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**PRECISION GUIDED MUNITIONS AND THE LAW OF  
WAR**

**By**

**Mr Danielle L. Gilmore**

## **About the Author**

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## INTRODUCTION

In the early days of 17 January 1991, the United States along with other Coalition forces launched an air campaign against Iraq and the Iraqi troops that had invaded neighbouring Kuwait.<sup>1</sup> The Persian Gulf War would prove to be a war unlike any other. The Gulf War was the first war in which air power and aerial bombardment<sup>2</sup> was to almost exclusively decide the outcome; it was also the first war in which precision-guided munitions (PGMs) would prove their capabilities.<sup>3</sup>

In the last three decades, lethal strike aircraft with the capability of attacking with pinpoint accuracy were developed. Operation Desert Storm demonstrated these technological advances. The aircraft were used in the air campaign against Iraq, dropping both precision-guided, or “smart” bombs, and “dumb” bombs. “Smart” bombs carry laser, electro-optical, or infrared guiding systems that keep them on course towards their targets.<sup>4</sup> “Dumb” bombs, however, have no guiding systems and therefore are usually not as accurate as “smart” bombs.<sup>5</sup> Although precision-guided bombs accounted for only 8.8% of all ordnance delivered in Desert Storm,<sup>6</sup> their success in minimizing civilian casualties and collateral damage was widely publicised. Films of laser-guided bombs speeding unerringly through ventilation shafts and doorways provided stunning images of the effectiveness of precision-guided bombs.<sup>7</sup> The success of precision-guided missiles had led at least one non-governmental organisation, Middle East Watch, to argue that the law of war requires the use of only the most discriminating weapons in populated areas.<sup>8</sup> This group, and others, however, have failed to recognize that the law of war does not require the use of PGMs in all circumstances.

The air campaign goals of Desert Storm were to incapacitate the Iraqi regime by attacking command and control centers, to gain and maintain air supremacy, to eliminate Iraq’s offensive military capability, and to render the Iraqi army in Kuwait

<sup>1</sup> See Rosenthal, Andrew, *US and Allies Open Air War on Iraq; Bomb Baghdad and Kuwaiti Targets; ‘No Choice’ But Force, Bush Declares: No Ground Fighting Yet; Call to Arms by Hussein*, NY Times, 17 Jan 1991, at A1.

<sup>2</sup> The Air Force has described aerial bombardment as the ‘dropping [of] munitions from manned or unmanned aircraft, strafing, and using missiles or rockets against enemy targets on land’. US Dept of the Air Force, Air Force Pamphlet 110-31, *International Law - The Conduct of Armed Conflict and Air Operations 5-1* (1976) [hereinafter AFP 110-31].

<sup>3</sup> For purposes of this Note, PGMs refer to the type of ‘smart’ weapons used by the Coalition forces in the Persian Gulf War. These ‘smart’ weapons mainly utilised laser guidance systems while some had electro-optical (television) or imaging infrared guidance. See William M. Arkin et al, *On Impact: Modern Warfare and the Environment, A Case Study of the Gulf War* app. A, at A-1 (1991). Eight types of guided bombs were used by US forces. *Id.* For a list and discussion of the weapons used in the air war, see *id.* app. A, at A-1 to A-5.

<sup>4</sup> *Id.*, app. A, at A-1; see also Elting, John R. et al, *A Dictionary of Soldier Talk*, p 292 (1984) (defining ‘smart bomb’); Luttwak, Edward & Koehl, Stuart, *The Dictionary of Modern War*, p 468, 1991, (defining ‘precision-guided munitions’).

<sup>5</sup> Elting et al, *supra* note 4, at 98.

<sup>6</sup> See Arkin et al, *supra* note 3, at 78 (stating that about 22,000 of 250,000 bombs dropped were guided).

<sup>7</sup> Capps, Alan P., ‘Brute Force in the Gulf’, *Def. & Dipl.*, May/June 1991, at 24.

<sup>8</sup> See Middle East Watch, *Needless Deaths in the Gulf War*, p 126 (1991) [hereinafter Middle East Watch].

ineffective.<sup>9</sup> In addition, a key principle of the Coalition strategy was to minimize civilian casualties and collateral damage.<sup>10</sup>

Coalition air-strikes were designed to be as precise as possible. Military planners spared legitimate military targets to minimize civilian casualties.<sup>11</sup> For example, the Coalition often chose not to attack military targets because they were in populated areas or adjacent to cultural sites.<sup>12</sup> Although the Coalition conducted the most discriminate military campaign in history, some collateral damage and injury did occur.<sup>13</sup> It is important to note, however, that civilians were injured and civilian objects damaged largely because the Iraqi Government located military assets, such as personnel, weapons, and equipment, in heavily populated sections and neighbouring protected objects, such as mosques, hospitals and historical sites,<sup>14</sup> thereby violating the law of war. Iraq also caused civilian casualties and collateral damage to its population and property with its own air defenses.<sup>15</sup> Iraq relied on this damage to convey “the misimpression that the Coalition was targeting populated areas and civilian objects”.<sup>16</sup> Under the current law of war, however, the Coalition's bombing of legitimate Iraqi military targets was lawful, regardless of whether a precision-guided missile or a traditional dumb bomb caused collateral injury and damage.

This Note first explores the law of war applicable to Operation Desert Storm. Next, this Note discusses the PGMs used in Desert Storm as well as the advantages and disadvantages of their use. Finally, this Note applies the relevant law of war principles to the use of PGMs in Desert Storm. Application of the law of war reveals that the use of precision-guided missiles is left to the discretion of the attacker. Their use cannot be compelled for two main reasons. First, the law of war has traditionally placed primary responsibility for the protection of the civilian population on the defender, not the attacker. Second, precision-guided missiles are not always the best weapon to use. They are extremely susceptible to the environment, and, in some instances, they can cause more collateral damage than a conventional bomb.

## **LAW OF WAR APPLICABLE TO OPERATION DESERT STORM<sup>17</sup>**

The Persian Gulf War was governed by customary international law,<sup>18</sup> the 1907 Hague Convention IV<sup>19</sup> and IX<sup>20</sup> Regulations, the 1949 Geneva Conventions,<sup>21</sup>

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<sup>9</sup> US Dept of Defense, *Conduct of the Persian Gulf War: Final Report to Congress*, p 125-26 (1992) [hereinafter Pentagon Final Report].

<sup>10</sup> *Id.*, at 131.

<sup>11</sup> *Id.*, app. 0, at 0-10.

<sup>12</sup> *Id.*, app. 0, at 0-12.

<sup>13</sup> *Id.*, app. 0, at 0-10.

<sup>14</sup> *Id.*, app. 0, at 0-11 to 0-12.

<sup>15</sup> *Id.*, app. 0, at 0-12.

<sup>16</sup> *Id.*

<sup>17</sup> See generally, Parks, W. Hays, ‘Air War and the Law of War’, *32 Air Force Law Review Revision 1*, pp 89-168 (1990) (discussing the law of war relating to aerial bombardment in World War II and changes to that law of war in the 1970s and early 1980s).

<sup>18</sup> ‘Customary law is found in the practice of states, how many is not precisely stated[,] ... which is binding upon all persons of international law irrespective of treaty commitments.’ Hilaire McCoubrey, *International Humanitarian Law: The Regulation of Armed Conflicts*, p 192 (1990).

United Nations Resolution 2444<sup>22</sup> and the 1954 Hague Convention for Protection of Cultural Property in the Event of Armed Conflict.<sup>23</sup> The main thrust of the law of war in effect during Desert Storm was that the primary responsibility for the protection of civilian persons or objects lay with the defender, not the attacker. This was because the international community had acknowledged that the defending nation has the best ability to control civilian persons and objects. The inevitability of incidental collateral damage was also acknowledged; thus the applicable treaties discouraged the positioning of legitimate military targets in and around the civilian population.<sup>24</sup>

<sup>19</sup> Hague Convention IV Respecting the Laws and Customs of War on Land, 18 Oct 1907, [hereinafter *1907 Hague Convention IV*]; see also Adam Roberts & Richard Guelff (eds) *Documents on the Law of War*, pp 43-59 2nd edition, 1989, (providing background information and the text of the Convention).

<sup>20</sup> Hague Convention IX Concerning Bombardment by Naval Forces in Time of War, 18 Oct 1907. [hereinafter *1907 Hague Convention IX*]; see also *Documents on the Laws of War*, supra note 19, at 93-99 (providing background information and the text of the Convention).

