

**Cross-Domain Effects:**  
**German Unrestricted Submarine Warfare in WWI**

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<b>14. ABSTRACT</b>  This paper examines Germany's February 1917 decision to prosecute unrestricted submarine warfare. It argues that the controversial decision was ultimately wise because of the unconventional nature of submarines and their ability to achieve cross-domain fires, effectively waging psychological warfare in the cognitive sphere of the information domain by using tactical fires in the sea domain. At the point in the war when Germany made this decision, their intractable war aims could only be achieved through bold and swift action that would knock the British out of the war. Submarines were the only capability available to the Germans which could achieve those effects in the time they thought they had available. In the case of World War I, when submarine warfare was in its infancy, it was the cognitive effect in the information domain, not the physical effects of destruction in the sea domain, which held the true seeds of potential German victory.				
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Germany's decision to engage in unrestricted submarine warfare in January 1917 was a wise course of action given the incredibly difficult circumstances they faced at that point in the war and the potential it held for achieving victory through an attack on the United Kingdom's will to fight. Submarine warfare was a relatively new concept at this point in history and its use exposed new possibilities in achieving cross-domain effects when attacks in the sea domain on civilian shipping proved to have cognitive effects in the information domain, all before militaries had the terminology used today to identify these cross-domain interactions. Knowing how events unfolded after February 1, 1917, the eventual German loss of the Great War, and the obvious thread which binds their February 1917 decision to their November 1918 loss certainly complicates the idea that unrestricted submarine warfare could have possibly been a wise decision. The Germans may have ultimately failed, but the choice to prosecute this no holds barred option revealed the submarine's strongest attribute as a weapon of war, its inherent and enduring nature as a cross-domain weapon capable of targeting both national decision makers and the collective psyche of an adversary's population.

A fair examination of the evidence and prevailing professional opinions available to the cadre of German leadership indicates they had legitimate reasons to pin their long sought-after victory against this decision. First, the Germans had positive aims for this war and succumbing to exhaustion before concluding the war would only yield dissatisfactory results at the peace conference. The Entente Powers had to be forced into submission first if Germany hoped to achieve their intentions and that coercion could be achieved through either physical destruction or the net psychological effect. Second, Germany's military leadership had serious doubts about the country's ability to sustain the fight beyond the winter of 1917-18. Unrestricted submarine warfare was a bold strategy which could open an avenue to quick victory through cross-domain

effects and shutting down the UK's will to carry on the fight.<sup>1</sup> Finally, while the Germans were confident this decision would precipitate America's entrance into the war on the Entente side, they had sufficient evidence to reasonably believe this strategy could end the war before the United States could mobilize a sufficient response to impact the outcome of the war.

Given their pre-war geostrategic condition, Germany wanted to achieve some rather ambitious ends before war termination. The Germans understood the exhaustion of all parties with a settlement returning to a pre-war status quo to be a defeat of their positive aims, not simply a draw as others might see it. Considering what the pre-war status quo world looked like from Berlin's perspective makes unrestricted submarine warfare appear far more rational than generally thought. Due to Otto von Bismarck's policies, Germany was only a middling colonial power at the turn of the century and the consensus view was that the consolidation of German power lay on the European continent, not in the colonial ambitions seen in France and Great Britain.<sup>2 3</sup> In 1910, Germany had overtaken Britain as the world's second largest manufacturer,<sup>4</sup> owing in large part to its conquest of Alsace & Lorraine in the Franco-Prussian War which gave rise to the German coal and steel industries<sup>5</sup>—key enablers of any country's war machine in that era and an advantage that must be definitively secured. Furthermore, Germany was fenced into central Europe between two hostile powers, France and Russia. With an interrupted northern coastline, its commerce by sea was subject to the mercies of Great Britain owing to their mastery of the maritime domain and dominating position over Germany's only approaches to the Atlantic and beyond. Therefore, from Berlin's perspective, Germany's national security could only be

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<sup>1</sup> "The Holtzendorff Memorandum on Unrestricted Submarine Warfare," Berlin, December 22, 1916, in *German History in Documents and Images*. Vol. 5: Wilhelmine Germany and the First World War, 1890-1918.

