noting that despite international agreements recognizing uncontainable weapons as indiscriminate, the United States follows a more nuanced view of what it considers weapons with effects that cannot be limited so as to "permit weapons such as cluster munitions and nuclear arms") [hereinafter "ARMED CONFLICT DESKBOOK"].

54. Nuclear Weapons Advisory Opinion, *supra* note 3, at 254, ¶ 67 ("[T]he Court does not intend to pronounce here upon the practice known as the 'policy of deterrence.'").

55. Nuclear Weapons Advisory Opinion, *supra* note 3, at 257-65, ¶ 105.

56. This phrase of "in" is a bit peculiar but seems to mean "during," which would create a more fluid reading of the holding. *See* Nuclear Weapons Advisory Opinion, *surpa* note 3, at 266, ¶ 105.

57. *See, e.g.,* Davenport et al., *supra* note 49 (explaining that these weapons are designed in response to the growing power over conventional weapons, such as how "Pakistan has lowered the threshold for nuclear weapons use by developing tactical nuclear weapons capabilities to counter perceived Indian conventional military threats").

58. *See* ICRC BASIC KNOWLEDGE, *supra* note 33, at 12-13 (2002); *see also* Travis Normand & Jessica Poarch, *4 Basic Principles*, THE L. OF ARMED CONFLICT (last visited Mar. 12, 2021), https://loacblog.com/loac-basics/4-basic-principles/ [https://perma.cc/7CYM-J8JD]; *infra* discussion Part IV.

59. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 257, ¶ 78.

## *III. AN AMBIGUOUS HOLDING*

Without stating the words "*per se,*" the ICJ eventually voted and ruled that nuclear weapons are not illegal because states may legally use them in self-defense. However, the Court held that their use would otherwise generally violate the principles of the Law of Armed Conflict.[60] The Court left open whether a clean tactical nuclear weapon could ever be created, and did not directly rule on the *per se* legality of tactical nuclear weapons as distinct from strategic nuclear weapons due to inconclusive facts.[61] The issue was whether a state could ever create and use a "clean" nuclear weapon.[62] The Court voted on seven issues but was divided over the issue of legal threat or use of nuclear weapons.[63] Three judges dissented on the grounds that they believed all nuclear weapons should be *per se* unlawful.[64]

### *A. The ICJ Ruled on Use of Tactical Nuclear Weapons Pari Passu with Strategic Weapons*

This Note addresses the fact that the ICJ did not rule on strategic and tactical nuclear weapons as distinct entities.[65] The consideration of collateral effects and risk analysis are central to

60. Nuclear Weapons Advisory Opinion, *supra* note 3, at 266, ¶ 105 ("[T]he threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict . . . . However, in view of the current state of international law, and of the elements of fact at its disposal, the Court cannot conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defense, in which the very survival of a State would be at stake.").

61. *Id.* at 262 (arguing that the limitation of a "clean" tactical nuclear weapon was not a real possibility at the time).

62. *See infra* Section III.B.

63. Nuclear Weapons Advisory Opinion, *supra* note 3, at 265-66. The Court took votes on seven issues, four were unanimous, one vote was thirteen to one, another was eleven to three, and the issue of legal threat or use was a seven to seven split with the President's vote counting as decisive to argue that use or threat of a nuclear weapon is not *per se* illegal. *Id.*

64. Nuclear Weapons Advisory Opinion, *supra* note 3, at 381 (Shahabuddeen, J., dissenting); *id.* at 553-54 (Weeramantry, J., dissenting); *id.* at 581 (Koroma, J., dissenting) ("[T]hat in view of the established facts of the use of such weapons, it is inconceivable that there is any circumstance in which their use would not violate the principles and rules of international law applicable in armed conflict and, in particular, the principles and rules of humanitarian law.").

65. *See id.* at 546-50 (Weeramantry, J., dissenting) (arguing that the Court should have distinguished more between tactical and strategic weapons because the Court heard arguments that relied on this distinction).

discussions around the use of a tactical nuclear weapon.[66] Some scholars have argued that the court's language signals that there is likely no scenario where use of a tactical nuclear weapon would be legal,[67] but this Note goes further to argue that contemporary evidence suggests use of a tactical nuclear weapon is *per se* illegal.[68] The legal conclusions in the ICJ Opinion are explored below in light of new facts discovered since the opinion was rendered,[69] such as facts discovered through more sophisticated modeling of the effects of tactical nuclear weapons. Analyzing the ICJ Opinion in light of these new facts is necessary given that it is the leading legal document regarding use of nuclear weapons.[70]

### *B. Scholars and Government Officials Recognize Tactical and Strategic Nuclear Weapons as Distinct Entities*

Technology has advanced at an exponential rate since the Court rendered its opinion. The ICJ felt that the evidence presented to the Court lacked necessary components and recognized that no state had been able to develop a clean tactical nuclear weapon.[71] A clean nuclear weapon is one that does not produce radiation.[72] The

66. *See infra* Part IV.

67. INT'L L. & POL'Y INST., NUCLEAR WEAPONS UNDER INTERNATIONAL LAW: AN OVERVIEW 7 (Oct. 2014), https://www.geneva-academy.ch/joomlatools-files/docman-files/Nuclear%20Weapons%20Under%20International%20Law.pdf [https://perma.cc/8ZWW-7U45]; *see also* Nuclear Weapons Advisory Opinion, *supra* note 3, at 266, ¶ 105 ("[U]se of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of humanitarian law."); *see generally* Nelson, *supra* note 22 (arguing not for *per se* illegality, but producing evidence that supports the notion that use of a tactical nuclear weapon would be illegal).

68. *See Per Se Law and Legal Definition*, *supra* note 25.

69. These new facts and the ICJ's legal conclusions will be considered only for tactical nuclear weapons. Any mention of strategic nuclear weapons is only for the sake of further distinguishing or clarifying tactical nuclear weapons or the effects of their use.

70. *See* Burroughs, *supra* note 19.

71. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 262-63.

72. A clean tactical nuclear weapon is one in which the blast and heat are the only effects, one where radiation is not disseminated or created in any way. *See id.* at 262; *see also* William Burr, "*Clean" Nukes and the Ecology of Nuclear War*, NAT'L SEC. ARCHIVE (Aug. 30, 2017), https://nsarchive.gwu.edu/briefing-book/nuclear-vault/2017-08-30/clean-nukes-ecology-nuclear-war#:~:text=%E2%80%9CClean%E2%80%9D%20weapons%20were%20designed%20to%20ensure%20that%20most,%E2%80%9Csuper-clean%E2%80%9D%20weapons%20were%20all-fusion%20devices%20that%20proved%20elusive [https://perma.cc/42GT-RZMH].

Court did not prescribe a *per se* rule in its opinion because it believed a clean tactical nuclear weapon could exist in the future, rendering tactical nuclear weapon usage more feasible.[73] Since the ruling, scholars continued to argue that clean nuclear weapons are science fiction.[74]

Even before the ruling, the United States prohibited development on a weapon below five kilotons so as to not blur the line between nuclear and conventional weapons,[75] which only reinforced the notion that developing a clean tactical nuclear weapon is impossible. Additionally, the Court noted that even if a clean tactical nuclear weapon did exist, the Court could not determine whether use of a tactical nuclear weapon would immediately escalate conflict.[76] Therefore, recognizing the unique type of escalation from, and the inherent dirtiness[77] of, tactical nuclear weapons, military strategists have made it clear that tactical nuclear weapons are distinct from strategic weapons.[78] Had a clean tactical nuclear weapon existed, however, the Court may have been able to assess it as more of a conventional weapon, and the Court could still assess strategic nuclear weapons as they relate to self-defense.[79] As for what state entities have actually created, tactical nuclear weapons are distinct from strategic

73. *See* MOXLEY, *supra* note 40 (manuscript at 392-93). President Bedjaoui argued that nuclear weapons are not at the point of being "clean weapons" and these "dirty nuclear weapons" would be inherently indiscriminate, and, thus, illegal. So, the Court based its reasoning of legality on the idea that there can be, in the future, a tactical nuclear weapon that could possibly be a "clean nuclear weapons" and, therefore, the "dirty nuclear weapons" of today that should be illegal are not. *Id.*

74. *See generally* Nelson, *supra* note 22; *see also* Burr, *supra* note 72.

75. *See* Nelson, *supra* note 22, at 69. This reinforces the idea that tactical and strategic nuclear weapons are distinct because use of strategic nuclear weapons would never be on par with conventional weapons, but tactical nuclear weapons are intended to be used like conventional non-nuclear weapons. *Id.*

76. Nuclear Weapons Advisory Opinion, *supra* note 3, at 262, ¶ 94 (stating it lacked "a sufficient basis for a determination on the validity" of escalation).

77. Nuclear weapons are referred to as "dirty" because of the spread and effects of radiation. *See* Burr, *supra* note 72.

78. *See* AMY F. WOOLF, CONG. RSCH. SERV., RL32572, NONSTRATEGIC NUCLEAR WEAPONS 8-10 (2020) (describing the many methods of distinguishing tactical from strategic nuclear weapons); *see also infra* Part IV (arguing that it is necessary to consider the possibility of escalation and psychical occurrences, like radiation dispersion or blast effects, when using a tactical nuclear weapon, but these considerations are different than strategic nuclear weapons which are defense orientated).

79. *See* Nuclear Weapons Advisory Opinion, supra note 3, at 266, ¶ 105.

weapons because of factors such as explosive size, proposed use, and delivery vehicles.[80]

Many scholars and politicians advocating for tactical nuclear weapons do so for the sake of deterrence,[81] which is an argument outside the scope of this Note. One argument for use of a tactical nuclear weapon is in response to another's use of a tactical nuclear weapon.[82] This argument does not make responsive use "legal" insofar as it is a "reprisal,"[83] especially when considering that these wrongs could lead to the death of hundreds of millions of people.[84] Reprisals are, essentially, illegal acts that are undertaken in response to a previously committed illegal act and are, therefore, excused and not treated as "illegal."[85]

80. *See* WOOLF, *supra* note 78; *see also* Vipin Narang, *The Discrimination Problem: Why Putting Low-Yield Nuclear Weapons on Submarines is so Dangerous*, WAR ON THE ROCKS (Feb. 8, 2018), https://warontherocks.com/2018/02/discrimination-problem-putting-low-yield-nuclear-weapons-submarines-dangerous/ [https://perma.cc/2VRM-AK4K] (stating the Trump administration advocated putting tactical warheads on one delivery system which blurred the line between tactical, low-yield and strategic, high-yield nuclear weapons).

81. *See generally* WOOLF, *supra* note 78.

82. Daniel Cebul, *Nonstrategic Nukes: What Are They Good For?*, DEFENSENEWS (Feb. 26, 2018) https://www.defensenews.com/space/2018/02/26/nonstrategic-nukes-what-are-they-good-for/ [https://perma.cc/VK74-ECXM].