<sup>21</sup> The 1949 Geneva Conventions are comprised of: (1) Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in the Armed Forces in the Field, opened for signature 12 Aug 1949, [hereinafter *Geneva Convention I*]; (2) Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, opened for signature 12 Aug 1949, [hereinafter *Geneva Convention II*]; (3) Geneva Convention Relative to the Treatment of Prisoners of War, opened for signature 12 Aug 1949, [hereinafter *Geneva Convention III*]; (4) Geneva Convention Relative to the Protection of Civilian Persons in Time of War, opened for signature 12 Aug 1949, [hereinafter *Geneva Convention IV*]; see also *Documents on the Law of War*, supra note 19, at 169-337 (providing background information and the text of the 1949 Geneva Convention).

<sup>22</sup> G.A. Res. 2444, UN GAOR, 23rd Sess, Supp No 18, at 50, UN Doc A/7218 (1969) [hereinafter *Resolution 2444*].

<sup>23</sup> Convention for the Protection of Cultural Property in the Event of Armed Conflict, 14 May 1954, [hereinafter *1954 Hague Convention*]; see also *Documents on the Laws of War*, supra note 19, at 339-62 (providing background information and the text of the 1954 Hague Convention).

<sup>24</sup> The law of war evolved as a result of the desire to minimise injury to civilians in times of conflict. The principle of distinguishing between combatants and noncombatants was not accepted immediately. See Jean Pictet, *Development and Principles of International Humanitarian Law*, p 51 (1985). It has been accepted through the centuries that 'war brought into conflict not only states and their armies, but also their peoples'. *Id.* The concept of keeping the civilian population protected from the battle emerged in the 16th century but did not become established until the 18th century. See *id.* at 52. One of the first glimpses of concern for the civilian population and collateral damage came with the Just War Doctrine, developed by the Catholic Church during the Crusades which accepted the necessity of going to war for a just cause. See Waldemar A. Solf, 'Protection of Civilians Against the Effects of Hostilities Under Customary International Law and Under Protocol I', *IAM UJ Int'l L & Pol'y* 117, p 119 (1986). "Realising that collateral casualties among the innocent must be expected, theologians recognised the rule of 'double-effect', distinguishing intended killing of combatants from unintended, accidental killings of civilians." *Id.* The Just War Tradition and the law of war allow for attacks on combatants even though civilians may be injured or killed, so long as the civilian casualties are indirect and unintentional and the attack is of an otherwise lawful target. See Parks, supra note 17, at 4. Additionally, two other conditions are important. First, civilians lose 'their right of protection from intentional injury if they carry out actions in favour of one belligerent over another'. *Id.* Second, in the attack of a city, injury or death to civilians within the city is 'regarded as permissible in that it create[s] a burden on the besieged commander, or because it is his responsibility as a result of his refusal to surrender'. *Id.* 'The Napoleonic War and the French Revolution put an end to the era of limited warfare. Thereafter, ... [t]he entire population was mobilised for the war effort, blurring the distinction between combatants and civilians, putting great strain on the customary law of war.' Solf, supra, at 120. The activation of mass armies created the need for precise rules to govern their conduct. *Id.* War became nations fighting each other, not simply individual soldiers fighting one another. '[I]t had become a national effort. Able-bodied men were conscripted for military service, while all others, men, women, and children, assumed other responsibilities to support the war effort. And it was into this changing environment of war that international lawyers stepped to devise the modern law of war.' Parks, supra note 17, at 7.

## 1907 Hague Convention IV Respecting the Laws and Customs of War on Land

The 1907 Hague Convention IV Respecting Laws and Customs of War on Land<sup>25</sup> (1907 Hague Convention IV) followed the 1899 Hague Convention II Respecting the Laws and Customs of War on Land<sup>26</sup> (1899 Hague Convention II). The 1899 Hague Convention II was the first time the international community successfully codified a relatively comprehensive set of laws governing land warfare.<sup>27</sup> “Hague” law refers primarily to the rules governing the means and methods of warfare.<sup>28</sup>

The 1907 Hague Convention IV was intended to replace the 1899 Hague Convention II, but “was not regarded as a complete code of the applicable law”.<sup>29</sup> The preamble to the 1907 Hague Convention IV states that cases not included in the Regulations annexed to the Convention remain governed by the customary international law relating to the conduct of warfare.<sup>30</sup>

Articles 25 and 27 of the 1907 Hague Convention IV are applicable to air warfare. Article 25 states that “[t]he attack or bombardment, by whatever means, of towns, villages, dwellings or buildings which are undefended is prohibited”.<sup>31</sup> Typically, a place is considered undefended if it is in the zone of operations and could be occupied by an adverse party without resistance.<sup>32</sup> Article 27 states that “[i]n sieges and bombardments all necessary steps must be taken to spare, as far as possible, buildings dedicated to religion, art, science, or charitable purposes, historic monuments, hospitals, and places where the sick and wounded are collected, provided they are not being used at the same time for military purposes”.<sup>33</sup>

The main premise of the 1907 Hague Convention IV was that “[t]he right of belligerents to adopt means of injuring the enemy is not unlimited”.<sup>34</sup> While it provided that the civilian population could not be the direct object of attack, it also excused the attacker of responsibility for “unavoidable” collateral damage, which was a codification of customary international law.<sup>35</sup> Collateral civilian casualties were considered as part of the price of war and not the responsibility of the attacker.<sup>36</sup> The attacker was virtually relieved of any responsibility for collateral damage or injury unless it occurred as a result of indiscriminate bombing.<sup>37</sup> Responsibility for such

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<sup>25</sup> 1907 Hague Convention IV, supra note 19.

<sup>26</sup> Convention with respect to the Laws and Customs of War on Land, 29 July 1899. See generally *Documents on the Laws of War*, supra note 19, at 43-44 (discussing the 1899 Hague Convention II).

<sup>27</sup> See *Documents of the Laws of War*, supra note 19, at 43.

<sup>28</sup> See McCoubrey, supra note 18, at 145.

<sup>29</sup> *Documents on the Laws of War*, supra note 19, at 44.

<sup>30</sup> 1907 Hague Conventions IV, supra note 19.

<sup>31</sup> Id, art 25, 36, see also Hamilton DeSaussure, ‘The Laws of Air Warfare: Are There Any?’, *12 AF JAG L Rev* 242, p 243 (1970) (discussing Article 25 of the 1907 Hague Convention IV and explaining that it was drafted specifically to include attacks by air).

<sup>32</sup> See US Dept of the Army, Department of the Army Field Manual FM 27-10, *The Law of Land Warfare 4* (1956) [hereinafter *Army Field Manual*]; De Saussure, supra note 31, at 243-44. An undefended target may be attacked, however, as long as the target serves a military purpose for the defender. See Parks, supra note 17, at 17-18.

<sup>33</sup> 1907 Hague Convention IV, supra note 19, art 27.

<sup>34</sup> Id art 22.

<sup>35</sup> See Parks, supra note 17, at 18.

<sup>36</sup> See id.

<sup>37</sup> See id at 20.

collateral damage or injury was viewed as laying primarily with the defender because of its superior ability to control the civilian population.<sup>38</sup> The civilian population, however, was also expected to take on some of the responsibility.<sup>39</sup> Based upon these principles, it is clear that the obligation for minimizing collateral civilian casualties or damage to civilian objects were considered a shared obligation of the attacker, the defender, and the civilian population.<sup>40</sup>

Often, injury cannot be attributed to any one party, but instead to a variety of factors. For example, when a defender uses its anti-air weapons against an attacking force carrying out a lawful attack on a legitimate object, the anti-aircraft weapon itself, the attacking aircraft, or its bomb, may cause severe damage to civilian objects or to the civilian population.<sup>41</sup> As a result, by using anti-air defenses, a defender places its own civilian population at risk.<sup>42</sup> In this case, responsibility for collateral damage, injury, or death usually will be shared by all parties, or may be attributable to the confusion of war.<sup>43</sup>

### **1907 Hague Convention IX Concerning Bombardment by Naval Forces in Time of War**

The 1907 Hague Convention IX Concerning Bombardment by Naval Forces in Time of War<sup>44</sup> (1907 Hague Convention IX) is the only law of war treaty which, while incomplete in view of increased technology and modes of warfare, contains a list of lawful targets.<sup>45</sup> Article 2 lists as lawful targets, “[m]ilitary works, military or naval establishments, depots of arms or war material, workshops or plant [sic] which could be utilized for the needs of the hostile fleet or army, and the ships of war in the harbour”.<sup>46</sup> This language indicated that lawful targets are not exclusively military objects, but also industrial targets of value to the enemy war effort.<sup>47</sup> The Article 2 list was regarded by the United States as declaratory of customary international law as it existed in 1907,<sup>48</sup> but can no longer be recognized as exhaustive. Other modern targets, such as communication systems, may also be legitimate military targets under the 1907 Hague Convention IX.<sup>49</sup>

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<sup>38</sup> See *id.*

<sup>39</sup> See *id.* at 29. If civilians live near a munitions factory, for example, they should move to a shelter during wartime, see *id.*, as a munitions factory is a legitimate target. See 1907 Hague Convention IX, *supra* note 20, art 2.