<sup>2</sup> Kagan, Donald. *On the Origins of War and the Preservation of Peace*. New York: Doubleday, 1995. 110-111.

<sup>3</sup> Strachan, Hew. *The First World War*. New York: Viking, 2004. 37.

<sup>4</sup> Strachan, 38.

<sup>5</sup> Kagan, 84.

guaranteed if it could rewrite boundaries and rules for commerce in Europe by dominating the continent and subjugating Belgium and France as economic vassal states with greater access to the English Channel and the Atlantic.<sup>6</sup> Ending the war at a point of mutual exhaustion without achieving those aims, meant remaining in an incredibly insecure geostrategic position and was thought to be disastrous.<sup>7</sup>

The Entente, in turn, had relatively negative aims. The Entente's general intention was to box in Germany and Austria-Hungary, thus checking any continental, expansionist ambitions on their parts and maintaining the pre-war status quo.<sup>8</sup> The primary exception to this was France's ambition to see the return of Alsace & Lorraine to their control due to the regions strong industrial-age natural resources. France's territorial desires here represented a serious concern for the Germans which already precluded the possibility of American-negotiated peace talks proposed by President Wilson in late 1916.<sup>9</sup> Since the Entente's war aims were far less ambitious, their strategy from the beginning had been one of attrition and they could afford to wait the Germans out.<sup>10</sup>

In 1916, faced with a land war strategy that had stalled out far short of victory and a British distant blockade at sea slowly starving the German people, the German war leaders could see their grand war aims slipping out of their hands. If they were going to achieve their ends, Germany required a means by which to bring the Entente powers to the bargaining table first, thereby placing themselves in a position of relative advantage before war termination discussions proceeded. Admiral Holtzendorff recognized that the center of gravity for the British was their

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<sup>6</sup> Bethmann-Hollweg, Theobald von. "The September Memorandum," September 9, 1914, in German History in Documents and Images. Vol. 5: Wilhelmine Germany and the First World War, 1890-1918.

<sup>7</sup> "The Holtzendorff Memorandum on Unrestricted Submarine Warfare."

<sup>8</sup> Strachan, 226.

<sup>9</sup> Strachan, 226.

<sup>10</sup> "Winston S. Churchill: memorandum," December 31, 1914 in Gilbert, Martin, ed. Winston S. Churchill: Companion Volume III, Part I, July 1914-April 1915. Boston: Houghton Mifflin Company, 1973.

maritime capacity, not the Royal Navy's fleet at sea. Unrestricted submarine warfare had the potential to put the Germans on top at war termination if it could deliver victory through an effective cross-domain targeting of British decisionmakers. This could happen, not by defeating the Royal Navy, but rather by undermining confidence in Britain's command of the sea and inherent capability to ensure the safety of trade routes to British ports.<sup>11</sup>

Destroying the alliance by pulling out its linchpin, Great Britain, was the fastest means to end the war and achieve satisfactory results at war termination.<sup>12</sup> The Germans knew that the British were primarily a manufacturing power with little domestic agrarian support to feed their people, relying on imports for 60% of their homeland food consumption.<sup>13</sup> If timed properly, the German's commerce raiding could have a real hope of depleting the British government's stores of wheat through specific destruction of the wheat itself, general destruction of Britain's tonnage capacity in its merchant fleet, and reduction of total imports from trading partners who would be reticent to hitch their fortunes to Britain's sinking fates.<sup>14</sup> Commerce raiding in general would have multiplicative effects on other forms of imports, such as coal and iron, which were also necessary inputs for the British manufacturing which supported the French Army on the continent, thereby also grinding down the Entente's land power capacity.<sup>15</sup> The most important effect, however, would be the net psychological effect within Britain when the people came to believe that the Royal Navy was no longer capable of securing necessary imports, thus knocking out one third of the famed Clausewitzian trinity, the people, and thereby placing another third,

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<sup>11</sup> "The Holtzendorff Memorandum on Unrestricted Submarine Warfare."

<sup>12</sup> "I would, therefore, state it as a principle that if you can vanquish all your enemies by defeating one of them, that defeat must be the main objective in the war. In this one enemy we strike at the center of gravity of the entire conflict." Clausewitz, *On War*, 596-7.