83. *Reprisals*, INT'L COMM. OF THE RED CROSS (last visited Mar. 13, 2021), https://casebook.icrc.org/glossary/reprisals#:~:text=Reprisals%20are%20only%20allowed%20under,reprisals%20in%20international%20humanitarian%20law [https://perma.cc/GAQ4-VM9L] ("A 'reprisal' is a breach of international humanitarian law, which would otherwise be unlawful but in exceptional cases is considered lawful as an enforcement measure in response to a previous breach of international humanitarian law by the enemy, with the purpose of terminating the enemy's violation. Thus, reprisals are intended to put pressure on the enemy in order to obtain the enemy's compliance with international humanitarian law. Reprisals are only allowed under very strict conditions and there is a trend towards outlawing reprisals in international humanitarian law.") [hereinafter "*Reprisals*"].

84. *See* Ellen Ioanes & Dave Mosher, *A Terrifying New Animation Shows How 1 'Tactical' Nuclear Weapon Could Trigger a US-Russia War that Kills 34 Million People in 5 Hours*, BUS. INSIDER (Jan. 23, 2020), https://www.businessinsider.com/tactical-nuclear-weapons-escalation-us-russia-war-animated-strike-map-2019-9 [https://perma.cc/KJ89-MLKS] (noting that one reading of a tactical nuclear weapon launch, even if incorrect, could lead to retaliatory strikes resulting in massive worldwide death tolls).

85. *See Reprisals*, *supra* note 83.

### *C. Interpretations of the Opinion*

Scholars have taken a number of approaches to interpret the Opinion's rather ambiguous holding.[86] The Court ruled by a no majority 7-7 vote, the decision that use of nuclear weapons is not always illegal was a tie.[87] The tie was only broken in favor of the judges on the "legal" side because, in the event of a tie, the President of the ICJ's vote was the tie breaker.[88] Some scholars, especially disarmament advocates, relied on the Court's ruling to advocate for greater adherence to good faith negotiations for disarmament.[89] Other scholars ignored the plain language of the Opinion and looked at the subtext—notably, that this was an attempt to limit the nuclear countries' right to bear arms.[90] Others argued that the Court may not have even had the authority to answer the question, further supporting the idea that nuclear weapons are political in nature.[91] Regardless of whether scholars

86. There were several ambiguous discussions in the opinion, such as "use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict . . . [h]owever . . . the Court cannot conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defence." Nuclear Weapons Advisory Opinion, *supra* note 3, at 266, ¶105; *see, e.g.,* Robert Turner, *Nuclear Weapons and the World Court: The ICJ's Advisory Opinion and Its Significance for U.S. Strategic Doctrine,* 72 INT. L. STUDS. 309, 320-22 (arguing that the court's language of self-defense is ambiguous because it blurs the world's nations' right to collective self-defense).

87. *See* Bekker, *supra* note 31 (recognizing that when a ruling is a tied vote, as occurred in the Opinion, the President's vote is determinative for which side wins). In the nuclear weapons advisory opinion, seven judges felt that all nuclear weapons were *per se* illegal, and seven felt that the opposite was true; the President's vote, that the opposite was true, thus ruled the day. *Id.*

88. *Id.*

89. *See* Burroughs, *supra* note 19 (noting that "[a]ll judges voted for the resulting formal conclusion: 'There exists an obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control'").

90. Turner, *supra* note 86, at 313 ("T]hus, the only real question to be addressed was not whether the threat or use of nuclear weapons was ever lawful, but whether international law prohibited a State in possession of nuclear weapons from using them, or threatening to use them, under any conceivable circumstances in a defensive response to armed international aggression.")

91. *See* Stefaan Smis & Kim Van der Borght, *The Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons*, 27 GA. J. INT'L & COMP. L. 345, 350-51 (1999) (recognizing that many scholars who opposed the opinion believed that this was not a legal question ripe for the Court to answer). United Nations' Charter Article 96 requires that a question for the Court be legal and not political, and many adversaries saw the question of use as inherently political, but Smis and Van der Borght do not necessarily take that position themselves. *Id.* at 351.

supported the ICJ Opinion, opposed the opinion, or were uncomfortable with the amount of "grey area," most recognized that it was an exceptionally rare and important ruling.[92] Nuclear weapons policymakers and litigators have used the ruling to advocate both for and against the use of nuclear weapons.[93]

## *IV. ANALYSIS OF USE AS IT WOULD RELATE TO THE LAW OF ARMED CONFLICT*

This Part will explore three principles of the Law of Armed Conflict: discrimination, necessity, and proportionality, insofar as they relate to the use of a tactical nuclear weapon.[94] Illegal use of any weapon constitutes a breach of any of these principles.[95] The ICJ's recognition that use of a nuclear weapon would generally constitute an illegal act was an astute and correct application of the facts of nuclear weapons to the legal principles.[96] Based on research and developments following the opinion, if the ICJ revisited the question of legal use of nuclear weapons, it should rule that tactical nuclear weapons are *per se* illegal because there

92. *See* Liz Heffernan, *The Nuclear Weapons Opinions: Reflections on the Advisory Procedure of the International Court of Justice*, 28 STETSON L. REV. 133, 134 ("[T]his was the first occasion on which the ICJ directly addressed the fundamental issue of the status of nuclear weapons under international law.").

93. *See* Burroughs, *supra* note 19 (discussing how countries litigate nuclear weapons controls).

94. There are many principles of the Law of Armed Conflict, but these three are the most commonly recognized as the major principles. *See* MOXLEY, *supra* note 40, at 24; *see also* Brian L. Bengs, *Legal Constraints Upon the Use of a Tactical Nuclear Weapon Against the Natanz Nuclear Facility in Iran*, 40 GEO. WASH. INT'L L. REV. 323 (2008).

95. *See* Joanne Lu, *The 'Rules of War' are Being Broken. What Exactly are They?,* NPR (June 28, 2018), https://www.npr.org/sections/goatsandsoda/2018/06/28/621112394/the-rules-of-war-are-being-broken-what-exactly-are-they [https://perma.cc/WAG3-EY2A] (discussing what it looks like when countries act illegally during the course of war, such as noting that "[i]f the expected 'incidental civilian damage' of an attack is 'excessive' and 'disproportionate' to the anticipated military gain, then the attack legally cannot be carried out").

96. The Court did not prescribe illegal *per* se because use in self-defense in which the very survival of the state is at stake would not be subject to the principles of the Law of Armed Conflict. Nuclear Weapons Advisory Opinion, *supra* note 3, at 262-63, ¶ 95 ("[T]he use of such weapons in fact seems scarcely reconcilable with respect for such requirements. Nevertheless, the Court considers that it does not have sufficient elements to enable it to conclude with certainty that the use of nuclear weapons would necessarily be at variance with the principles and rules of law applicable in armed conflict in any circumstance.").

is no factual scenario in which they conform to the principles of the Law of Armed Conflict, particularly in light of the unavoidable risks associated with radiation.[97]

### *A. Discrimination*

The United States believes the principle of discrimination relies on the notion that civilians and their property cannot be targeted as military objectives.[98] Every branch of the US military follows this seemingly objective standard,[99] but it poses a variety of subjective questions.[100] The statement merely protects citizens from being directly targeted but permits collateral damage against non-targeted civilians.[101] The collateral damage must not be "foreseeably excessive in light of the anticipated military advantage to be gained."[102] Thus, the seemingly objective principle is actually subjective in practice and relies on a variety of tests and risk analyses to determine whether a strike can properly discriminate.[103] Under this subjective standard, tactical nuclear

97. *See* ALEXANDER & MILLAR, *supra* note 5; *see also* MOXLEY, *supra* note 40 (manuscript at 250-51) ("McNeill's language–'precisely engaging discrete military objectives'–seems to suggest that the United States can control the radioactive fallout from 'modern delivery systems' or *that such effects*, in the United States' view, *are not relevant to the analysis*.") (citing US DEP'T OF STATE, WRITTEN STATEMENT OF THE GOVERNMENT OF THE UNITED STATES OF AMERICA at 23 (June 20, 1995)).

98. U.S. DEP'T OF THE NAVY, THE COMMANDER'S HANDBOOK ON THE LAW OF NAVAL OPERATIONS § 9.1.2 (2017) (setting out law applicable to the navy, marines, and the coast guard) [hereinafter NAVAL HANDBOOK]; *but see* Nuclear Weapons Advisory Opinion, *supra* note 3, at 257 ("[On the] distinction between combatants and non-combatants; States must never make civilians the object of attack and must consequently never use weapons that are incapable of distinguishing between civilian and military targets.").

99. *See* CURTIS E. LEMAY CTR. FOR DOCTRINE DEV. & EDUC., BASIC PRINCIPLES OF THE LAW OF WAR AND THEIR TARGETING IMPLICATIONS 90 (Mar. 15, 2019); US DEP'T OF THE ARMY, ADP 3-0 OPERATIONS 3-56 (July 31, 2019) [hereinafter US OPERATIONS]; NAVAL HANDBOOK, *supra* note 98, at § 9.1.2; US DEP'T OF THE ARMY SPACE FORCE, FM 3-14 ARMY SPACE OPERATIONS, 1-18 (Oct. 2019).

100. The claim is to protect civilians and defeat combatants, but it is much more complicated when considering the idea that some civilians can be targeted if they are sufficiently a part of the war-fighting process, such as factory workers.

101. *See* NAVAL HANDBOOK, *supra* note 98, at § 9.1.2.

102. *Id.* This rule is similar to that of proportionality but is different because discrimination is based on anticipating, or failing to anticipate, civilian casualty, whereas proportionality knows civilian casualty will occur but questions whether than casualty is justified by the military advantage gained. *Id.; infra* Section IV.B.

103. *See* ARMED CONFLICT DESKBOOK, *supra* note 53, at 142-47 (discussing how the United States engages a case-by-case analysis for whether a strike is proportional); *see also*

weapons cannot discriminate due to their unique effects of radiation.

### 1. The Discrimination Standards

The ICJ Opinion on legality of use was a split decision. President Bedjaoui, President of the ICJ when it rendered the opinion, was the decisive vote against *per se* illegality, but even he had serious reservations about legality.[104] He recognized both that nuclear weapons have lasting negative effects on the environment and the right to life, and that no dirty nuclear weapon would ever be able to discriminate between combatants and civilians.[105] Tactical nuclear weapons' dirtiness makes their effects uncontrollable and their use illegal, while clean nuclear weapons remain a fantasy.[106]

The United States' conception of discrimination argued before the Court was too bound to the technological inferiorities of the past.[107] Some branches of the military still follow that antiquated definition[108] which was based on weapons of possibility, exemplified by Japanese balloons loaded with bombs sent adrift

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LAW OF WAR MANUAL, supra note 16, at 61, ¶ 2.4.1.2 ("[U]nder the law of war, judgments of proportionality often involve difficult and subjective comparisons.").

104. *See* SHANE DARCY, JUDGES, LAW AND WAR: THE JUDICIAL DEVELOPMENT OF INTERNATIONAL HUMANITARIAN LAW 195 (James Crawford & John S. Bell eds., 2014).