<sup>40</sup> See Parks, *supra* note 17, at 28-29.

<sup>41</sup> See *id.*, at 29.

<sup>42</sup> See *id.*

<sup>43</sup> See *id.* [T]here is an assumption that responsibility for incidental damage or injury always can be attributed to someone; yet when an attacking force is carrying out a lawful attack on a legitimate target, and the defender is using its anti-air capabilities lawfully to defend targets, responsibility for collateral damage, injury, or death will usually be shared, or may be attributable only to the fog of war. In many cases the actions of the attacker may be consistent with the law of war, yet actions of the defender will cause the attack to result in collateral civilian casualties. The actions of the defender are an intervening cause for which the attacker is not responsible.

<sup>44</sup> 1907 Hague Convention IX, *supra* note 20.

<sup>45</sup> See *Documents on the Laws of War*, *supra* note 19, at 93-94; Parks, *supra* note 17 at 18.

<sup>46</sup> 1907 Hague Convention IX, *supra* note 20, art 2.

<sup>47</sup> See Parks, *supra* note 17 at 18.

<sup>48</sup> See James B. Scott (ed) *Carnegie Endowment for Intl Peace, Instructions to the American Delegates to the Hague Peace Conferences and their Official Reports* 112, 1916.

<sup>49</sup> See AFP 110-31, *supra* note 2, at 5-9; *Documents on the Laws of War*, *supra* note 19, at 94.

Additionally, the treaty served to absolve the attacker of responsibility for incidental and unavoidable collateral damage. As in the 1907 Hague Convention IV, this codified customary international law.<sup>50</sup> Articles 5 and 6 directly address this issue. Article 5 states, “[I]n bombardments by naval forces all the necessary measures must be taken by the commander to spare as far as possible sacred edifices, buildings used for artistic, scientific, or charitable purposes, historic monuments, hospitals and places where the sick and wounded are collected, on the understanding that they are not used at the same time for military purposes”.<sup>51</sup> Article 6 states that “[i]f the military situation permits, the commander of the attacking naval force, before commencing the bombardment, must do the utmost to warn the authorities”.<sup>52</sup> Therefore, the attacker is not responsible for collateral damage for failure to warn where the military situation does not permit the attacker to warn.

### **The 1949 Geneva Convention**

World War II demonstrated the diversity of aircraft. It also resulted in an excess of collateral civilian injury. During and after the war, it became clear that “[t]he principles embodied in the Hague Regulations were clearly insufficient [as to enemy civilians in occupied territory], and the need to adopt an international agreement for the protection of civilians in time of war became apparent”.<sup>53</sup> Unlike the 1907 Hague rules, which set out the guidelines for conducting war, the Geneva Convention rules were designed to protect the victims of war and, as a result, have little to do with the way in which war is conducted and weapons are used.<sup>54</sup> The 1949 Geneva Conventions consisted of four treaties that codify humanitarian principles related to war victims. They included the 1949 Geneva Convention I for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field;<sup>55</sup> the 1949 Geneva Convention II for the Amelioration of the Condition of the Wounded, Sick and Shipwrecked Members of Armed Forces at Sea;<sup>56</sup> the 1949 Geneva Convention III Relative to the Treatment of Prisoners of War;<sup>57</sup> and the 1949 Geneva Convention IV Relative to the Protection of Civilian Persons in Time of War.<sup>58</sup> The 1949 Geneva Conventions have been ratified universally, including all parties involved in the Persian Gulf War.<sup>59</sup> Their application was triggered by the Iraqi invasion of Kuwait on 2 August, 1990.<sup>60</sup>

The 1949 Geneva Conventions expand the general protections to civilians in occupied territory enunciated in the 1907 Hague Convention IV. The 1949 Geneva Conventions were created because of the insufficiency of previous international agreements

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<sup>50</sup> See Parks, *supra* note 17 at 18.

<sup>51</sup> 1907 Hague Convention IX, *supra* note 20, art 5, (emphasis added).

<sup>52</sup> *Id* art 6.

<sup>53</sup> *Documents on the Laws of War*, *supra* note 19 at 271.

<sup>54</sup> See William G. Schmidt, ‘The Protection of Victims of International Armed Conflict: Protocol I to the Geneva Convention’, 24 *Air Force Law Review* 189, p 193 (1984).

<sup>55</sup> Geneva Convention I, *supra* note 21.

<sup>56</sup> Geneva Convention II, *supra* note 21.

<sup>57</sup> Geneva Convention III, *supra* note 21.

<sup>58</sup> Geneva Convention IV, *supra* note 21.

<sup>59</sup> See Pictet, *supra* note 24 at 39; *Pentagon Final Report*, *supra* note 9, app O, at 0-3.

<sup>60</sup> See *Pentagon Final Report*, *supra* note 9, app O at 0-4.



regarding the rights of the civilian population and the obligations of belligerents towards civilians.<sup>61</sup>

The Geneva Convention IV was the first international agreement to concentrate solely on civilian protection.<sup>62</sup> Article 4 defines a person protected by the Convention as anyone who, during a conflict or occupation, is “in the hands of a Party to the conflict or Occupying Power of which they are not nationals”.<sup>63</sup> Under Article 5 any person suspected of, or engaged in, activities hostile to the security of the state will not be afforded civilian protection.<sup>64</sup> These persons include military troops as well as civilians taking up arms on their own.<sup>65</sup> Therefore, the defender must prohibit belligerent acts by its civilian population in order for them to receive the protection afforded civilian populations.<sup>66</sup> In this sense, the Geneva Convention provisions place responsibility for minimizing collateral damage not only with the attacker, but also with the defender.<sup>67</sup>

### **Customary International Law - Protocol I Additional to the Geneva Conventions of 12 August 1949**

Protocol I to the 1949 Geneva Conventions<sup>68</sup> (Protocol I), drafted in 1977, was an effort to bring the Hague rules up to date.<sup>69</sup> Although several attempts were made prior to 1977 to update the 1907 Hague Conventions, “governments, particularly those of the industrialised major military powers, tended to resist these codification efforts, clearly preferring custom as the vehicle for change. This preference doubtless reflected concern that codification would be more likely to result in unrealistic restrictions that would prove unacceptable in practice”.<sup>70</sup> Neither the United States nor Iraq elected to become a party to Protocol I because they viewed it as containing too many military restrictions not conducive to the dynamics of warfare.<sup>71</sup> Therefore, it was not applicable to the Persian Gulf War. Protocol I, however, codified important aspects of customary international law that were binding in the Persian Gulf War, namely the concepts of proportionality and military necessity.

#### ***Proportionality***

Protocol I was the first codification of the customary international law concept of proportionality.<sup>72</sup> Proportionality is the principle that although military objectives may be attacked with incidental injury or damage to civilians or property, any incidental

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<sup>61</sup> See *Documents on the Laws of War*, supra note 19, at 271.

<sup>62</sup> See id., at 271.

<sup>63</sup> Geneva Convention IV, supra note 21, art 4.

<sup>64</sup> Id art 5.

<sup>65</sup> See Parks, supra note 17, at 118.

<sup>66</sup> See id.

<sup>67</sup> See id., at 57-59.

<sup>68</sup> Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts, adopted 8 June 1977, [hereinafter Protocol I].

<sup>69</sup> See George H. Aldrich, ‘New Life for the Laws of War’, *75 Am J Int’l L* 764, p 777 (1981).

<sup>70</sup> Id.

<sup>71</sup> See Protocol I, supra note 17, at 94-168.

<sup>72</sup> See Protocol I, supra note 68, art 51, paragraph 5(b), art 57, paragraph 2(a)(iii), at 26, 29, *Middle East Watch*, supra note 8, at 41; Parks, supra note 17, at 170-71.

injury or damage must not be disproportionate to the military advantage gained.<sup>73</sup> In addition, attackers must take all reasonable precautions “to avoid or minimize incidental injury to civilians or damage to civilian objects”.<sup>74</sup>

The concept of proportionality was codified in several provisions of Protocol I, particularly in Articles 57<sup>75</sup> and 51.<sup>76</sup> While these articles codified existing customary international law regarding proportionality, they also attempted to shift the responsibility of collateral civilian casualties and property damage to the attacker regardless of the defender’s actions or inactions, representing a departure from customary law.<sup>77</sup> The United States did not ratify Protocol I, even though it regards proportionality as existing customary international law.<sup>78</sup>

The classic example of disproportionate action is the destruction of a village and its population to kill a single enemy sniper.<sup>79</sup> However, “[l]awful combat actions are not subject to some sort of ‘fairness doctrine’, and neither the law of war in general nor the concept of proportionality in particular imposes a legal or moral obligation on a nation to sacrifice manpower, firepower, or technological superiority over an opponent”.<sup>80</sup> What is prohibited by the concept of proportionality is any action that is in effect an intentional attack on the civilian population or civilian objects.<sup>81</sup>

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<sup>73</sup> See *Middle East Watch*, supra note 8, at 41.