<sup>13</sup> Strachan, 214.

<sup>14</sup> Offer, Avner. *The First World War: An Agrarian Interpretation*. Oxford: Clarendon Press, 1991. 356-357.

<sup>15</sup> "The Holtzendorff Memorandum on Unrestricted Submarine Warfare."

the government, on shaky grounds for continuing the war.<sup>16</sup> The sooner this plan could be enacted, the greater the odds would be of driving British food scarcity to desperate levels, thus increasing the odds of a negotiated peace with the British on German terms.<sup>17</sup> With the British knocked out of the war through starvation, the French and Russians would have little hope of carrying on the war. The commerce raiding strategy was therefore both plausible and wise. It held the means to deliver a conclusive victory for Germany, giving them the best odds of resolving their long-standing national security concerns.

Secondly, German leadership in both the Army and Navy agreed that their country was not in a good position to last another winter in the war, therefore a quick and bold strategy was the last best hope they had for “snatching victory from the jaws of defeat.”<sup>18</sup> Again, the Germans could not afford a return to the pre-war status quo. From Berlin’s point of view, it was their insecure position in status quo that put them on the war path. Ending the war in the same or worse condition would therefore not remove them from the war path. With exhaustion imminent, a strategy that resolved their intransigent requirements quickly was a necessity and unrestricted submarine warfare had the potential to deliver here as well.

Since their aims were positive, the Germans could only hope to achieve them by an offensive.<sup>19</sup> Consider, broadly, Germany’s options to conclude this war through offensive means. Removing Russia from the picture would never end the war, never mind quickly, so the alliance had to be destroyed either on land through removing the French threat, or at sea by removing the British threat. Removing the French on land would only partially satisfy Germany’s

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<sup>16</sup> Clausewitz, Carl von. *On War*. Translated and edited by Michael Howard and Peter Paret. Princeton: Princeton University Press, 1976. 89.

<sup>17</sup> “The Holtzendorff Memorandum on Unrestricted Submarine Warfare.”

<sup>18</sup> Offer, 359.

<sup>19</sup> Corbett, Julian S. *Some Principles of Maritime Strategy*. London: Longman, Green, 1911. Annapolis: Naval Institute Press, reprint, 1988. 31.

requirements. Conquering the French played to Germany's land-based strength and would grant them access to the Atlantic on France's West coast, thus negating the pressure of the British blockade in the North Sea. Regardless, the British would never be satisfied with a unified European continent under one country's control and a war at sea would be likely to carry on. Furthermore, almost 30 months of stalled out trench warfare had disabused the Germans of the notion that some large breakthrough on land, leading to a quick conclusion, was truly possible. Even if the French were close to collapse, there are no historical indications that the Germans could have known this.

Circumstances thus left removing the British from the war as the only potential option that could enable a German victory at all, but especially in consideration of the timeline required by German estimates, before the winter of 1917-18.<sup>20</sup> Facing the British Royal Navy head-on a second time meant risking the High Seas Fleet, the loss of which meant surrendering all trade in the Baltic Sea and would enable British raiding of the German coastline. Its strategic value as a fleet-in-being which kept the Royal Navy from getting close to the German shores was too great to risk on a direct assault. While still a nascent capability, unrestricted submarine warfare held some promise. Both the Germans and the British had proven the submarine's tactical capability in 1915 during previous bouts of unrestricted submarine warfare, with the British destroying half the Turk's over-the-water sustainment between Constantinople and Gallipoli.<sup>21</sup> The German Admiralty staff, advised by civilian economists thought to be experts on the British trade economy, determined that six months of unrestricted submarine warfare would be sufficient to conclude the war. Germany's leadership, therefore, had good reason to believe that a U-boat-centric commerce raiding strategy would strike at the heart of Britain and destroy her ability to

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<sup>20</sup> "The Holtzendorff Memorandum on Unrestricted Submarine Warfare."

<sup>21</sup> Strachan, 120.

continue the fight. While born of some necessity, this type of bold action would allow the Germans to strike “with utmost speed,” thereby fulfilling at least half of Clausewitz’s basic principles for strategic planning.<sup>22</sup> Therefore, though it did not pan out, German leaders had reason to believe that, on-balance, this was the wisest strategy available to them. Unrestricted submarine warfare could deliver the victory they needed, in the time allowable, before their own people gave up the fight.