105. Nuclear Weapons Advisory Opinion, *supra* note 3, at 272, ¶ 20.

106. *See* James L. Denton, The Third Nuclear Age: How I Learned to Start Worrying About the Clean Bomb (Feb. 13, 2013) (Research Report Submitted to the Faculty, Air University) (on file with United States Defense Technical Information Center) ("This paper does not answer whether the fusion technology is possible and assumes it as an inevitable technological advancement. Instead, this study predicts a world in which low yield, clean fusion weapons exist and considers their implications."); *see also Neutron Bomb*, BRITANNICA, (last visited Mar. 20, 2021), https://www.britannica.com/technology/neutron-bomb [https://perma.cc/6X45-7QWH] (discussing a "clean" nuclear bomb that failed to garner mass production but was proposed to use highly concentrated radiation to kill humans without damaging property).

107. *See* Letter of the United States at 23, Legality of the Threat or Use of Nuclear Weapons, International Court of Justice Advisory Opinion of 8 July 1996 (the United States in its letter for the court argued that "since nuclear weapons can be directed at a military objective, they can be used in a discriminate manner and are not inherently indiscriminate").

108. US OPERATIONS, *supra* note 99, at 3-56 (focusing on targeting by requiring that armed forces must distinguish between armed forces and civilian populations but makes no mention of limiting effects); *but see* NAVAL HANDBOOK, *supra* note 98, at § 5.3.4 (some weapons are illegally indiscriminate if "the effects of which cannot be limited as required by the Law of Armed Conflict").

into wind currents blowing toward the United States' west coast during World War II.[109] The core of the rule of discrimination, however, rests on the idea that civilians will have a general protection against the direct effects of hostilities.[110]

The civilian and military technology of today is immediate and extremely precise.[111] Missiles can hit exact targets in a matter of minutes.[112] Hence, the question that Judge Higgins, who dissented in the opinion, wrestled with—whether the determinate factor for a discrimination analysis is missile capabilities or missile effects[113]—seems resolved by contemporary technological innovation. Missile targeting is more reliable now, so there must be greater credence for the effects of tactical nuclear strikes, such as the uncontrollable spread of radiation, which cannot be targeted toward anyone.[114] The uncertainty of radiation dispersion is greater than the uncertainty of a missile missing its target. Humanity and the protection of life demand that effects, not targeting, should be the major factor for considering discrimination of tactical nuclear weapons.

### *2. Tactical Nuclear Weapons Cannot Discriminate*

Radiation dispersion is integral to arguing that tactical nuclear weapons are *per se* illegal on the grounds that they are

109. *See* NAVAL HANDBOOK, *supra* note 98, at § 9.1.2 ("[W]eapons that are incapable of being directed at a military objective are forbidden as being indiscriminate in their effect. Drifting armed contact mines and long-range unguided missiles (such as the German V-1 and V-2 rockets of World War II) fall into this category.").

110. Direct effects in this context means things like collateral damage and other proximate causes, but should exclude things like mass famine. *See* Jean-François Quéguiner, *The Principle of Distinction: Beyond an Obligation of Customary International Humanitarian Law*, *in* THE LEGITIMATE USE OF MILITARY FORCE 161, 161 (Hensel ed., 2008); *see also* Nuclear Weapons Advisory Opinion, *supra* note 3, at 262, ¶ 95 (discussing the discrimination and agreed with states advocating illegality on the grounds that the unique characteristics of nuclear weapons, notably radiation, show that "the use of such weapons in fact seems scarcely reconcilable with respect for" discrimination).

111. *See, e.g., Iran's attack on Iraq shows how precise missiles have become***,** ECONOMIST (Jan. 18, 2020), https://www.economist.com/science-and-technology/2020/01/16/irans-attack-on-iraq-shows-how-precise-missiles-have-become [https://perma.cc/UR7T-TUF6].

112. *Id.*

113. MOXLEY, *supra* note 40 (manuscript at 392-96).

114. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 366-67, ¶ 24 (Higgins, J., dissenting) ("[I]t may be concluded that a weapon will be unlawful *per se* if it is incapable of being targeted at a military objective only, even if collateral harm occurs.").

indiscriminate.[115] The ICJ did not directly address the issue of weather, such as wind and oceanic storms, but did note the importance of environmental protection.[116] This may be attributable to the fact that the models studying the environmental effects of nuclear war available to the parties in the ICJ Opinion were limited.[117] The technology and modules studying the effects of nuclear weapons today are much more sophisticated than those with which the ICJ worked. The National Research Council's ("NRC") comprehensive review of the effects of low-yield earth-penetrating nuclear weapons, which are designed to contain radiation underground, forms the basis of this assessment of discrimination.[118] The bulk of this analysis recognizes radiation dispersion as inherently indiscriminate and also notes the unique effect of extreme shock waves that disseminate from a tactical nuclear blast which can rupture the eardrums and lungs of civilians in surrounding areas.[119]

Consider a target thirteen kilometers from the nearest town and sixty kilometers from the nearest city. The NRC believes that a ten kiloton bomb, targeted at an underground chemical warfare facility, penetrating three meters of earth would kill roughly one thousand people on average.[120] This figure, however, is not indicative of the total range of possible casualties[121] because earth-penetrating weapons with explosive strength lower than three hundred kilotons kill more people, notably civilians, by fallout than by initial blast.[122] So, any tactical nuclear weapon used as an earth penetrating weapon will be deadly to civilians, not merely because of the blast, but due to both fallout damage and radiation as well.

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115. *See id.* (recognizing a significant overlap with other principles, Judge Higgins determined that proportionality largely relied on targeting without regard to collateral damages to non-targeted people and places, but "[t]o the extent that a specific nuclear weapon would be incapable of this distinction, its use would be unlawful").

116. *Id.* at 241, ¶ 27.

117. Hansen, *supra* note 22. There is a noticeable lack of discussion in the ICJ Opinion of the weather, even though US arguments recognized it as a factor. *See* MOXLEY, *supra* note 40 (manuscript at 251-52) (noting that the United States argued at hearings that it would consider the weather as a factor in military planning).

118. *See* NATIONAL RESEARCH COUNCIL, EFFECTS OF NUCLEAR EARTH-PENETRATOR AND OTHER WEAPONS (National Academies Press 2005) [hereinafter NRC].

119. *See id.* at 73.

120. *See id.* at 80-81.

121. *See id.* at 80-92.

122. *See id.* at 82.

Hiroshima and Nagasaki do not provide reliable historical evidence of radiation effects because those bombs fell from a very high altitude creating a fallout-free zone.[123] War strategists believe tactical nuclear weapons have a unique use as earth penetrating missions.[124] The distinction between using a tactical nuclear weapon in a fallout-free zone and as an earth-penetrating weapon is extreme. Unanticipated winds for an earth-penetrating tactical nuclear strike at the target mentioned above, by a ten-kiloton bomb, could kill anywhere from three thousand to one million people.[125] Beyond this specific target example, the NRC recognized two other targets, and the results were the same: incorrect assessments of wind patterns or any other meteorological or geological considerations could lead to an exponential increase in civilian deaths because of indiscriminate radiation.[126]

NRC research shows that environmental analysis of a tactical nuclear strike would have to be flawless.[127] Nuclear states are apprehensive of passing the nuclear threshold, and, therefore, reserve the use of tactical nuclear weapons for extreme scenarios. States only consider tactical nuclear weapons in severe situations that require them to make decisions within a moment's notice. Military officials therefore cannot accurately plan for or analyze the spread of radiation, which would spread indiscriminately.[128] Despite technological advancements of missile targeting, the failure to contain or eliminate the spread of radiation from use of a

123. *Basic Effects of Nuclear Weapons*, ATOMICARCHIVE.COM (last visited Nov. 6, 2021), https://www.atomicarchive.com/science/effects/basic-effects.html [https://perma.cc/8CBH-RKY3] (recognizing that as altitude increases, fallout decreases).

124. *See* NRC, *supra* note 118, at 82 (a fallout free zone is the height at which a nuclear weapon can explode in the air without sending radioactive earth into the air which eventually would lead to it coming back down in the form of radioactive fallout).

125. This number range is considering only wind, but NRC argues that precipitation could actually drastically increase the casualty range, and others have noted that nuclear explosions increase precipitation. *See id.* at 83; *see also* Sid Perkins, *Can Nuclear Fallout Make It Rain?*, SCIENCE MAGAZINE (May 13, 2020), https://www.sciencemag.org/news/2020/05/can-nuclear-fallout-make-it-rain#:~:text=Radioactive%20fallout%20is%20rarely%20a,caused%20water%20droplets%20to%20coalesce [https://perma.cc/XQ86-RWYR].

126. NRC, *supra* note 118, at 80-87.

127. This is an assessment of the research compiled by NRC, that work does not make this claim. *But see id.* at 86 (noting that even though NRC researched a plethora of variables, there were many more that they did not consider, such as cloud passing and formations and how those clouds would carry radiation, that would only increase the total casualties).

128. *See* NAVAL HANDBOOK, *supra* note 98, at § 9.1.2.

tactical nuclear weapon would be a breach of discrimination. The ICJ Opinion recognized that even though civilians may not be targets, the unique and extreme effects of nuclear weapons pose such an existential threat that the rule of discrimination recognizes the greater risk associated with nuclear weapons than conventional ones.[129]

### *B. Necessity*

The United States recognizes that necessity is a rule of scope to prevent unnecessary measures; if something is not necessary to accomplish a military purpose, it violates necessity.[130] For example, regardless of the type of weapon, the use of a 500-ton bomb to destroy a target that a five-ton bomb could destroy would breach necessity. Some scholars argue necessity is not a weapon-specific test but rather an analysis of a variety of considerations about military objectives.[131] Some branches of the United States' military argue that so long as a weapon is not designed to create superfluous human injury, it is not "unnecessary force."[132] However, other branches argue that force in excess of what is required to complete a mission is unlawful.[133] Combining these two definitions acknowledges that unnecessary or excessive destruction of civilian life or property is unlawful.[134] For that reason, complying with the rule of necessity relies on two things: that a weapon does not create superfluous injury and that it does not destroy to a degree more than necessary for military success.[135]

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129. Nuclear Weapons Advisory Opinion, *supra* note 3, at 262, ¶ 92.

130. *See Military Necessity*, INT'L COMM. OF THE RED CROSS (last visited Nov. 28, 2020), https://casebook.icrc.org/glossary/military-necessity#:~:text=The%20principle%20of%20military%20necessity%20is%2C%20like%20the,are%20not%20otherwise%20prohibited%20by%20international%20humanitarian%20law [https://perma.cc/SR2N-FN5W]; *see also* DARCY, *supra* note 104, at 150 (noting that some ICJ judges recognized necessity as a principle which serves to preserve basic humanity considerations).

131. *See generally* WALZER, *supra* note 38, at 138-59.

132. *See* NAVAL HANDBOOK, *supra* note 98, at § 9.1.1.

133. *See* TONYA HAGMAIER ET AL., AIR FORCE OPERATIONS AND THE LAW 14 (2d ed. 2009).

134. *See* NAVAL HANDBOOK, *supra* note 98, at § 9.1.1; *see also* HAGMAIER ET AL., *supra* note 133, at 14.