<sup>74</sup> AFP 110-31, supra note 2, at 5-10. Note, however, that this provision in AFP 110-31 uses the term ‘feasible’ precautions, thereby imposing a higher standard than mandated by customary law. Customary international law only requires that an attacker (or defender) takes reasonable precautions. See Protocol I, supra note 68, art 57, paragraph 4. The requirement that the parties to a conflict shall distinguish between the civilian population and combatants and between civilian objects and military objectives is found in Article 48 of Protocol I, representing customary international law. See id, art 48, Francoise J. Hampson, Proportionality and Necessity in the Gulf Conflict, Panel Discussion at the American Society of International Law 2 (1 Apr 1992) (on file with the George Washington Journal of International Law and Economics).

<sup>75</sup> Protocol I, supra note 68, art 57.

<sup>76</sup> Id art 51.

<sup>77</sup> See Parks, supra note 17, at 163-65.

<sup>78</sup> See Michael J. Matheson, ‘The United States Position on the Relation of Customary International Law to the 1977 Protocols Additional to the 1949 Geneva Conventions: Speech at the Sixth Annual American Red Cross-Washington College of Law Conference on International Humanitarian Law: A Workshop on Customary International Law and the 1977 Protocols Additional to the 1949 Geneva Conventions’ (22 Jan 1987), in 2 *AM UJ Int’l L and Pol’y* 419, 426 (1987) (stating that ‘[A]ll practicable precautions, taking into account military and humanitarian considerations,[are to] be taken in the conduct of military operations to minimise incidental death, injury, and damage to civilians and civilian objects’.) Id at 426-27; see also AFP 110-31, supra note 2, at 5-9 to 5-10. Adopting almost verbatim language from Article 57 of protocol 1, the US Air Force provides:

Those who plan or decide upon an attack must:

- a. Do everything feasible to verify that the objectives to be attacked are neither civilians nor civilian objects and are not subject to special protection but are military objectives and that it is permissible to attack them;
- b. Take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimising, incidental loss of civilian life, injury to civilians, and damage to civilian objects; and
- c. Refrain from deciding to launch any attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.

Id at 5-9.

<sup>79</sup> See Parks, supra note 17, at 168.

<sup>80</sup> Id, at 169-70.

<sup>81</sup> See W. Hayes Parks, ‘Linebacker and the Law of War’, 34 *Air University. Review* 2, p 14 (1983).

Belligerent acts must be aimed only against military targets. The determination of whether an objective is legitimate or not is predicated upon the relative advantage of attacking the objective.<sup>82</sup> For objects normally devoted to civilian use, such as schools, hospitals, or places of worship, there is a presumption that they are not being used for military purposes and therefore shall not be subject to attack.<sup>83</sup>

In determining whether an action conforms to the concept of proportionality, the military planner must first analyse the “concrete and direct military advantage anticipated”.<sup>84</sup> Attacks that have no direct military advantage are prohibited, even though their indirect purpose may be to terminate the conflict.<sup>85</sup> Moreover, the military planner must calculate the likelihood and scale of civilian losses in deciding whether and how to carry out the mission.<sup>86</sup> The evaluation must be made at the time of the mission and not later with the benefit of hindsight.<sup>87</sup> Where it is established that civilian casualties from an attacker’s mission “were not and could not reasonably be foreseen”, there is no breach of the principle of proportionality.<sup>88</sup> It is also important to note that in the case of an exclusively military environment, such as forces entrenched in the desert and far from civilian populations, the principle of proportionality is not relevant.<sup>89</sup>

Direct attacks against civilian populations of the enemy are prohibited, as is the use of civilians as shields to guarantee immunity for a military object.<sup>90</sup> If civilians are used for such a purpose, injury incurred by the civilian populations as a result of an attack upon a legitimate target would not constitute a violation of the law of war by the attacker as long as the attacker has exercised ordinary care.<sup>91</sup> It is important, therefore, to determine what constitutes a legitimate military target.

### ***Military Necessity***

In order to determine what constitutes a legitimate military target, it is important to understand the concept of military necessity. Military necessity is not defined anywhere in the laws of war, but it is related to the principles of proportionality and discrimination.<sup>92</sup> The most comprehensive discussion of military necessity can be found in manuals of the US Department of Defense and the military services.<sup>93</sup> The US Air Force, for example, defines military necessity as those “measures of regulated force not forbidden by international law which are indispensable for securing the prompt submission of the enemy, with the least possible expenditure of economic and human resources”.<sup>94</sup> This definition suggests a balancing of target selection, means of

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<sup>82</sup> See L.C. Green, *Essays on the Modern Law of War*, p 143 (1985).

<sup>83</sup> See Protocol I, supra note 68, art 52(3).

<sup>84</sup> Hampson, supra note 74, at 3.

<sup>85</sup> See id.

<sup>86</sup> See id.

<sup>87</sup> See id.

<sup>88</sup> Id, at 3-4.

<sup>89</sup> See id, at 6.

<sup>90</sup> See Protocol I, supra note 68, art 51(7).

<sup>91</sup> See id; Parks, supra note 17, at 162.

<sup>92</sup> See Arkin et al, supra note 3, at 115.

<sup>93</sup> See id.

<sup>94</sup> AFP 110-31, supra note 2, at 1-5 to 1-6.

attack, and the probability of success.<sup>95</sup> The Air Force uses a two-pronged test to define legitimate military objectives. The first prong limits military objectives to those objects or targets which by their nature, location, purpose, or use contribute effectively to the enemy's military action.<sup>96</sup> The second prong determines whether the total or partial destruction, neutralisation, or capture of the target offers a definite military advantage under the existing circumstances.<sup>97</sup> Once a target is determined to be legitimate, however, in order to prevent unnecessary suffering, there is not an unlimited license to attack it.<sup>98</sup> Rather, it must then be determined whether the attack is valid according to the concept of proportionality.

Customary practice has been that military equipment such as units and bases, and economic targets such as power sources, industry, transportation, and command and control centers, are always legitimate targets.<sup>99</sup> This includes transportation and communications systems.<sup>100</sup> However, "[t]he inherent nature of an object is not controlling; its value to the enemy or the perceived value of its destruction is the determinant".<sup>101</sup> Even traditional civilian objects, such as private homes, if used for military purposes, may be attacked. The important factor is to determine if the target makes an effective contribution to the enemy's military operations; if it does, it is subject to attack, wherever located, even if within heavily populated areas.<sup>102</sup>

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<sup>95</sup> See Parks, *supra* note 82, at 21. In *re* List and Others (Hostages Trial) (US Military Tribunal at Nuremberg 1948), in 1948 *Ann Dig & Rep Pub Int'l. Cases* 632 (H. Lauterpacht ed, 1953), the US Military tribunal stated that:

[m]ilitary necessity permits a belligerent, subject to the laws of war, to apply any amount and kind of force to compel the complete submission of the enemy with the least possible expenditure of time, life, and money ... . It permits the destruction of life of armed enemies and other persons whose destruction is incidentally unavoidable by the armed conflicts of the war ... . Destruction as an end in itself is a violation of International Law. There must be some reasonable connection between the destruction of property and the overcoming of the enemy force. It is lawful to destroy railways, lines of communication or any property that might be utilised by the enemy. Private homes and churches may even be destroyed if necessary for military operations. It does not admit of wanton devastation of a district or the wilful infliction of suffering upon its inhabitants...

*Id* at 646-47; see *11 Trials of War Criminals Before the Nuremberg Military Tribunals* pp 1253-54 (US Gov't Printing Off, 1950).

The United States Navy Manual defines military necessity as the concept that 'permits a belligerent to apply only that degree and kind of regulated force, not otherwise prohibited by the laws of war, required for the partial or complete submission of the enemy with the least possible expenditure of time, life, and physical resources'. Office of the Chief of Naval Operations, US Dept of the Navy, NWP 10-2, *Law of Naval Warfare* 2-4 (1955).

<sup>96</sup> See AFP 110-31, *supra* note 2, at 5-8 to 5-9. The Air Force uses language almost identical to that in Article 52(2) of Protocol I. See Protocol I, *supra* note 68, art 52(2).

<sup>97</sup> See AFP 110-31, *supra* note 2 at 5-9. Once again the language is adopted from Protocol I. See Protocol I, *supra* note 68, art 52(2).

<sup>98</sup> See Protocol I, *supra* note 68, art 51; AFP 110-31, *supra* note 2, at 5-9 to 5-10.