Finally, the Germans were aware of the risk inherent in their decision. In 1915, when they sank the *Lusitania* and nearly brought the Americans into war, they backed down from unrestricted submarine warfare.<sup>23</sup> Obviously, the Germans were leery about the American entrance into this war. Even still, they maintained some reasonable expectations that the Americans could remain a non-factor long enough for this strategy to achieve its intended result.

In August of 1914, there were strong indications that the United States Navy was unprepared to engage in the European war in a meaningful fashion, suffering from lack of training, running disparate operations and lacking experience in working as a fleet, and fighting a flagging morale.<sup>24</sup> Despite frequent protestations by the Navy’s top brass, Admirals Fiske and Benson, President Wilson maintained a policy of strict neutrality. This policy severely delayed the Navy’s ability to prepare for war, out of fear that any change in posture might be misinterpreted by any one of the war’s belligerents, thereby compromising the United States’ neutrality and ability to negotiate a favorable peace settlement.<sup>25</sup> The Germans would have known much of this and therefore can be thought to have simply accepted prudent risk.

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<sup>22</sup> Clausewitz, 617.

<sup>23</sup> Strachan, 223-224.

<sup>24</sup> Baer, George W. *One Hundred Years of Sea Power: The U.S. Navy, 1890-1990*. Stanford: Stanford University Press, 1994. 55.

<sup>25</sup> Baer, 55

Interestingly, Holtzendorff indicated that the Germans had reason to expect they could delay the American arrival as well.<sup>26</sup> While details are scarce, the Germans had previously pulled off a successful sabotage effort at Black Tom Pier, Jersey City, NJ in June 1916 and perhaps he knew of additional plans in this vein.<sup>27</sup> Additionally, German Foreign Minister Arthur Zimmerman was busy attempting to pull Mexico into war against the United States as a strategic distraction which might force America to focus her military efforts at home. Regardless, German leadership had reason to believe that as slow as the American entrance might be due to lack of preparedness and prior intent, they may yet be delayed further still.

Offer, Strachan, and Baer assert that the German decision to implement unrestricted submarine warfare in 1917 was a foolish act of desperation, not a judicious decision arrived at from the sage counsel of Generals, Admirals, and Statesmen. After all, the numbers were clearly not in their favor and the move would hasten an American entrance into the war which would compound the problem that time was, in fact, not on Germany's side. These arguments have merit and are worthy of further consideration.

Offer provides the economic argument that "even under the best possible assumptions, the figures did not add up."<sup>28</sup> By the German's initial calculations, destroying approximately 667,000 tons a month for six months would be sufficient to bring Britain to her knees. And this they almost did, with an average of 643,000 tons destroyed in that time frame.<sup>29</sup> This destruction represented approximately 25% of British maritime shipping capacity at that time, and yet the British showed no *outward* signs of buckling. It might appear then that the German economists got the numbers wrong. Complicating this matter, the Germans had no way of accurately

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<sup>26</sup> "The Holtzendorff Memorandum on Unrestricted Submarine Warfare."

<sup>27</sup> Strachan, 224.

<sup>28</sup> Offer, 359

<sup>29</sup> Offer, 358.

identifying which ships carried wheat, the actual critical vulnerability Germany sought to attack. Meanwhile, Strachan and Baer's contentions focus more on the inevitability of America's entrance to the war. While the Germans faced significant troubles sustaining the war without also fighting the Americans, a provocation of this kind, they argue, could only serve to hasten Germany's defeat. America was not only the world's largest manufacturing power,<sup>30</sup> but they were the largest neutral left to enter the fray, they had been almost entirely unscathed by the ravages of war and could bring large amounts of fresh troops to bear both on land and at sea. The extent to which Offer, Strachan, and Baer's arguments are convincing is primarily because the outcome is already known. Clausewitz's dictum on critical analysis would suggest this is a poor point of entry into arguing against the German strategy.<sup>31</sup>