135. Superfluous injury is more readily attributed to protecting soldiers, but it also applies to civilians, and necessary destruction is more readily attributed to civilians. Because the purpose of the Law of Armed Conflict is to protect civilians, both are necessary

1. Superfluous Injury and Death by Radiation

Hollow tip bullets, poison bullets, and glass bombs are three paradigmatic examples of an unnecessary weapon.[136] Hollow tips are also known as "exploding" bullets because their weak casing causes them to shatter upon impact.[137] Poison bullets are exactly as the name suggests; bullets imbued with poison to make any hit fatal.[138] Glass bombs are designed to explode and send untraceable shards of glass into combatants, leaving them inoperably injured.[139] All of these weapons are considered "small arms"[140] and do not pose any threat to property like nuclear weapons would. Like nuclear weapons, however, these illegal weapons ensure the unnecessary death of an enemy who may otherwise survive while still being sufficiently removed from combat, such as by significant, nonlethal injury.[141]

Tactical nuclear weapons offer the same type of superfluous injury as the aforementioned illegal weapons by radiation spread.

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for a definition because both apply to civilians. *See* US AIR FORCE, ANNEX 3-60 BASIC PRINCIPLES OF THE LAW OF WAR AND THEIR TARGETING IMPLICATIONS, 89-90 (Mar. 15, 2019) (noting that the principle of unnecessary, also known as superfluous, suffering is sometimes recognized as a principle by itself or under the umbrella of necessity); *see, e.g., Practice Relating to Rule 70. Weapons of a Nature to Cause Superfluous Injury or Unnecessary Suffering*, INT'L COMM. OF THE RED CROSS, (last visited Nov. 6, 2021), https://ihl-databases.icrc.org/customary-ihl/eng/docs/v2_rul_rule70 [https://perma.cc/KV5F-2DCT] ("[R]elated to the principle of military necessity, and implicitly contained within it, is the principle of unnecessary suffering.") [hereinafter "IRCR Superfluous Injury"].

136. U.S. DEP'T OF THE ARMY, THE LAW OF LAND WARFARE: FIELD MANUAL NO. FM 27–10 (with change 1976) [hereinafter Law of Land Warfare]; *see also* IRCR Superfluous Injury, *supra* note 135, at XI ("[S]pecific applications of the prohibition formulated in … the Hague Regulations [are] … explosive bullets and projectiles filled with glass[,] … bullets of irregular shape or with a hollowed out nose[,] … [and] poison and poisoned weapons.").

137. *See Ammunition Illegal and Controversial Ammunition*, LAWS.COM (Dec. 22, 2019), https://gun.laws.com/ammunition/ammunition-illegal-and-controversial-ammunition#:~:text=Military%20use%20of%20the%20hollow%20tips%20is%20prohibited,fatal%20than%20bullets%20that%20pierce%20through%20a%20target [https://perma.cc/TJ7P-U3KA].

138. *See* KIM COLEMAN, A HISTORY OF CHEMICAL WARFARE 7 (2005).

139. *See* MOXLEY, *supra* note 40 (manuscript at 114-15).

140. *See Small Arms and Light Weapons*, GLOBALSECURITY.ORG (last visited Nov. 11, 2020), https://www.globalsecurity.org/military/systems/ground/small-arms.htm [https://perma.cc/R67L-VMGE].

141. These deaths are considered "unnecessary" because combatants would lose their warfighting capabilities after being removed from the battlefield due to a substantial injury from either a bullet ripping through them or from the shockwaves of a bomb. The true goal of warfighting tactics is not to kill, but, rather, to prevent the enemy from continuing to fight whether by death or disability. *See* WALZER, *supra* note 38, at 143-44.

Nuclear weapons are designed to eliminate the physical trace of everything in the targeted zone by an extreme blast which releases heat at the same temperature as the center of the sun.[142] A tactical nuclear strike would annihilate the target, vaporize any organic matter close enough to the blast, and almost certainly reduce structures to rubble.[143] Evidence from the Hiroshima bombing, a low-yield strategic nuclear weapon,[144] shows that standing building frames were an anomaly and the only remnants of human bodies within the blast radius were the "shadows" burned into the pavement by blasts of extreme heat.[145]

Those that do survive are by no means safe.[146] The bombings of Hiroshima and Nagasaki resulted in increased leukemia cases in both adults and children in the fallout zone for nearly a decade after the explosion.[147] The NRC research above further supports that both soldiers and civilians could be subject to excessive

142. *See How Do Nuclear Weapons Work?*, UNION OF CONCERNED SCIENTISTS (July 12, 2018), https://www.ucsusa.org/resources/how-nuclear-weapons-work [https://perma.cc/72GB-52F3] (stating the heat from a nuclear blast reaches several tens of millions of degrees within a fraction of a second).

143. S*ee Basic Effects of Nuclear Weapons*, *supra* note 123 ("Most damage comes from the explosive blast. The shock wave of air radiates outward, producing sudden changes in air pressure that can crush objects, and high winds that can knock objects down. In general, large buildings are destroyed by the change in air pressure, while people and objects such as trees and utility poles are destroyed by the wind."); *see also Thermal Radiation*, ATOMICARCHIVE.ORG (last visited Nov. 6, 2021), https://www.atomicarchive.com/science/effects/thermal-radiation.html [https://perma.cc/4N8S-ERKD] ("Temperatures of a nuclear explosion reach those in the interior of the sun, about 100,000,000° Celsius, and produce a brilliant fireball.").

144. *Bombing of Hiroshima and Nagasaki*, *supra* note 11 (Little Boy was the bomb dropped on Hiroshima, and it was between twelve and fifteen kilotons); *see also* ALEXANDER & MILLER, *supra* note 5, at 5.

145. Lottie Tiplady-Bishop, *Hell on Earth*, SUN (Aug. 5, 2020), https://www.thesun.co.uk/news/12321021/harrowing-images-reveal-devastation-hiroshima-nagaski/ [https://perma.cc/6NZ3-5TRC]; *see also* Katie Serena, *The Eerie Shadows Of Hiroshima That Were Burned Into The Ground By The Atomic Bomb*, ALLTHATSINTERESTING.COM (July 31, 2020), https://allthatsinteresting.com/hiroshima-shadows [https://perma.cc/C3JQ-K4U2]; Nick Kirkpatrick, *69 Years After Hiroshima, a Look at the Dome that Survived*, WASH. POST (Aug. 6, 2014), https://www.washingtonpost.com/news/morning-mix/wp/2014/08/06/69-years-after-hiroshima-a-look-at-the-dome-that-survived/ [https://perma.cc/W7GA-7XJP].

146. *See* Dan Listwa, *Hiroshima and Nagasaki: The Long Term Health Effects*, COLUM. UNIV. CTR. FOR NUCLEAR STUDIES (Aug. 9, 2012), https://k1project.columbia.edu/news/hiroshima-and-nagasaki [https://perma.cc/BD6S-KZ3J] ("[I]t may be many years after exposure before an increase in the incident rate of cancer due to radiation becomes evident.").

147. *See id.*

radiation and sicknesses resulting therefrom.[148] The ICJ Opinion recognized that it would be extremely difficult for a state to create a nuclear weapon that would not cause unnecessary suffering.[149] The International Committee of the Red Cross' research further supports this, citing numerous sources holding that nuclear weapons cause unnecessary suffering.[150]

2. Unnecessarily Excessive Because of Nuclear Winter

Radiation is an inescapable consequence of using a tactical nuclear weapon and any discussion surrounding the legal use of such a weapon must consider it.[151] Countries must be able to control their weapons from causing superfluous injury. The US Air Force argues that controlling radiation is not relevant to targeting and, as a result, collateral effects are not relevant to necessity.[152] However, the ICJ disagreed with this interpretation.[153] The United States does not control radiation from tactical nuclear weapons, even though it argues that it complies with necessity's superfluous injury requirement in regards to radiation because the initial strike is controllable.[154] In 2015, the Department of Defense recognized that control is influenced by a weapon's effects, which may signal

148. *See* NRC, *supra* note 118; *see also supra* Section IV.A.

149. Nuclear Weapons Advisory Opinion, *supra* note 3, at 262-63, ¶ 95. The court left the door open to clean nuclear weapons:

> [I]n view of the unique characteristics of nuclear weapons, to which the Court has referred above, the use of such weapons in fact seems scarcely reconcilable with respect for [complying with discrimination and necessity by way of unnecessary suffering]. Nevertheless, the Court considers that it does not have sufficient elements to enable it to conclude with certainty that the use of nuclear weapons would necessarily be at variance with the principles and rules of law applicable in armed conflict in any circumstance. *Id.*

150. *See generally Rule 70. Weapons of a Nature to Cause Superfluous Injury or Unnecessary Suffering*, CUSTOMARY IHL (last visited Mar. 21, 2021), https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule70#Fn_3460CD3C_00055 [https://perma.cc/V5KF-6THS].

151. *See* Bengs, *supra* note 94, at 327.

152. MOXLEY, *supra* note 40 (manuscript at 111).

153. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 242-44 (arguing that if a country were to use a nuclear weapon, the unique characteristic of radiation is so extreme that it must be accounted for to comply with necessity; the ICJ argued that necessity demands that radiation cannot so severely affect the environment unless use of nuclear weapon was absolutely necessary to military success, and, therefore, recognized that the weapons effects are more important than the weapon itself).

154. *See* MOXLEY, *supra* note 40 (manuscript at 111-12).

a transition away from the older Air Force definition of necessity.[155] Likewise, the ICJ in other judicial opinions has argued that destroying property after military action is no longer necessary is a crime.[156] This idea may give weight to an argument that radiation is unnecessary because radiation initiates continuous destruction after military action is no longer necessary.

Military analysts judge necessity by a standard of subjective reasoning, and collateral damage can be justified if the destruction of towns is marginal compared to the military victory achieved.[157] Nuclear winter is a climate condition which would kill crops, cause colder temperatures, and inevitably kill people all over the globe.[158] Additionally, an exchange of low-yield weapons in a regional conflict could easily lead to nuclear escalation and, subsequently, nuclear winter.[159] Therefore, an analysis of necessity for use of any tactical nuclear weapon should fail immediately if there is no consideration of escalation and collateral damage from radiation and nuclear winter.[160] Radiation would persist on the land struck by a tactical nuclear weapon for decades or centuries after a strike and could spread across the globe.[161] Therefore, using

155. *Id.* (manuscript at 129) (citing OFFICE OF GENERAL COUNSEL, DEP'T OF DEF., DEPARTMENT OF DEFENSE LAW OF WAR MANUAL §6.7.4 at 342-43, 2015).

156. DARCY, *supra* note 104, at 149.

157. *See id.* at 147.

158. *Nuclear Winter*, BYJUS (last visited Dec. 12, 2020), https://byjus.com/biology/nuclear-winter/ [https://perma.cc/KR9N-BGR2].

159. MOXLEY, *supra* note 40 (manuscript at 760-61) (citing studies that concluded that nuclear winter would occur as a result of a regional nuclear war between India and Pakistan in which 100 fifteen kiloton nuclear weapons were used); *see also* Fred Kaplan, *The Senseless Danger of the Military's New "Low-Yield" Nuclear Warhead*, SLATE (Feb. 18, 2020), https://slate.com/news-and-politics/2020/02/low-yield-warhead-nuclear-weapons-navy-trident-submarines.html [https://perma.cc/9V8A-XD4W]; Seth Baum, *Winter-Safe Deterrence: The Risk of Nuclear Winter and Its Challenge to Deterrence*, 36 CONTEMP. SECURITY POL'Y 123 (2015).