<sup>99</sup> Parks, *supra* note 17, at 145; see US Dept of the Air Force, AFP 200-17, *An Introduction to Air Force Targeting*, p 9 (1989) [hereinafter AFP 200-17].

<sup>100</sup> See AFP 200-17, *supra* note 100, at 9; Parks, *supra* note 17, at 145.

<sup>101</sup> Parks, *supra* note 82, at 21-23; see also Army Field Manual, *supra* note 32, at 19 (defining military objectives to include, for example, '[f]actories producing munitions and military supplies, military camps, warehouses storing munitions and military supplies, ports and railroads being used for the transportation of military supplies, and other places devoted to the support of military operations or the accommodation of troops'); AFP 200-17, *supra* note at 100, at 37 (discussing military objectives, which may include 'civilian transportation and communication systems, dams, and dykes').

<sup>102</sup> See Parks, *supra* note 82, at 23.

*Why Protocol I was not ratified by the United States*

The greatest concerns regarding Protocol I for the US military revolved around Articles 48 through 55, which contained the provisions most directly relating to combat operations.<sup>103</sup> These provisions tend to shift responsibility for the protection of the civilian population away from the defender - the party who has control over them and who has traditionally borne primary responsibility for their safety - almost exclusively to the attacker.<sup>104</sup> The customary law of war has traditionally placed the responsibility of differentiating between military objectives and civilians and/or civilian objects on all parties: the attacker, the defender, and the civilian population.<sup>105</sup> The attacker has the obligation to use reasonable caution in order to minimize collateral civilian injury and damage in accordance with the mission objectives and without unreasonable risk.<sup>106</sup> The defender has the obligation to ensure reasonable separation between the civilian population and military objectives.<sup>107</sup> Responsibility for death or injury resulting from the illegal action of the defender lies with the defender alone.<sup>108</sup> The civilian population is also obligated to use reasonable precaution to remove themselves from the area of military targets.<sup>109</sup> The primary responsibility for protecting the civilian population, however, lies with the defender and individual civilian; in most wartime situations, the attacker is not aware of the location of the civilian population and is unable to direct civilian movement.<sup>110</sup> If the primary responsibility for protecting civilians was placed on the attacker, the defender could take advantage of this through tactics such as moving aircraft into residential areas.<sup>111</sup>

Although the US military takes the position that an attacker should accept some responsibility to minimize collateral civilian casualties,<sup>112</sup> Protocol I assumes that this is the norm, when in fact it is only the best case scenario.<sup>113</sup> It is important to remember that the “[a]ttack of a military objective, wherever located, is lawful. While the number of civilian casualties that occur are the result of that attack, the attack is not necessarily the cause of those casualties, nor may they necessarily be attributable to the attacker.”<sup>114</sup>

<sup>103</sup> See Parks, *supra* note 17, at 112.

<sup>104</sup> See *id.*

<sup>105</sup> See W. Hays Parks, ‘Rules of Engagement: No More Vietnams’, *117 US Naval Inst Proceedings*, p 27 (1991).

<sup>106</sup> See *id.*; *supra* notes 72-92 and accompanying text.

<sup>107</sup> See Parks, *supra* note 106, at 27; *supra* notes 72-92 and accompanying text.

<sup>108</sup> See W. Hays Parks, ‘Crossing the Line’, *112 US Naval Inst Proceedings* 40, p 47 (1986).

<sup>109</sup> See Parks, *supra* note 106, at 27.

<sup>110</sup> See Parks, *supra* note 17, at 153.

<sup>111</sup> See Philip Shenon, ‘US Battleship Shells Iraqis in Bunkers on Kuwait Coast’, *NY Times*, 5 Feb 1991, at A12 (reporting that the Iraqis had hidden an airplane in a school because they recognised that the Coalition was avoiding civilian targets.)

<sup>112</sup> See Parks, *supra* note 17, at 156. For example, in 1972 during the Vietnam War, Linebacker II B-52 air strikes against targets in the Hanoi and Haiphong areas, certain precautions were taken by air crews to reduce civilian casualties and damage. B-52 radar navigators, for instance, were ordered to return from their missions without dropping their bombs unless 100% certain that the bombs were on target. In addition, all B-52 target maps included the location of schools, hospitals and POW camps.

See *id.*, at 154.

<sup>113</sup> See *id.*, at 156.

<sup>114</sup> *Id.*, at 177.

Customary law permits the attack of a military target even when the defender uses civilians to “immunize” the target in violation of the customary laws of warfare and the 1907 Hague rules.<sup>115</sup> This makes more sense when considering the civilian’s best interests. If customary law were otherwise, it would encourage defenders to leave the civilian population in place rather than evacuate them from the vicinity of the military objective, or use the civilian population as a shield from attack in violation of Article 51(7) of Protocol I. It would also permit defenders to “cost-out” a high value target by surrounding a target with so many civilians that the effects of the attack would be disproportionate to the perceived value of the attack.<sup>116</sup>

### **United Nations Resolution 2444**

The 1968 United Nations General Assembly Resolution 2444, entitled Respect for Human Rights in Armed Conflicts,<sup>117</sup> was also applicable to the Persian Gulf War. The resolution affirmed three general principles of the law of war:

- a. That the right of the parties to a conflict to adopt means of injuring the enemy is not unlimited;
- b. That it is prohibited to launch attacks against the civilian populations as such; [and]
- c. That distinction must be made at all times between persons taking part in the hostilities and members of the civilian population to the effect that the latter be spared as much as possible.<sup>118</sup>

The US Government has expressly recognized this resolution as a declaration of existing customary international law.<sup>119</sup> The United States, however, has also made clear that although the civilian population may not be the object of attack, incidental civilian injury or damage to civilian objects is an unavoidable risk when attacking legitimate military targets.<sup>120</sup> An official for the US Government has stated:

[The] principle [of military necessity] recognizes the interdependence of the civilian community with the overall war effort of a modern society. But its application enjoins the party controlling the population to use its best efforts to distinguish or separate its military forces and war making activities from members of the civilian population to the maximum extent feasible so that civilian casualties and damage to civilian objects incidental to attacks on military objectives, will be minimized as much as possible.<sup>121</sup>

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<sup>115</sup> See *id.*

<sup>116</sup> See *id.*

<sup>117</sup> Resolution 2444, *supra* note 22.

<sup>118</sup> *Id.*

<sup>119</sup> See Excerpts from Letter from J. Fred Buzhardt, General Counsel, US Department of Defense, to Senator Edward M. Kennedy, Chairman of the Subcommittee on Refugees of the Senate Committee on the Judiciary (22 Sept 1972), in Arthur W. Rovine, ‘Contemporary Practice of the United States Relating to International Law’, *67 Am J Int’l*, 118, 122 (1973).

<sup>120</sup> See *id.*, at 122-23.

<sup>121</sup> *Id.*, at 123.

## 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict

In addition to protection of the civilian population and objects provided by the law of war, certain religious, cultural, and charitable objects have been given special protection. These protections can be found in Articles 27 and 56 of the 1907 Hague Convention IV<sup>122</sup> and in Article 5 of the 1907 Hague Convention IX.<sup>123</sup> World War II, however, once again demonstrated the inadequacy of the law at the time, and in 1954 the General Conference of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) assembled a committee of government experts for a conference at the Hague.<sup>124</sup> This conference resulted in the Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict (1954 Hague Convention).<sup>125</sup> While the United States is not a party to the 1954 Hague Convention, the US Army, which would have primary responsibility for executing the Convention provisions among the military services, integrated the treaty into its doctrine as early as 1955.<sup>126</sup>

The requirement that protection of cultural property is dependent on it not being used for military purposes continued through the 1954 Hague Convention, and is still applicable today.<sup>127</sup> Article 4 of the 1954 Hague Convention provides that the parties agree not to use cultural property for military purposes and to refrain from any hostile acts towards cultural property.<sup>128</sup> In cases of military necessity, however, the obligations may be waived.<sup>129</sup>

In order to receive special protection, cultural property must be “situated at an adequate distance from any large industrial centre or from any important military objective constituting a vulnerable point ... [and cannot be] used for military purposes”.<sup>130</sup> These provisions are important in that they recognize the value of religious and cultural objects to society, but, at the same time, acknowledge that the circumstances of war cannot guarantee immunity for such objects particularly when they are in, around, or obstructing in any way a legitimate military target. If a religious, cultural, or charitable object not meeting the provisions laid out in the 1954 Hague Convention is destroyed, other laws of war, such as military necessity and proportionality, become applicable.

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<sup>122</sup> 1907 Hague Convention IV, supra note 19, arts 27, 56.

<sup>123</sup> 1907 Hague Convention IX, supra note 20, art 5.

<sup>124</sup> See *Documents on the Laws of War*, supra note 19, at 339.

<sup>125</sup> 1954 Hague Convention, supra note 23; see *Documents on the Laws of War*, supra note 19, at 339.