Admittedly, the Germans backed their way into a solution based on some weakly supported assumptions and questionable analytics. Offer also took an academic approach to the problem the Germans faced and arrived at the conclusion that Germany's means were insufficient to achieve the ends intended by unrestricted submarine warfare. Nevertheless, the reality is that this is a case where the science of war has obscured its art. The German unrestricted submarine warfare decision was never truly about the numbers, it was always about perceptions. The Germans could have destroyed all 20mil tons of British shipping capacity and still lost the war if it took too long to accomplish. Conversely, had they been able to destroy the same 4mil tons in only two months instead of six, it might have proven to the British people that the Royal Navy had lost its maritime supremacy. If the large and expensive fleet they relied upon

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<sup>30</sup> Strachan, 35 & 38.

<sup>31</sup> "If the critic wishes to distribute praise or blame, he must certainly try to put himself exactly in the position of the commander; in other words, he must assemble everything the commander knew and all the motives that affected his decision, and ignore all that he could not or did not know, especially the outcome." Clausewitz, *On War*, 164.

to feed their people proved incapable of securing this vital trade function, the British public might have been relied upon to force their government out of the war. When U.S. Navy RADM Sims arrived in London to assess the situation, he was met by the First Sea Lord, Admiral Jellicoe, with the grim news that the German strategy was thought to be working and that the British would in fact soon starve. Even worse, Jellicoe saw no way out of the predicament. In February and March 1917, the Germans had destroyed, or scared off, approximately 75% of commerce from reaching British ports that had arrived during the same period the year prior. With only 40 submarines, the Germans were completely subverting the world's most powerful navy.<sup>32</sup> This was the perception the U-boat campaign was aimed at creating. The true target was never the wheat and it was never the merchant tonnage, it was the will of the British people to keep up the fight. Kill their spirit and you end the war.<sup>33</sup>

Additionally, when the United States passed the Naval Bill of 1916, the country still had not envisioned itself entering into the current war, and thus had passed legislation that was preparing the Navy to fight future wars in 1925 and beyond, not the one presently raging across the Atlantic.<sup>34</sup> The bill's focus was on battleships, sufficient destroyers to protect those battleships, and lacked any troop transport vessels.<sup>35</sup> In this, the Germans would notice an underwhelming current American capacity to fight against U-boats and, by reading between the lines, that America had little interest in preparing to launch an Army across the Atlantic. The American Navy was preparing to fight another Jutland, not to combat commerce raiding and deploy an army. Here, the Germans had sufficient evidence to believe it would take the

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<sup>32</sup> Baer, 67.

<sup>33</sup> Clausewitz, 259.

<sup>34</sup> Baer, 59-60.

<sup>35</sup> Baer, 60.

Americans enough time to shift focus and mobilize a war effort that the speed Germany's strategy offered would settle the matter before the Americans were of any real consequence.

Finally, the Americans extended stint of strict neutrality hinted that American aims for prosecuting the war would be different than that of the Alliance, leading to disunity in their response and dissipating the effect of the power they would bring to bear. To be certain, America would make a formidable enemy, but in responding from outside the established alliance its power would not concentrate effectively with the Entente. This actually proved to be the case at sea. While America's response had 35 of its 52 destroyers in European waters by July,<sup>36</sup> American destroyers would only account for 5% of sunk U-boats by war's end.<sup>37</sup> Furthermore, the Americans disagreed with British strategy of convoys and sought to canalize the German U-boat traffic via minefields.<sup>38</sup> This was an inconsequentially expensive effort that began too late and only netted, at most, six U-boat kills in the 18 months or so of unrestricted submarine warfare.<sup>39</sup>

The truth is Germany's unrestricted submarine warfare was a sound strategy that failed in tactical execution. The strategic boldness of the action was matched with tactical competence, but not tactical genius. The U-Boat commanders accomplished for six months almost exactly what was asked of them in destruction of tonnage, but no more. This reveals a problem with introducing too much science into the art of war, Commanders likely sought to achieve their numbers but were unwilling to accept additional risk to exceed what was asked of them. When the British adapted their merchant tactics to convoying, the Germans failed to respond with innovation or additional boldness to again strike more deeply at the British psyche. Wolfpack

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<sup>36</sup> Baer, 71.