160. *See* Moxley, *supra* note 40 (manuscript at 111) (noting that military action is illegal if radiation does more harm than military benefit).

161. The Chernobyl was a localized, small nuclear explosion in Chernobyl, Ukraine in 1986. The melt down of nuclear reactor at Chernobyl led to a 0.3kt explosion, but "the lighter material was carried by wind over Ukraine, Belarus, Russia, and to some extent over Scandinavia and Europe." The Chernobyl accident is a premier example of how small nuclear explosions at ground level can send fallout scattered across the globe. *Chernobyl Accident 1986*, WORLD-NUCLEAR.ORG (May 2021), https://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/chernobyl-accident.aspx [https://perma.cc/2PL4-MRFY]; *see also* Henry Ridgwell, *30 Years On, Chernobyl Still Leaks Radiation*, VOA (April 26, 2016), https://www.voanews.com/europe/30-years-chernobyl-still-leaks-radiation

a tactical nuclear weapon against a limited military target is excessive, unnecessary force because it scars the earth so violently with radiation and could lead to nuclear escalation and, ultimately, nuclear winter.

The United States argues that radiation is irrelevant because it did not consider it as an important means to destroying the objective.[162] This argument is flawed when considering the possibilities of nuclear winter and nuclear escalation. Some scholars argue that once the nuclear threshold is passed, even by use of a tactical nuclear weapon, nuclear war could easily become the norm.[163] In a different case, the ICJ recognized a duty for states to conduct war in a manner that limits the amount of catastrophe; use of a tactical nuclear weapon would fail that duty.[164]

### 3. Unnecessarily Excessive because of Advancements in Conventional Weapons' Capabilities

Nuclear weapons clearly have an inconceivable capacity to destroy,[165] and various scholars recognize that this destructive power is unnecessarily excessive for missions that seek to use tactical nuclear weapons.[166] Previous predictions about the

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[https://perma.cc/KL5S-3XYB]; Christina Maza, *Is Chernobyl Safe? Can You Live There Now? Experts Explain the Risks*, NEWSWEEK (May 5, 2019), https://www.newsweek.com/chernobyl-safe-now-when-will-1414489#:~:text=It%20depends%20on%20which%20part%20of%20Chernobyl%20you%27re,it%20will%20be%20until%20Chernobyl%20is%20completely%20safe [https://perma.cc/4Q8Y-5Q42]; Kaplan, *supra* note 159; MOXLEY, *supra* note 40 (manuscript at 712-13).

162. MOXLEY, *supra* note 40 (manuscript at 248-51).

163. *See* Kaplan, *supra* note 159; MOXLEY, *supra* note 40 (manuscript at 274-75) (noting that use of a nuclear weapon will inherently escalate conflict); Nelson, *supra* note 22, at 69 (noting that the idea of tactical nuclear weapons as a clean, surgical strike is a "dangerous myth" both because it is factually untrue and would lead to escalation).

164. DARCY, *supra* note 104, at 145 (citing *International Military Tribunal for the Far East, Judgment of Justice Pal*, *in* DOCUMENTS ON THE TOKYO INTERNATIONAL MILITARY TRIBUNAL 809, 830 (Neil Boister and Robert Cryer eds., 2008)).

165. *See* Ashley Kirk, *How Many Nukes are in the World and What Could they Destroy?*, THE TELEGRAPH (July 4, 2017), https://www.telegraph.co.uk/news/0/many-nukes-world-could-destroy/ [https://perma.cc/B97Z-UEM8].

166. This idea has been gaining traction since 2000. *See* Stephen Younger, *Nuclear Weapons in the Twenty-First Century*, FEDERATION OF AMERICAN SCIENTISTS (June 27, 2000), https://fas.org/nuke/guide/usa/doctrine/doe/younger.htm#:~:text=Advances%20in%20conventional%20weapons%20technology%20suggest%20that%20by,might%20require%20a%20nuclear%20weapon%20for%20assured%20destruction [https://perma.cc/74TL-V3HD] ("[A]dvances in conventional weapons technology

destructive strength of conventional weapons have come to fruition.[167] The United States has continued to develop bigger and stronger conventional weapons in an effort to maintain global and regional superiority.[168] Two conventional weapons, one nicknamed the Mother of All Bombs ("MOAB")[169] and the other only referred to by its official name GBU-57 Massive Ordinance Penetrator ("MOP"),[170] have revealed that tactical nuclear weapons are unnecessary because these conventional weapons are capable of immense destruction.

The United States used the MOAB in 2017 for the first time and it delivered a payload of approximately eleven tons of TNT.[171] The United States used the bomb against Islamic State forces in Afghanistan and targeted systems of tunnels and caves.[172] While

suggest that by 2020 precision long-range conventional weapons may be capable of performing some of the missions currently assigned to nuclear weapons.").

167. *See* Luke O'Brien, *Let's Get Something Straight About Nuclear Weapons*, MODERN WAR INSTITUTE AT WEST POINT (Mar. 26, 2019), https://mwi.usma.edu/lets-get-things-straight-nuclear-weapons/ [https://perma.cc/5WV8-GN68] ("Even when it comes to attacking static targets like key logistics nodes, ports of entry, and headquarters, one sees that while nuclear weapons pose an obvious threat to them, so too do sufficiently advanced conventional weapons."); John Mueller, *Nuclear Weapons Don't Matter*, CATO INST. (Oct. 15, 2018), https://www.cato.org/publications/commentary/nuclear-weapons-dont-matter [https://perma.cc/S3ZU-TQZ9] ("[B]ecause there simply aren't many targets that can't be attacked as effectively with conventional weapons.").

168. *See* Frank Rose, *As Russia and China Improve Their Conventional Military Capabilities, Should the US Rethink its Assumptions on Extended Nuclear Deterrence?*, BROOKINGS (Oct. 23, 2018), https://www.brookings.edu/blog/order-from-chaos/2018/10/23/as-russia-and-china-improve-their-conventional-military-capabilities-should-the-us-rethink-its-assumptions-on-extended-nuclear-deterrence/ [https://perma.cc/ALP5-CC24].

169. Abigail Abrams, *The U.S. Just Dropped the 'Mother of All Bombs' in Afghanistan. But What Is That?*, TIME (April 13, 2017), https://time.com/4739302/mother-of-all-bombs-afghanistan-what-is-that/ [https://perma.cc/GN3Z-9Q5C]; *see also* Robin Wright, *Trump Drops the Mother of All Bombs on Afghanistan,* NEW YORKER (April 14, 2017), https://www.newyorker.com/news/news-desk/trump-drops-the-mother-of-all-bombs-on-afghanistan [https://perma.cc/M45A-2QMK].

170. *Air Force Posts Video of B-2 Dropping Two GBU-57 Massive Ordnance Penetrator (MOP) Bunker-Busting Bombs*, MILITARY AEROSPACE & ELEC. (May 20, 2019), https://www.militaryaerospace.com/home/article/14033495/air-force-posts-video-of-b2-dropping-two-gbu57-massive-ordnance-penetrator-mop-bunkerbusting-bombs [https://perma.cc/P4FA-7AAV].

171. Zack Beauchamp, *MOAB, the Largest Non-Nuclear Bomb Ever Used by the US Military, Explained*, VOX (April 14, 2017), https://www.vox.com/world/2017/4/13/15292418/moab-mother-of-all-bombs [https://perma.cc/D9ZG-75KY].

172. Wright, *supra* note 169.

many regard the mission as successful,[173] others note that it did not substantially change the course of events in the region.[174] This failure was not because the blast was insufficient, but rather because of the number of connected caves and tunnels.[175] Use of a weapon more powerful than the MOAB, notably a tactical nuclear weapon, would have had the same military success as the MOAB because the limitations of the MOAB strike were not due to weapon characteristics; notably, the weapon had a comparable blast radius.[176]

Though its tonnage is substantially lower than the fifteen-kiloton ceiling for tactical nuclear weapons considered in this Note, the MOAB shares some characteristics to tactical nuclear weapons.[177] One such characteristic is blast: the MOAB and Little Boy, a fifteen-kiloton nuclear weapon, both have a blast radius of one mile.[178] Another similar characteristic is the response to its use. While some commentators argued that the force was excessive, military officials noted that this strike was necessary.[179] There has been no other target that merits the use of the MOAB.[180] Even use of this eleven ton conventional bomb against non-state terrorists drew sharp criticism by Afghani politicians.[181] Based on responses to the MOAB strike, arguments around nuclear escalation as a response to use of a tactical nuclear weapon are

173. *See e.g., id.*; Beauchamp, *supra* note 171; Helene Cooper & Mujib Mashal, *U.S. Drops 'Mother of All Bombs' on ISIS Caves in Afghanistan*, N.Y. TIMES (Apr. 13, 2017), https://www.nytimes.com/2017/04/13/world/asia/moab-mother-of-all-bombs-afghanistan.html [https://perma.cc/S5FX-8MV5].

174. *See The Mother of All Bombs: How Badly did it Hurt IS in Afghanistan?*, BBC NEWS (April 27, 2017), https://www.bbc.com/news/world-asia-39705128 [https://perma.cc/78E9-SEBW].

175. *Id.*

176. *See* Tayag, *supra* note 7.

177. *Id.*

178. *Id.*

179. *See U.S. Drops "mother of all bombs" in Afghanistan, Marking Weapon's First Use*, CBS NEWS (April 13, 2017), https://www.cbsnews.com/news/us-drops-mother-of-all-bombs-in-afghanistan-marking-weapons-first-use/ [https://perma.cc/AV7N-HJ8H].

180. Sune Rasmussen, *'It Felt like the Heavens were Falling': Afghans Reel from Moab Impact*, THE GUARDIAN (Apr. 13, 2017, 4:25 PM), https://www.theguardian.com/world/2017/apr/14/it-felt-like-the-heavens-were-falling-afghans-reel-from-moabs-impact#:~:text=A%20GPS%2Dguided%20demolition%20bomb,of%20more%20than%20a%20mile [https://perma.cc/6M8T-JD2G].

181. *See U.S. Drops "Mother of All Bombs" in Afghanistan, Marking Weapon's First Use, supra* note 179.

quite convincing.[182] In many respects, the MOAB accomplishes everything a tactical nuclear weapon would be used for but without emitting excess radiation.[183] Furthermore, MOAB showcased just how likely escalation would be on account of the extreme negative feedback from Afghani politicians who saw the event as the United States using Afghanistan as a testing ground for new weapons, saying that Afghans need to fight back against these acts.[184]

The MOP is the largest non-nuclear weapon in the United States arsenal and, unlike the MOAB, has never been used in combat.[185] The US military designed the MOP to be a "bunker buster," a bomb which destroys hard and deeply buried targets; the MOP's destructive capabilities have been consistently updated and improved for years.[186] One reason behind updating the MOP was to target the Iranian nuclear facility at Fordo.[187] In 2019, reports about the current upgrades to the MOP stated that it is more capable of reaching the underground target than any previous variant,[188] which compounds statements made in 2013 by the United States reassuring Israel that the MOP could destroy the

182. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 245.