<sup>126</sup> See Parks, supra note 17, at 59-60. The United States declined to sign the 1954 Hague Convention because of military objections. See *id.*

<sup>127</sup> See 1954 Hague Convention, supra note 23, art 9.

<sup>128</sup> *Id.*, art 4.

<sup>129</sup> *Id.*, art 4(2).

<sup>130</sup> *Id.*, arts 8(1)(a)-(b). More specifically, cultural property may not be used for purposes likely to expose it to destruction in armed conflict. See McCoubrey, supra note 18, at 120.

## PRECISION-GUIDED MUNITIONS IN OPERATION DESERT STORM

### Precision-Guided Missiles

In Operation Desert Storm, the Coalition used both precision-guided munitions (PGMs) guided by infrared, electro-optics, or laser systems, otherwise known as “smart” bombs, as well as conventional, high-explosive bombs known as “dumb” bombs, to attack targets in Iraq and Kuwait.<sup>131</sup> PGMs are variants of the first prototype munitions used in the Vietnam War.<sup>132</sup> The same basic guidance technology used in Vietnam is still used in modern PGMs,<sup>133</sup> and this highly accurate form of warfare most likely still carries with it many of the same problems that arose when it was first used in the Vietnam conflict.<sup>134</sup>

A precision-guided munition uses a guidance system that directs it to its target. Some PGMs use a rocket motor system, while others simply glide towards their target.<sup>135</sup> A variant of the PGM, the laser-guided bomb (LGB) locks on to an area of light created by a laser.<sup>136</sup> An electro-optically guided bomb (EOGB) uses a video camera, or an infrared sensor for night attacks, and a transmitter.<sup>137</sup> After bomb release, the weapon systems operator steers the bomb to its target and, once close, “locks the weapon’s video sensor on to the target and the missile will complete the attack”.<sup>138</sup> Although PGMs are very expensive, they are extremely accurate and can destroy a target with only one weapon if the targeting information is accurate, has been correctly programmed into the weapon, and all systems are properly functioning.<sup>139</sup>

During the Desert Storm air campaign, the United States flew more than 112,000 individual sorties,<sup>140</sup> in which, it has been estimated, 250,000 individual bombs and missiles were delivered from the air.<sup>141</sup> Estimates indicate that about 22,000, or 8.8% of the bombs or missiles dropped were precision-guided munitions.<sup>142</sup> Approximately 9,000 to 10,000 of these were laser-guided bombs, about 2,000 were anti-radiation missiles fired at radar installations, and about 10,000 were guided anti-tank

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<sup>131</sup> See Mark Hewish et al, ‘Precision-Guided Munitions Come of Age’, *24 Int’l Def Rev*, pp 459, 460 (1991).

<sup>132</sup> See *id.*

<sup>133</sup> See *id.* The development of precision-guided missiles began in World War II with the German Fritz-X, ‘a gliding bomb directed to its target by radio signals from a bomber flying overhead. But such early efforts had little practical effect on warfare’. Malcolm W. Browne, ‘Invention that Shaped the Gulf War: The Laser Guided Bomb’, *NY Times*, 26 Feb 1991, at C1. When the first precision-guided bombs were used in Vietnam, they often missed even the stationary targets at which they were aimed. See *id.* For an in-depth discussion on PGM technology in its original forms, see Gary S. Ziegler, ‘Weather Problems Affecting Use of Precision Guided Munitions’, *32 Naval War College Rev*, p 95 (1979).

<sup>134</sup> See generally Parks, *supra* note 17, at 185-94 (discussing problems using PGMs encountered during the Vietnam War).

<sup>135</sup> See Bill Sweetman, ‘Modern Bombs in the Gulf’, *Jane’s Defence Weekly*, 9 Feb 1991, at 178.

<sup>136</sup> See *id.*

<sup>137</sup> See *id.*

<sup>138</sup> *Id.*

<sup>139</sup> See Allen A. Cocks, ‘Smart Weapons - On Target (So Far)’, *Marine Corps Gazette*, Apr 1991, at 58.

<sup>140</sup> *Pentagon Final Report*, *supra* note 9, at 221.

<sup>141</sup> See Arkin et al, *supra* note 3, at 78.

<sup>142</sup> See *id.*



weapons.<sup>143</sup> The PGMs had an accuracy rate of 90%, while the conventional “dumb” bomb accuracy was 25%.<sup>144</sup> PGMs effectively demolished command and control bunkers and hardened aircraft shelters.<sup>145</sup> They successfully destroyed forty of fifty-four targeted bridges between Baghdad and Basra.<sup>146</sup> PGMs also made attacks possible on targets in heavily populated civilian areas.<sup>147</sup> Their use in areas such as Baghdad was instrumental in minimizing collateral civilian casualties and damage.<sup>148</sup>

The aircraft used by the coalition forces during the Persian Gulf War ranged from older aircraft, such as the B-52G Stratofortress, A-7 Corsairs, A-6 Intruders, A-4 Skyhawks, Jaguars, and F-4 Phantoms, to the modern generation of F-117A Stealth fighters, F-14 Tomcats, F-15E Eagles, F-111 Aardvarks, F-16 Fighting Falcons, F/A-18 Hornets and British Tornados.<sup>149</sup>

The F-117A Stealth was the only aircraft used to attack targets in downtown Baghdad.<sup>150</sup> It is equipped with PGM capability, and its stealth qualities enable it to penetrate through heavy air defenses without detection.<sup>151</sup> The F-117A is able to attack targets from higher altitudes than conventional aircraft, allowing more time for the pilot to identify the target and aim weapons.<sup>152</sup>

The F-15E Eagle utilized the Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) system to locate and destroy Iraqi missiles and launchers.<sup>153</sup> LANTIRN uses a radar system that is “terrain-following”.<sup>154</sup> At low altitudes (100 to 200 feet), the terrain-following radar can act as an autopilot, and the weapon is automatically released and guided to the target.<sup>155</sup>

The F-111 Aardvark has infrared capabilities as well.<sup>156</sup> The F-111 attacked command and control facilities, chemical, biological, and nuclear sites; airfields; bunkers; and air defense assets.<sup>157</sup> The A-6 Intruder, the F-16 Fighting Falcon, and the F/A-18 Hornet also dropped PGMs.<sup>158</sup> Conventional bombs were mainly dropped by the

<sup>143</sup> See *id.*

<sup>144</sup> See Barton Gellman, ‘US Bombs Missed 70% of Time’, *Wash Post*, 16 Mar 1991, at A1.

<sup>145</sup> *Pentagon Final Report*, supra note 9, at 222; see Hewish et al, supra note 132, at 460.

<sup>146</sup> Hewish et al, supra note 132, at 460.

<sup>147</sup> See *id.*

<sup>148</sup> See *id.*

<sup>149</sup> See Capps, supra note 7, at 26. For a detailed discussion of the aircraft used during the war and their capabilities, see *Pentagon Final Report*, supra note 9, app T.

<sup>150</sup> *Pentagon Final Report*, supra note 9, app T at T-74.

<sup>151</sup> *Id.* app T, at T-73 to T-74; see Bill Sweetman, F-117A Excels in ‘Desert Storm’, *Jane’s Defence Weekly*, 26 Jan 1991, at 104.

<sup>152</sup> See Sweetman, supra note 152, at 104.

<sup>153</sup> See *Pentagon Final Report*, supra note 9, app T, at T-60; Eric Beaudan, ‘Flash Gordon, Here We Come’, *Def & Dipl*, May/June 1991, at 29.

<sup>154</sup> Beaudan, supra note 154, at 29.

<sup>155</sup> See *id.*

<sup>156</sup> See *Pentagon Final Report*, supra note 9, app T, at T-68.

<sup>157</sup> *Id.* app T, at T-69. The F-111 utilised forward-looking, infrared radar (FLIR) - a specialised camera whose sensor is calibrated at minus 320 degrees Fahrenheit. This low temperature allows the camera to detect infrared radiation given off by warmer objects. The FLIR changes the signal into a visible image displayed on the pilot’s computer monitor. See Browne, supra note 134, at C8.

<sup>158</sup> See Otto Friedrich (ed), *Desert Storm: The War in the Persian Gulf*, p 39 (1991) [hereinafter *Desert Storm*].