<sup>37</sup> Baer, 77.

<sup>38</sup> Baer, 74.

<sup>39</sup> Baer, 75.

tactics, concentrating multiple submarines to hunt together, might have been sufficient to defeat the British convoy system, but the Germans would not fully develop this bolder tactic until WWII.<sup>40</sup> The Germans had thrown the British off balance, but the Germans failed to follow up with additional blows and thus gave the British time to recover.<sup>41</sup>

Perhaps the most interesting lesson to be learned from studying Germany's fateful February 1917 decision is not the old trope, "desperate times call for desperate measures," but rather the revelation about the nature of submarines as a weapon of greater threat and effect in the cognitive portion of the information domain than perhaps they are in the sea domain in which they physically operate. In this light, we can see that submarines were in fact strategic assets long before countries began arming them with nuclear weapons. Submarines, though a nascent and niche capability, were of vast importance because they gave German national leadership a strategic option that no other weapon system at that time could provide. In July 1917, submarines firing for tactical effect on merchant ships in the Atlantic were also achieving strategic psychological effects on national decisionmakers, like Admiral Jellicoe.

Since the 1960s, when the United States developed the nuclear Triad, submarines have been a critical part of national strategies.<sup>42</sup> Throughout much of the Cold War, the United States completely misunderstood the USSR's strategic missile submarine strategy and was forced to dedicate a significant amount of national intelligence enterprise effort over a span of decades simply to identify patterns of use and gain an adequate understanding of Soviet intentions.<sup>43</sup>

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<sup>40</sup> Baer, 77.

<sup>41</sup> "If the enemy is thrown off balance, he must not be given time to recover. Blow after blow must be aimed in the same direction... constantly seeking out the center of his power, by daring all to win all, will one really defeat the enemy." Clausewitz, *On War*, 596.

<sup>42</sup> Office of the Secretary of Defense Nuclear and Missile Defense Policy, "The Importance of the Nuclear Triad," United States Department of Defense: Washington D.C., November 2020, 1.

<sup>43</sup> Ford, Christopher A. & David A. Rosenberg, "The Naval Intelligence Underpinnings of Reagan's Maritime Strategy," *The Journal of Strategic Studies* vol. 28, no. 2 (April 2005): 379-409.

Simply by possessing nuclear armed submarines, the Soviets forced the United States' national leadership to burn limited resources in consideration of their threat. The possibility that Soviet submarines could potentially target the United States famously had a profound effect on the American psyche during the Cold War era when fallout shelters and nuclear bomb drills in elementary schools were commonplace. Submarines, especially modern nuclear-armed ones, are notoriously difficult to track and are highly survivable.<sup>44</sup> Even when their portion of a nation's fleet is relatively small, the threat they represent demands that strategic decisionmakers consider how an adversary will employ them, thus shaping strategic plans, national policy, and even public behaviors. The modern use of SSBNs in deterrent patrols recognizes the value of submarines as a psychological weapon which disrupts adversary decision making by presenting multiple dilemmas across every level of war.

Contrary to popular belief, Germany's 1917 unrestricted submarine warfare strategy was perfectly rational and wise given their ambitious aims and the dearth of viable options to achieve those intractable ends which could guarantee their future national security in a speedy manner. Prominent critics of this strategy offer arguments that ignore key issues, such as the battle of perceptions, and have failed to offer plausible alternatives that Germany might have pursued to still achieve their war aims. In the case of World War I, when submarine warfare was in its infancy, it was the cognitive effect in the information domain, not the physical effects of destruction in the sea domain, which held the true seeds of potential German victory. While the unrestricted submarine warfare strategy always had a low probability of success, and the Germans knew this,<sup>45</sup> its unconventional targeting capability made it the wisest of all available

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<sup>44</sup> Office of the Secretary of Defense Nuclear and Missile Defense Policy, "The Importance of the Nuclear Triad," United States Department of Defense: Washington D.C., November 2020, 6.

<sup>45</sup> "The Holtzendorff Memorandum on Unrestricted Submarine Warfare."

alternatives. What was true in 1917 has remained true through to modern times, submarines are a powerful cross-domain weapon system and their potential psychological effect on an adversary must remain a consideration in their employment.