183. *See* Fatima Tlis, *Sputnik: U.S. MOAB Caused 'Radiation' Diseases in Afghanistan*, POLYGRAPH (July 31, 2017), https://www.polygraph.info/a/sputnik-afghanistan-us-moab-radiation-refuted/28641772.html [https://perma.cc/C9MN-B8FH] (refuting the notion that the MOAB had created any radioactive fallout). Nuclear weapons are distinguished from conventional weapons because they use radioactive materials, conventional weapons, like the MOAB, do not use or create radiation. *See U.S. Drops "Mother of all Bombs" in Afghanistan, Marking Weapon's First Use*, *supra* note 179; Rasmussen, *supra* note 180; *The Mother of All Bombs: How badly did it hurt IS in Afghanistan?*, *supra* note 174.

184. The strike was used against stateless terrorists, the Islamic State, but some Afghani politicians were appalled at the Trump administration's disregard for Afghani land, arguing that this was an unnecessary show of force to test new dangerous conventional weapons. *See U.S. Drops "Mother of all Bombs" in Afghanistan, Marking Weapon's First Use*, *supra* note 179.

185. *See Air Force Posts Video of B-2 Dropping Two GBU-57 Massive Ordnance Penetrator (MOP) Bunker-Busting Bombs*, *supra* note 170.

186. Christopher Woody, *The Air Force is Ordering More of its Biggest Nonnuclear Bomb — Designed to Take Out Underground Targets like Those in North Korea or Iran*, BUS. INSIDER (Feb. 23, 2018, 4:06 PM), https://www.businessinsider.com/air-force-ordering-more-gbu-57-massive-ordnance-penetrators-2018-2 [https://perma.cc/7DN9-LKWC].

187. Joseph Trevithick, *Air Force Updates Massive Ordnance Penetrator Bombs Amid New Iranian Nuclear Posturing*, THE DRIVE (Nov. 5, 2019), https://www.thedrive.com/the-war-zone/30872/air-force-updates-massive-ordnance-penetrator-bombs-amid-new-iranian-nuclear-posturing [https://perma.cc/L2DU-74VY].

188. *See id.*

facility at Fordo.[189] Compared to tactical nuclear bunker-busters discussed below, the MOP would be more successful and would not have the dangers of radiation and nuclear escalation.[190]

Based on the factual considerations of superfluous injury and military necessity, the rule of necessity cannot justify the use of tactical nuclear weapons. The United States does not recognize excess radiation as an issue of necessity,[191] but the ICJ recognized that radiation emission is a breach of necessity.[192] Radiation emission and dispersion is not necessary for the success of any operation which uses a tactical nuclear weapon.[193] Rather, radiation's uncontrollability from use of a tactical nuclear weapon is a violation of necessity. Furthermore, extremely powerful conventional weapons, albeit largely possessed by the United States, are as good as or sometimes better than tactical nuclear weapons at completing limited or battlefield missions.[194] Tactical nuclear weapons, as shown, cause superfluous injury and are an unnecessary amount of force when used as battlefield strikes.

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189. *US to Israel: Redesigned Bomb Can Destroy Fordo Nuke Plant*, YNET NEWS (May 3, 2013), https://www.ynetnews.com/articles/0,7340,L-4375597,00.html [https://perma.cc/BRX6-W9PJ].

190. *See* discussion *infra* Section IV.C; *see also Air Force Asks Boeing to Build Bunker-Busting Super Bomb with Ruggedized Guidance for Deeply Buried Targets*, MILITARYAEROSPACE (Sept. 20, 2021), https://www.militaryaerospace.com/sensors/article/14210552/bunkerbusting-super-bomb-ruggedized-guidance# [https://perma.cc/48W2-NPLD] ("The conventional Massive Ordnance Penetrator is 20 feet long, and is designed to penetrate targets more deeply on impact than any other existing nuclear bunker-busting weapon, and then detonating its three-ton explosives payload.").

191. *See* U.S. Air Force, International Law: The Conduct of Armed Conflict and Air Operations 6-5 (Nov. 19, 1976) ("[T]he use of explosive nuclear weapons, whether by air, sea or land forces, cannot be regarded as violative of existing international law in the absence of any international rule of law restricting their employment."); The United States, in its brief to the Court, distinguished nuclear from poison weapons by saying that although the weapons "may create toxic byproducts" this does not cause it to be a poison weapon. Nuclear Weapons Advisory Opinion *supra* note 3, United States Br. at 24. The United States also failed to mention radiation in its brief, noting only that the power of a nuclear weapon is not inherently going to create unnecessary suffering. Nuclear Weapons Advisory Opinion *supra* note 3, United States Br. at 28.

192. Nuclear Weapons Advisory Opinion, *supra* note 3, at 262, ¶ 92, 95 (calling nuclear weapons' superfluous injury "scarcely reconcilable with respect" to necessity).

193. This statement does not include use of a neutron bomb, the aforementioned failed project to design a clean nuclear bomb. *See, e.g., Neutron Bomb*, *supra* note 106.

194. *See US to Israel: Redesigned Bomb Can Destroy Fordo Nuke Plant*, *supra* note 194; *see also* Tayag, *supra* note 176; Woody, *supra* note 186; *Air Force Posts Video of B-2 Dropping Two GBU-57 Massive Ordnance Penetrator (MOP) Bunker-Busting Bombs, supra* note 170; Beauchamp, *supra* note 171; O'Brien, *supra* note 167; Mueller, *supra* note 167.

### *C. Proportionality*

Proportionality does not consider only the size of weapons, but also whether civilian casualty is proportionate to the military necessity.[195] Even though a conventional bomb could destroy a remote submarine, a tactical nuclear weapon could do the same and there would still be no direct civilian casualties from the blast or heat. However, the submarine being alone in a remote ocean does not mean that a pre-strike analysis should not consider civilian casualties[196] because radiation dispersion and extreme oceanic storms could be disastrous.[197] Worth noting, contemporary proportionality is largely customary law, and, like necessity, is not binding based on words in a treaty, but rather by the collective action of states.[198] As a customary law, the general doctrine of proportionality requires a state to justify the value of civilian casualty against military necessity.[199]

195. *See* A.P.V. Rogers, *The Principle of Proportionality*, *in* THE LEGITIMATE USE OF MILITARY FORCE, 189, 189 (Howard M. Hensel ed., 2008); *see also* MOXLEY, *supra* note 40 (manuscript at 69) (failing to comply with proportionality means the "probable effects [of a weapon] upon non-combatant persons or objects would likely be disproportionate to the value of the anticipated military objective").

196. *See* Rogers, *supra* note 195, at 189 (noting that the International Committee of the Red Cross argues that every party to war must make an assessment to civilian casualty for any strike).

197. There is little evidence as to the effects of underwater low-yield nuclear explosions. However, tests of these low-yield weapons (roughly twenty kilotons) in the Pacific in the 1940s and 1950s showed that the detonations destroyed the seafloor and released huge amounts of radioactive particles into the air. Additionally, in most instances of low-yield underwater nuclear tests, scientists were surprised at how unexpectedly disastrous the weapons were. *See* Sarah Laskow, *Decades Ago, the U.S. Military Set Off a Nuke Underwater, And It Went Very Badly*, ATLAS OBSCURA (July 19, 2016), https://www.atlasobscura.com/articles/70-years-ago-the-us-military-set-off-a-nuke-underwater-and-it-went-very-badly [https://perma.cc/UUJ3-SYUL].

198. Rogers, *supra* note 195, at 195-96; *see also Customary Law*, INT'L COMM. OF THE RED CROSS (last visited Nov. 22, 2020), https://www.icrc.org/en/war-and-law/treaties-customary-law/customary-law [https://perma.cc/XZ2G-NEMR] ("Customary international law . . . can be found in official accounts of military operations but is also reflected in a variety of other official documents, including military manuals, national legislation and case law."); MOXLEY, *supra* note 40 (manuscript at 69-74) (describing proportionality through various United States armed forces' manuals).

199. *See* Rogers, *supra* note 195, at 203.

### 1. Nuclear Risk Exceeds Any Risk Associated with Conventional Weapons

All nuclear weapons pose a distinct existential threat to the world, and considering any nuclear strike as threatless to civilians is a fallacy because radiation and escalation are virtually certain. The ICJ Opinion did not entertain risk analysis[200] but recognized that nuclear weapons of any yield pose such a unique threat that all nuclear weapons and the associated risks are necessary considerations if a state plans to use a nuclear weapon.[201] One scholar argued that states would only be able to legally use any nuclear weapon if the state's very survival was at stake.[202] However, the scholar continues, it seems highly unlikely that targeting a submarine or some other remote, limited target, like a bunker, would eliminate such an existential threat.[203]

Also, consider that tactical nuclear weapons are limited not only by size but by delivery method.[204] It is highly unlikely that a tactical nuclear weapon would be within a reasonable distance for which a counter strike would be possible.[205] Therefore, tactical

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200. Nuclear Weapons Advisory Opinion, *supra* note 3, at 245, ¶ 43. States without nuclear weapons argue that the "

> [The] very nature of nuclear weapons, and the high probability of an escalation of nuclear exchanges, mean that there is an extremely strong risk of devastation. The risk factor is said to negate the possibility of the condition of proportionality being complied with. *The Court does not find it necessary to embark upon the quantification of such risks; nor does it need to enquire into the question whether tactical nuclear weapons exist which are sufficiently precise to limit those risks*: it suffices for the Court to note that the very nature of all nuclear weapons and the profound risks associated therewith are further considerations to be borne in mind by States believing they can exercise a nuclear response in self-defense in accordance with the requirements of proportionality. *Id.* (emphasis added).

201. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 245, ¶ 43 ("It suffices for the Court to note that the very nature of all nuclear weapons and the profound risks associated therewith are further considerations to be borne in mind by States believing they can exercise a nuclear response in self-defence in accordance with the requirements of proportionality.").

202. DARCY, *supra* note 104, at 195-96.

203. *See id*. at 194-96.

204. *See* WOOLF, *supra* note 78, at 8-9.

205. Considering that most U.S. tactical nuclear weapons are air delivered, meaning that aircraft would have to be scrambled to deliver the payload, U.S. tactical nuclear weapons are not readily aimed at a fixed target as was the case during the Cold War. *See* WOOLF, *supra* note 78, at summary page ("The United States now has, according to unclassified estimates, approximately 230 nonstrategic nuclear weapons, with around 100 deployed with aircraft in Europe and the remaining stored in the United States.").

nuclear weapons, which are characterized as useful for missions targeting a lone submarine or underground bunker, would be insufficient to cure an existential threat and are a disproportionate response.[206] A tactical nuclear weapon could be used to eliminate the threatening state's headquarters or capital, but that strike would likely result in mass civilian casualties and is therefore a breach of the other principles of the Law of Armed Conflict and would not be a limited battlefield strike.