B-52G Stratofortress.<sup>159</sup> The use of conventional bombs occurred primarily in the barren desert where a portion of the elite Iraqi Republican Guard was located.<sup>160</sup> The B-52s were able to drop a large number of bombs onto the battlefield - an area in which no protected objects existed and where Iraqi troops were entrenched in the desert and difficult to attack.<sup>161</sup> The Coalition forces were successful in breaking Iraqi morale with the saturation bombing of the B-52s.<sup>162</sup> PGMs would have been largely ineffective in comparison to conventional bombing, because high level saturation bombing is more effectively conducted by conventional bombs due to their low cost.<sup>163</sup> Moreover, because of the high sensitivity of PGMs to adverse weather, the B-52 equipped with conventional bombs was the better strategic choice.<sup>164</sup>

The Coalition carefully selected the available aircraft and weapons to minimize civilian injuries and damage. At a briefing on 27 January 1991, General H. Schwarzkopf stated:

I think we've stated all along that we're being absolutely as careful as we can not only in the way we are going about executing our air campaign, but in the type of armament we're using. We're using the appropriate weapon against the appropriate targets. We're being very, very careful in our direction of attacks to avoid damage of any kind to civilian installations.<sup>165</sup>

### **Tomahawk Cruise Missiles**

In addition to precision-guided missiles dropped from the air, Tomahawk cruise missiles fired from the Navy ships and submarines in the Persian Gulf and Red Sea had a 98% launch success rate.<sup>166</sup> Of the 288 fired, 282 successfully achieved cruise flight.<sup>167</sup> This was the first time that the Tomahawk cruise missile was used in a conflict.<sup>168</sup>

Tomahawks are “[p]acked with advanced electronics and several different guidance systems, [and] they are essentially flying computers capable of sailing through the goalposts on a football field from a range of several hundred miles”.<sup>169</sup> The Tomahawk uses a two-step guidance system to successfully reach its target.<sup>170</sup> First, the missile compares the topography of key landmarks along its flight path with detailed contour maps stored in its computer memory.<sup>171</sup> As the Tomahawk

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<sup>159</sup> See *id.* at 44; J. Michael Kennedy & John M. Broder, ‘Allies Drive Iraqis from Saudi Town and Take 167 Prisoners’, *L.A. Times*, 1 Feb 1991, at A1.

<sup>160</sup> See *Desert Storm*, *supra* note 159 at 44.

<sup>161</sup> Interview with W. Hays Parks, Chief of International Law, US Army, in Arlington, VA (11 Mar 1992) [hereinafter Interview with Hays Park].

<sup>162</sup> See John M. Broder, ‘Schwarzkopf’s War Plan Based on Deception’, *L.A. Times*, 11 Feb 1991, at 24.

<sup>163</sup> See Michael Dugan, ‘The Gulf War: The Air War’, *US News and World Rep.*, 11 Feb 1991, at 24.

<sup>164</sup> Interview with Hays Parks, *supra* note 162; see also Zeigler, *supra* note 134, at 95-96 (discussing the sensitivity of PGMs to adverse weather).

<sup>165</sup> Excerpts from remarks by General Schwarzkopf in Riyadh, *NY Times*, 28 Jan 1991, at A9.

<sup>166</sup> *Pentagon Final Report*, *supra* note 9, app T, at T-201.

<sup>167</sup> See *id.*

<sup>168</sup> See Mark Hewish, ‘Tomahawk Enhances Navy Role in Land Warfare’, *24 Int’l Def Rev.*, pp 458, 458 (1991).

<sup>169</sup> Philip Elmer-DeWitt, ‘Inside the High-Tech Arsenal’, *Time*, 4 Feb 1991, at 46.

<sup>170</sup> See *id.*

<sup>171</sup> See *id.*

approaches its target, a small digital camera then compares the view from its nose cone with a catalogue of images prepared from satellite photos.<sup>172</sup> If the missile is even slightly off course, it will make adjustments.<sup>173</sup> Although Tomahawks proved their accuracy in Desert Storm, they are extremely expensive at \$1.35 million each,<sup>174</sup> and their high cost make their widespread use in warfare inefficient.

Not only would exclusive Tomahawk usage be inefficient, but so too would exclusive PGM use for any nation engaged in battle. PGMs are suited for use in clear weather for targets in heavily populated areas.<sup>175</sup> The Coalition used PGMs to accurately hit their targets in populated areas while minimizing human loss.<sup>176</sup> Conventional bombing, on the other hand, was effectively used in the desert, as it is cheaper and its delivery systems allow for saturation bombing of large military concentrations.<sup>177</sup>

### **Factors Other Than Collateral Damage Taken Into Account in Determining What Type of Weapon to Use**

While the use of PGMs effectively reduces collateral damage and injury, other factors must also be considered by a military commander when determining what weapon to use on a specific target.<sup>178</sup> Cost is an important factor. Precision munitions come with a high price tag, ranging from \$50,000 to \$100,000 each.<sup>179</sup> While each Tomahawk cruise missile costs \$1.35 million,<sup>180</sup> conventional high-explosive bombs are much less expensive and are widely available.<sup>181</sup>

Another important consideration is that PGMs, never widely utilized in combat, have significant drawbacks. They create a high workload for the crew, shorten the desirable stand-off range, and restrict the pilot's freedom of action after weapon release.<sup>182</sup> Even when PGMs are used against a military target, they may miss the target because of weather obstructing the pilot's view,<sup>183</sup> technological malfunction,<sup>184</sup> or because the aircraft is dodging anti-air defenses.<sup>185</sup> Any one of these factors could cause a

<sup>172</sup> See *id.*

<sup>173</sup> See *id.*

<sup>174</sup> See Browne, *supra* note 134, at C8.

<sup>175</sup> See Hewish et al, *supra* note 132, at 460; Zeigler, *supra* note 134.

<sup>176</sup> See US Dept of the Air Force, *White Paper: Air Force Performance in Desert Storm*, p 7 (1991).

<sup>177</sup> See Eric Micheletti, *Air War Over the Gulf* p 15 (1991).

<sup>178</sup> If that were the case, less collateral damage would have occurred in Tripoli had special forces entered in on foot. Tactical air, however, 'offered the ability to place the greatest weight of ordnance on the targets in the least amount of time while minimising collateral damage and providing the greatest opportunity for survival of the entire force'. Parks, *supra* note 109, at 48.

<sup>179</sup> See R. Jeffrey Smith and Evelyn Richards, 'Numerous US Bombs Probably Missed Targets: Not All Munitions Used in Gulf Are Smart', *Wash Post*, 22 Feb 1991, at A25.

<sup>180</sup> See Browne, *supra* note 134, at C8.

<sup>181</sup> See Benjamin Weiser, 'No Shortage of Bombs, Missiles Foreseen for US', *Wash Post*, 25 Jan 1991, at A28. One Pentagon official emphasised that one dumb bomb '[c]osts less than \$1 a pound - it's cheaper than hamburger'. *Id.*

<sup>182</sup> See Hewish et al, *supra* note 132, at 460.

<sup>183</sup> '[W]hat the TV audiences did not see were the times when the weather was so poor that the target could not be seen from the air.' George Baber et al, 'Grandma's War', 1991 *RAF YB Special*, p 20.

<sup>184</sup> See Smith & Richards, *supra* note 180, at A31.

<sup>185</sup> See Parks, *supra* note 17, at 191. To avoid enemy fire pilots often 'jink and dive' - zig-zag - which decreases the accuracy of an attack. See Jeffrey M. Lenorovitz, 'Air Crew Training, Avionics Credited for F-15E's High Target Hit Rates', *Aviation Week & Space Tech*, 22 Apr 1991, at 54.

PGM to miss its target, thereby resulting in collateral civilian injury and damage to civilian objects.

### *Anti-Air Defenses*

In attempting to avoid anti-air fire, aircraft must fly at higher altitudes, which decreases bombing accuracy and breaks air-crew concentration on striking the target.<sup>186</sup> Anti-air defenses can also cause the jettisoning of bombs early.<sup>187</sup> When this occurs, the civilian population and civilian objects can suffer extreme injury. Moreover, anti-air fire can force pilots to swerve, and as a result bombs may slip from the guidance of the radar beam, causing them to land on non-military targets.<sup>188</sup>

Obscurants, such as smoke pots,<sup>189</sup> misguide the munitions being used. Obscurants have only one purpose: to decrease the accuracy of the PGM by blinding its seeker head, resulting in the missile missing its target.<sup>190</sup> If the obscurant is successful and the target is in or around a populated area, civilian casualties are likely. Because the defender causes the missile to miss its legitimate target, however, the attacker is not responsible for any collateral damage.<sup>191</sup>

### *Weather*

Precision-guided munitions are extremely sensitive to the weather and the environment.<sup>192</sup> PGMs consist of two components: the sensor and the tracker,<sup>193</sup> the sensor being the most sensitive to the environment.<sup>194</sup>

PGM sensors can be compared to the human eye or a video camera,<sup>195</sup> making it easier to recognize why PGMs are so sensitive to the environment. Their accuracy may be affected by icing, turbulence, lightning, erosion, and electrical charge buildup.<sup>196</sup> "Icing can disturb aerodynamic flight, but it can also coat the sensor cover to such an extent that the sensor is no longer useful. ...[Erosion] describes the

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<sup>186</sup> See Parks, *supra* note 17, at 191.