The most justifiable use of a tactical nuclear weapon is when the survival of the state is at stake. That use, however, would likely not end that existential threat and ensure the state's survival and thus should not merit the use of a tactical nuclear weapon. The "best case scenario" for legal use seems to pose a fatal flaw, notably that the military advantage would be disproportionate and insignificant to civilian loss of life and property.[207] A more justifiable use than self-defense would be a limited strike against a remote target, but that use could lead to an escalation of nuclear warfare. Complying with proportionality means considering that escalation.[208] If the only viable justification to pass the nuclear threshold is the preservation of a state's very existence, and if tactical nuclear weapons are ineffective toward that end,[209] then

206. *See* Hans Kristensen, *Declassified: US Nuclear Weapons at Sea*, FEDERATION OF AMERICAN SCIENTISTS (Feb. 3, 2016), https://fas.org/blogs/security/2016/02/nuclear-weapons-at-sea/ [https://perma.cc/TNG4-ZHNZ] ("The tactical naval nuclear weapons were considered more acceptable to use early in a conflict because there would be few civilian casualties. But any use would probably quickly have escalated into large-scale nuclear war and the end of the world as we know it.").

207. This scenario is based on one submarine being attacked by a tactical nuclear weapon. If there were, say, a fleet of nuclear submarines attack a state and that state responded with a volley of tactical nuclear weapons, that creates an issue of magnitude [of whether the analysis should be on one missile or the volley] and largely outside the scope of this paper. Also, that scenario would certainly lead to an extensive nuclear exchange and, thus, not worthy of discussion here because the Big Three principles would certainly be violated at some point in the ensuing exchange. *See supra* Section IV.A-B (arguing that the facts of use only one tactical nuclear weapon in any environment would disperse indiscriminate effects in the form of radiation, that a volley of these weapons would only magnify that indiscriminate effect, and passing the nuclear threshold is unnecessary and would escalate conflicts).

208. John Burroughs, *International Law and First Use of Nuclear Weapons*, WAGINGPEACE.COM (Feb. 28, 2018), https://www.wagingpeace.org/international-law-first-use-nuclear-weapons/ [https://perma.cc/Q4ML-JRFD] ("The risk of escalation is part of the proportionality calculus.").

209. Nuclear Weapons Advisory Opinion, *supra* note 3, at 263, ¶ 97. Despite tactical nuclear weapons general failure to reconcile with the principles of the Law of Armed

any use of such weapons would violate the principle of proportionality.

2. Proportionality Extends Beyond Protecting Humanity

Environmental destruction and the impact of radiation are crucial considerations regardless of a tactical nuclear weapon's direct impact on humans.[210] The ICJ noted that protecting the environment is a duty borne by states regardless of what treaties they have ratified.[211] The environment poses unique issues for proportionality. Land subject to a tactical nuclear weapon's explosion can remain radioactive after the initial blast between hundreds to tens of thousands of years.[212] A strike in a remote part of the ocean where nuclear material remains radioactive and highly mobile would be similarly devastating.[213] As noted before, earth-penetrating and underground blasts are disastrous in terms of the radiation dispersion that they can cause.[214] In the same manner, underwater tactical nuclear explosions disperse radiation into the air, depending on ocean depth and how deeply a bomb explodes, by destroying the seafloor and sending radioactive materials up the column of the blast into the atmosphere.[215]

Fire is a result of thermal radiation - a characteristic unique to nuclear weapons.[216] Some areas, such as those with large pine or spruce forests, should never be the subject of a tactical nuclear strike. The combination of sensitive vegetation and the extreme heat created by the blast and subsequent radiation would create

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Conflict, the Court observed "that it cannot reach a definitive conclusion as to the legality or illegality of the use of nuclear weapons by a State in an extreme circumstance of self-defense, in which its very survival would be at stake." *Id.*

210. Nuclear Weapons Advisory Opinion, *supra* note 3, at 241, 262.

211. Nuclear Weapons Advisory Opinion, *supra* note 3, at 242, ¶ 29 ("[T]he general obligation of States to ensure that activities within their jurisdiction *and control respect the environment of other States* or of areas beyond national control is now part of the corpus of international law relating to the environment."(emphasis added)).

212. *See, e.g.,* Ridgwell, *supra* note 161; Maza, *supra* note 161.

213. SW. FISHERIES SCI. CTR., *Fukushima Radiation in U.S. West Coast Tuna*, NOAA FISHERIES (July 10, 2020), https://www.fisheries.noaa.gov/west-coast/science-data/fukushima-radiation-us-west-coast-tuna [https://perma.cc/ES47-LLC7].

214. *See supra* Section IV.A (discussing the use of tactical nuclear weapons as bunker busters and earth-penetrating weapons); *see generally* Nelson, *supra* note 22.

215. *See* Laskow, *supra* note 197 (stating that the extreme heat and the energy of the blast destroy or disperse water which can give radioactive seafloor the opportunity to enter the atmosphere).

216. *See* NRC, *supra* note 118, at 73.

massive fires.[217] Even without considering proximity of the actual blast to civilians, the fires caused by a tactical nuclear weapon would threaten civilian lives. A state would have a difficult time justifying a strike that causes such extensive environmental damage because the use of incendiary weapons on forests is illegal.[218]

### 3. Proposed Tactical Nuclear Weapon Use Would Result in Mass Casualty and Injury

The United States argues that radiation from a tactical nuclear weapon is irrelevant because its intended use as a bunker-buster would limit the radiation dispersed by trapping the blast and radioactive material underground.[219] The argument that this use would create a disproportionate response relies on the threat of environmental destruction and radiation dispersion, considerations that the ICJ saw as a necessary part of any military analysis about nuclear weapons.[220] The United States has retired or dismantled nearly all of its tactical nuclear weapons except the B61 class,[221] which was initially designed to be a bunker-buster.[222] These weapons are designed to penetrate the earth so as to destroy targets like concrete bunkers that are otherwise difficult to infiltrate.[223] The issue, however, is that every attempt to make a feasible tactical nuclear bunker-buster has been a failure.[224] This

217. *See id.* at 92; *see also Incendiary Weapons*, INT'L COMM. OF THE RED CROSS (last visited Mar. 21, 2021), https://casebook.icrc.org/glossary/incendiary-weapons [https://perma.cc/3SVJ-SZYV] [hereinafter *Incendiary Weapons*].

218. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 242; *see also Incendiary Weapons, supra* note 217.

219. *See* MOXLEY, *supra* note 40 (manuscript at 266-67); *see also* Nelson, *supra* note 22, at 69-71 (noting that the United States failed to properly develop a tactical nuclear weapon that could be used as a bunker buster or as an earth penetrating weapon even though that was the quintessential argument for why tactical nuclear weapons were a necessary addition to a strategic nuclear weapons arsenal).

220. Nuclear Weapons Advisory Opinion, *supra* note 3, at 242, ¶ 30 ("States must take environmental considerations into account when assessing what is necessary and proportionate in the pursuit of legitimate military objectives.").

221. DEP'T OF DEF., NUCLEAR POSTURE REVIEW 49 (2018).

222. ALEXANDER & MILLER, *supra* note 5, at 8; Nelson, *supra* note 22, at 70.

223. Nelson, *supra* note 22, at 69. *But see* discussion *supra* Section IV.B (noting that conventional weapons are actually better bunker busters than tactical weapons are).

224. Nelson, *supra* note 22, at 69 (noting that in 1994 the Defense Authorization Act suspended all funding on researching tactical nuclear weapons); Bengs, *supra* note 94, at 347 (noting that the B61 class of nuclear weapons are the only one that the government

failure is due to a variety of factual considerations about the environment, such as soil and rock composition, and the actual weapon itself, such as the casing being too weak to withstand the force of penetrating the earth.[225]

Assuming a tactical nuclear weapon successfully penetrated the earth, a nuclear missile with an explosive power of 0.1k would have to be 140 feet underground before radiation would be contained in favorable geological conditions.[226] The greatest depth ever achieved by a nuclear weapon has only been about twenty feet.[227] From an environmental standpoint, a tactical nuclear weapon, operating as a bunker buster, would be a devastating failure. Until 150 feet, the crater caused by a tactical nuclear weapon explosion widens as the weapon penetrates further into the Earth. As the crater widens, more radioactive material disperses into the atmosphere.[228] Therefore, if the most successful low-yield bunker-buster were able to penetrate five times deeper than its current capabilities, it would still disperse more radiation than an explosion at ground level. That weapon's failure to meet the depth requirements to contain radiation would send more particles into the air as its depth increased.[229] So, a tactical nuclear detonation as a bunker-buster is a disproportionate response to the military advantage gained. Notably, the environment and any

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has considered a feasible bunker buster, but, even then, recognized that they were useless in that capacity).

225. *See Earth-Penetrating Weapons*, UNION OF CONCERNED SCIENTISTS (June 6, 2005), https://www.ucsusa.org/resources/earth-penetrating-weapons [https://perma.cc/3EF5-Z5L8] (discussing the failures of nuclear earth penetrating weapons, notably that increased velocity is required to actually penetrate further into the Earth, but that increased velocity only results in the destruction of the casing of the warhead upon impact; also noting that "penetration depths will be larger in dry soil than concrete or rock, but one would have to expect that a hardened target would be placed below hard rock or concrete").

226. Nelson, *supra* note 22, at 70.

227. Favorable geological conditions mean that the soil and rock composition is such that it is favorable to not be blown into the area at an explosion at this depth, so, some areas that are more sand than, say, hard rock would likely need to be buried deeper because it would be easier for an explosion of the same size at the same depth to send particles into the sky. *See* Nelson, *supra* note 22, at 70; *see also Weapons of Mass Destruction*, *B61-11 Earth-Penetrating Weapon*, GLOBALSECURITY https://www.globalsecurity.org/wmd/systems/b61-11.htm [https://perma.cc/5LEH-Q6E6] (last visited Nov. 18, 2021).

228. *See Nelson*, *supra* note 22, at 75 (noting that at 150 feet and deeper the size of the crater will be relatively the same).

229. *See id.* at 69-71, 75.

nearby civilian populations would be disproportionately harmed because the failure to successfully penetrate the earth would exacerbate the problems of radiation.[230] Despite the lack of any conclusive studies on the subject, the same seems true for underwater tactical nuclear detonations.[231]

While detonating tactical missiles above ground to destroy bunkers is a possibility, those weapons would not be low-yield.[232] Research shows that it would take a 100-kiloton nuclear bomb detonated above ground to destroy a target one hundred feet underground.[233] The argument against bunker busters is compounded when considering escalation. The issue is clear: passing the nuclear threshold in this case would not amount to military success because a tactical nuclear weapon would neither ensure a successful mission nor be reliably used in self-defense.[234] The nail in the coffin is that conventional weapons operate as bunker-busters substantially better than nuclear weapons do, notably because of the weak metal casings that house nuclear warheads.[235] Conventional weapons can deliver a 5,000-pound payload at one hundred feet which, depending on the depth of the bunker and material used, could be more than enough destructive force.[236]

Though the land in Chernobyl will be radioactive for tens of thousands of years, Hiroshima is habitable today because of the altitude of the respective explosions.[237] The radiation dispersion in Hiroshima that resulted from Little Boy cannot be a basis to predict the radiation dispersion that would occur from a bunker-buster. The explosion over Hiroshima was in a "no fallout zone" and was not an earth penetrating weapon.[238] Therefore, the Hiroshima

230. *See generally* NRC, *supra* note 118.

231. *See* Laskow, *supra* note 197.

232. *See Earth-Penetrating Weapons*, *supra* note 225 (noting that in the event that a weapon cannot achieve greater penetration, an increased yield would suffice to destroy deeply buried targets).

233. *See* Nelson, *supra* note 22, at 75.

234. *See generally id.*; *see also* DARCY, *supra* note 104, at 195; *supra* Section IV.A.

235. *See* Bengs, *supra* note 94, at 347; *see also* discussion, *supra* Section IV.B.

236. *See* Bengs, *supra* note 94, at 347.

237. Hiroshima was detonated in a fallout free zone, *supra* Section IV.A.2, whereas the Chernobyl explosion happened at ground level. *See* A.C. Grimes, *How Much Radiation Still Exists in Hiroshima*?, GRUNGE (Mar. 3, 2020), https://www.grunge.com/191959/how-much-radiation-still-exists-in-hiroshima/ [https://perma.cc/5Q6B-XDN9].

238. *See* NRC, *supra* note 118, at 82.

explosion is not an example of how low-yield nuclear weapons cause little radiation dispersion because Little Boy was not a bunker-buster or earth-penetrating weapon. Thus, when considering tactical nuclear weapons, a discussion of proportionality must address radiation as an inherently disproportionate effect.

Military advantage cannot be disproportionate to the damage to civilian property and objects.[239] There is, then, an issue of time—notably, whether military commanders should have to consider the long-term impact of radiation as it affects the environment.[240] The ICJ argued that the environment must be a part of the Law of Armed Conflict analysis[241] and it recognized that nuclear weapons pose a unique threat because of their ability to influence time and space.[242] The logical conclusion, based on evidence from Hiroshima, Nagasaki, Fukushima, and Chernobyl, is that nuclear weapons devastate land long after the end of a war.[243]

If the Court were to consider this issue again, the time-environmental issue should be presented. Based on modern science,[244] the Court should recognize that nuclear weapons are a disproportionate response to any military target because of the unique effects of lasting and dispersed radiation.[245] Because of these long-term effects, and because conventional weapons are on par with the destructive power of tactical nuclear weapons, there

239. *See* Rogers, *supra* note 195, at 189-90.

240. *See* Jaroslav Krasny, *Do Tactical Nukes Break International Law?*, BULLETIN OF THE ATOMIC SCIENTISTS (Dec. 31, 2020), https://thebulletin.org/2020/12/do-tactical-nukes-break-international-law/ [https://perma.cc/9S6S-44Q6] (advocating for the position that use of a tactical nuclear weapons is always illegal because the health effects, on civilians and combatants alike, are so extreme and so long term that there is no justifiable scenario for use of a tactical weapon). Krasny notes that "the threat of invisible disease with a possible death sentence would loom for years to come. Once the sentence is given, an effective remedy is almost non-existent." *Id.* Thus, once conflict ends, and combatants are returned to civilian status, they are still subject to the direct and immediate effects of the conflict. *Id.*

241. *See* Nuclear Weapons Advisory Opinion, *supra* note 3, at 242.

242. *Id.* at 262.

243. *See* Grimes, *supra* note 237; *see also* SW. FISHERIES SCI. CTR., *supra* note 213; Ridgwell, *supra* note 161; Listwa, *supra* note 146.

244. S*ee* Hansen, *supra* note 22 (noting that until 2001, models were not comprehensive enough to ask questions like "What kind of climate anomalies would we see" because of a nuclear war).

245. *See* Ridgwell, *supra* note 161; *see also* Maza, *supra* note 161; SW. FISHERIES SCI. CTR., *supra* note 213.

is no scenario where the devasting effects of a tactical nuclear weapon can be proportional to the advantage gained. Even in the "perfect scenarios" involving remote submarines and deeply buried bunkers, civilians are still disproportionately at risk in a state's use of a tactical nuclear weapon.

### *D. Disarmament Negotiations May Resume in the Near Future*

Only a few years before the ICJ Opinion, toward the end of the Cold War, the nuclear powers began additional substantive international discussions and agreements explicitly on tactical nuclear weapons.[246] Unsurprisingly, the negotiations were largely between the United States, the Soviet Union, and, subsequently, the Russian Federation.[247] These international negotiations relied on domestic promises, however, and have not been actually limited by any US-Russian agreements.[248] Fortunately, no tactical nuclear weapon has been used despite this weak position on restraining from use.[249] The entire world, since the conception of the nuclear weapon, has anxiously feared doomsday while being protected only by handed-down promises made by leaders of the world's superpowers.[250] The international system, and humanity as a whole, is in desperate need of order and codified protection

246. *See* Daryl Kimball & Kingston Reif, *The Presidential Nuclear Initiatives (PNIs) on Tactical Nuclear Weapons at a Glance*, ARMS CONTROL ASS'N (July 2017), https://www.armscontrol.org/factsheets/pniglance [https://perma.cc/3QAG-HLZ7].

247. *Id.*

248. *See id.*; *see also* WOOLF, *supra* note 78, summary page ("[N]onstrategic nuclear weapons, have not been limited by past U.S.-Russian arms control agreements.").

249. *Nuclear Weapons*, UNITED NATIONS OFFICE OF DISARMAMENT AFFAIRS (last visited Nov. 7, 2021), https://www.un.org/disarmament/wmd/nuclear/ [https://perma.cc/62BE-28X9] ("nuclear weapons have only been used twice in warfare—in the bombings of Hiroshima and Nagasaki in 1945" and neither of those weapons were tactical nuclear weapons").

250. *See* Kimball & Reif, supra note 246; *cf.* Michael Martina, *China Will Soon Surpass Russia as a Nuclear Threat – Senior U.S. Military Official*, REUTERS (August 27, 2021), https://www.reuters.com/world/china/china-will-soon-surpass-russia-nuclear-threat-senior-us-military-official-2021-08-27/ [https://perma.cc/J7F6-TUCR]. It is important to recognize that China is a growing nuclear threat, and that state has, at times, shown an unwillingness to uphold promises—so while the United States had an oddly amicable understanding of mutually assured destruction with the Soviet Union, the same cannot yet be said of the United States' relationship with China. *Nuclear Weapons*, *supra* note 249 (describing how the United Nations has facilitated a number of treaties between certain countries "'to save humanity'" from " the most dangerous weapons on earth").

beyond the vague, generally accepted Principles of the Law of Armed Conflict.

The Biden Administration is set to finalize its Nuclear Posture Review, the United States' fifth since the end of the Cold War, in early 2022.[251] President Biden was outspoken against President Trump's 2018 review which emphasized bolstering the US nuclear arsenal.[252] Despite that sentiment, many deterrence advocates fear that Biden will continue the trend of modernizing and improving nuclear weapons in the wake of the growing threat of Russian and Chinese nuclear power.[253] If so, the inherent danger of the use of tactical nuclear weapons will grow as the feasibility of use increases and the line between strategic and tactical further blurs.[254]

## *V. CONCLUSION*

Nuclear weapons are the deadliest explosives on the planet.[255] Despite this reality, officials and world leaders are still trying to innovate nuclear weapons to find more tactical uses for them.[256] Recent studies from the Global Securities Lab at Princeton University estimate that use of one tactical nuclear weapon would escalate conflict and lead to over ninety million deaths or injuries within three hours after use.[257] The ICJ recognized that nuclear weapons are a perpetual menace but failed to limit the possibility

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251. Kingston Reif, *Biden Administration Begins Nuclear Posture Review*, ARMS CONTROL ASS'N (September 2021), https://www.armscontrol.org/act/2021-09/news/biden-administration-begins-nuclear-posture-review [https://perma.cc/CMG7-FC98].

252. *Id.*

253. *Id.*

254. *See* Philip Coyle & James McKeon, *The Huge Risk of Small Nukes*, THE AGENDA (Mar. 10, 2017), https://www.politico.com/agenda/story/2017/03/huge-risk-small-nuclear-weapons-000350/ [https://perma.cc/Q3ER-FLBX] (stating that the modernization of nuclear weapons is an extremely dangerous dilemma as exemplified by "the B61 gravity bomb, built to be dropped from an airplane, with a variable yield that can detonate with an explosive force of up to 11 times the force of the Hiroshima blast, or be dialed down to a tiny fraction of that size" because a state subject to the use of this weapon would not know about the disastrous effects until after they occur).

255. *Nuclear Weapons*, *supra* note 249.

256. *See* Narang, *supra* note 80. Delivery systems are an integral part of a nuclear weapon's character, and changing a delivery system blurs the line of tactical and strategic weapons. *See also* WOOLF, *supra* note 78, at 8-9.

257. Ioanes & Mosher, *supra* note 84.

of their use.[258] Evidence since the Court delivered the ICJ Opinion shows that tactical nuclear weapons cannot reconcile the principles of the Law of Armed Conflict.[259] Tactical nuclear weapons are a "militarily irrelevant class of bombs . . . [which] are no longer useful for defense, deterrence, or assurance."[260]

If the ICJ revisited this issue, it should distinguish tactical from strategic nuclear weapons and hold that use of tactical nuclear weapons is *per se* illegal because those weapons cause indiscriminate effects, are unnecessary use of force, inflict superfluous injury, and are almost never proportional. If the Court were to do so, there would finally be a binding international ban on these weapons and the world would no longer rely solely on the promises of individuals. Tactical nuclear weapons are not reliable or convenient as battlefield weapons. They are instruments of mass destruction with uncontainable and disastrous effects. As such, any use, in any scenario, would be a *per se* violation of the Law of Armed Conflict.

258. Nuclear Weapons Advisory Opinion, *supra* note 3, at 266.

259. Notably, the spread of radiation, as well as the considerations discussed in Part IV. Recognizing this incompatibility, and to limit the looming threat of nuclear annihilation, the United Nations began enforcing the Treaty on the Prohibition of Nuclear Weapons on January 22, 2021. Treaty on the Prohibition of Nuclear Weapons, art. 1, Sept. 20, 2017 (the signatories agree to never "[u]se or threaten to use nuclear weapons or other nuclear explosive devices). The nuclear powers are not signatories; *see also* Daryl Kimball & Shannon Bugos, *The Treaty on the Prohibition of Nuclear Weapons At A Glance*, ARMS CONTROL ASSOCIATION (April 2021), https://www.armscontrol.org/factsheets/nuclearprohibition [https://perma.cc/925W-7QAC].

260. This quote was pieced together from an article describing the authors' hopes for discussions at the 2014 NATO Summit in Cardiff, Wales. Hans Kristensen & Adam Mount, *Why NATO Should Eliminate Its Tactical Nukes, Despite Russian Belligerence*, BULLETIN OF THE ATOMIC SCIENTIST (Sept. 3, 2014), https://thebulletin.org/2014/09/why-nato-should-eliminate-its-tactical-nukes-despite-russian-belligerence/ [https://perma.cc/97RY-KCNB].