Precision-guided bombs and missiles are not infallible. They can be thrown off course by pilot error and by clouds that obscure their vision devices. In addition, the bombs may slip out of the 'basket' of the radar beam reflected from the target if the pilot serves too sharply to avoid ground fire and missiles.

Browne, *supra* note 134, at C8.

<sup>187</sup> See Parks, *supra* note 17, at 191.

<sup>188</sup> See Browne, *supra* note 134, at C8.

<sup>189</sup> A smoke pot produces a smoke or smoke-like screen which effectively obscures visual and infrared light. See Parks, *supra* note 17, at 194.

<sup>190</sup> See *id.* For example, in the Linebacker II missions in Vietnam, '[k]ey targets were painted to blend with local features to prevent the contrast required for [electro-optical guided bombs], while smoke pots were placed around other targets to defend them against [laser-guided bombs]'. *Id.*

<sup>191</sup> See *id.* at 196; see also *id.* at 194-97 (illustrating the difficulties in attributing responsibility for civilian casualties).

<sup>192</sup> See Zeigler, *supra* note 134.

<sup>193</sup> See *id.*, at 96.

<sup>194</sup> See *id.*

<sup>195</sup> See *id.*

<sup>196</sup> See *id.*, at 99.

deterioration, through pitting of the sensor cover by passage through large aerosols, hail and the like.”<sup>197</sup>

Clouds and fog also deteriorate the PGM’s accuracy. Like the human eye, the sensor of the missile cannot see clearly through cloud or fog.<sup>198</sup> In addition, “[r]educed visibility because of scattering and absorption by haze, fog and precipitation further limit [sic] the capabilities of visible systems”.<sup>199</sup> Moreover, the PGM’s sensor system requires a minimum level of illumination on the target.<sup>200</sup> Heavy cloudiness and precipitation can decrease the necessary amount of sunlight reflection onto the target which properly illuminates it for the seeker head.<sup>201</sup>

When so many environmental factors can readily cause a PGM to miss its target, it is easy to comprehend why they cannot be used in every military strike. The reason for using a smart bomb would be completely undermined if the natural environment at the time of the attack would raise doubts as to the missile’s accuracy. In these circumstances, a precision-guided missile could cause even more collateral civilian injury and damage than a conventional bomb.

## **AN ANALYSIS OF PRECISION-GUIDED MUNITIONS AND OPERATION DESERT STORM**

The Desert Storm campaign was not the first time PGMs were used, nor was it the first time that their success had prompted debate over whether a military power with a smart bomb capability is obligated to use such technology over more conventional methods of warfare.<sup>202</sup>

The key goals of Operation Desert storm were to (1) “[i]solate and incapacitate the Iraqi regime” by targeting leadership command facilities, electricity production facilities powering military systems, and telecommunications systems; (2) “[g]ain and maintain air supremacy to permit unhindered air operations”; (3) “[d]estroy [nuclear, biological, and chemical] warfare capability”; (4) “[e]liminate Iraq’s offensive military capability by destroying major parts of key military production, infrastructure, and power projection capabilities”; and (5) “[r]ender the Iraqi army and its mechanized equipment in Kuwait ineffective”.<sup>203</sup> Although PGM capability was available, its use was not mandated by the law of war. As discussed previously, the law of war applicable to the Persian Gulf War was customary international law, the Hague Convention Regulations of 1907, the 1949 Geneva Conventions, the 1954 UNESCO agreement (by way of US military doctrine), and the UN Resolution 2444. None of these agreements or regulations requires an aggressor nation to use its most discriminating weaponry, and none suggests that incidental civilian injury and collateral damage to civilian and cultural objects are violations of the law they espouse.

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<sup>197</sup> Id.

<sup>198</sup> See id.

<sup>199</sup> Id.

<sup>200</sup> See id.

<sup>201</sup> See id, at 100.

<sup>202</sup> See Parks, *supra* note 17 at 169, p 193-97.

<sup>203</sup> *Pentagon Final Report*, *supra* note 9, at 125-26.

The United States acted within the obligations of the law of war when bombing Iraqi troops. Even when attacking legitimate military targets in populated areas, the use of precision munitions was not obligatory and mandated by the current law of war.

### **Attack of Legitimate Targets by the Coalition**

Twelve “target sets” were identified for attack by Coalition forces: leadership command facilities; electrical production facilities powering military systems; command, control and communication nodes; strategic and tactical integrated air defense systems; air forces and air fields; known nuclear, chemical, and biological weapons research and production facilities; Scud missile production and storage facilities; naval forces and port facilities; oil refining and distribution facilities; railroads and bridges connecting Iraqi military forces with logistical support centers; Iraqi military units including Republican Guard Forces in the Kuwait theatre of operations; and military storage sites.<sup>204</sup>

All of these targets were legitimate and susceptible to any method of attack allowed by the applicable law of war. Each of these targets contributed to Iraqi military action, and their destruction created a military advantage for the Coalition. Under customary practice and law of war principles, such targets were properly subject to attack.<sup>205</sup>

While the law of war defines legitimate targets, nothing in the law of war regulates the type of weapon that must be used when specifically attacking particular targets; there is no law of war concept requiring that the most discriminatory means be used. The applicable law only mandates a balancing of military necessity and unnecessary suffering so that the concept of proportionality is followed. The rule becomes one of reasonable precaution.<sup>206</sup> Any incidental civilian casualties, though unfortunate, are not violations of the law of war unless the civilian population has been attacked directly.<sup>207</sup> Customary laws of war and treaties have always been recognized that attacking an enemy is not a “suicide pact” and many factors must be considered in determining which weapons to use.<sup>208</sup> Among these considerations are the concepts of

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<sup>204</sup> See *id.*, at 126-30.

<sup>205</sup> See *supra* notes 45-49, 93-103 and accompanying text.

<sup>206</sup> See Protocol I, *supra* note 68, art 57, para 4, *Pentagon Final Report*, *supra* note 9, app O, at O-13.

<sup>207</sup> See Parks, *supra* note 17, at 4. The best known example is the civilian casualties that occurred at the Al-Firdus Bunker, also called the Al-'Amariyah Bunker. Originally an air raid shelter, Al-Firdus had been converted into a military command and control bunker. In contrast to standard air raid shelters - with easily accessible entrances and exits - Al-Firdus Bunker had barbed wire around it, secured entrances, and was camouflaged. Coalition commanders were unaware that civilians were there the night of the attack, but even had they known, the attack would have been lawful as it was a legitimate military target. *Pentagon Final Report*, *supra* note 9, at 189, app O, at O-14.

<sup>208</sup> See Parks, *supra* note 17, at 54.

Were that the case, [Royal Air Force] RAF Bomber Command (for Example) would have been obliged to fly precision-bombing missions exclusively once it demonstrated its capability to do so with the 1943 dam raids by No 617 Squadron, or a nation would be required to sacrifice commando units rather than employ bomber aircraft in attack of military objectives where there is a risk of collateral civilian casualties. No such obligation exists in the law of war.

*Id.* (footnote omitted)

In the US air raid on Tripoli in 1986, for example, President Ronald Reagan and his military advisers could have chosen to send in Green Berets on foot, which would have minimised the possibility of any civilian casualties, but elected instead to conduct the strike by air to minimise the risk to the US servicemen undertaking the mission. Interview with Hays Parks, *supra* note 162.

military necessity, unnecessary suffering, proportionality, cost, weather, manpower, and anti-aircraft defense systems.

### **Proportionality**

Perhaps the most important law of war concept in relation to the use of PGMs is that of proportionality. When the Coalition attacked military targets located in populated areas of Iraq such as Baghdad, the applicable law of war dictated only that the attack be proportional to the military advantage gained, that the weapon used fit into the requirements of military necessity, and that the civilian population not be directly attacked.

In this regard, the US military did more than the law of war required. In fact, US pilots were placed in more danger than necessary so as to minimize collateral civilian injury and damage to civilian objects.<sup>209</sup> In heavily populated areas, the norm was to use precision-guided missiles for attacking legitimate military targets.<sup>210</sup>

“To the degree possible and consistent with risk to aircraft and aircrews, aircraft and munitions were carefully selected so that attacks on targets within populated areas [would be achieved with] the greatest degree of accuracy and the least risk to civilian objects and the civilian population.”<sup>211</sup> Additionally, support aircraft accompanied attacking aircraft so that aircrew distraction would be at a minimum, permitting them to concentrate on their assigned missions.<sup>212</sup> Moreover, air crews attacking targets located in populated areas were directed not to deliver a weapon if they lacked positive identification of their target or if they “were not confident the weapon would guide properly (because of clouds for example)”.<sup>213</sup>

As previously stated, the concept of proportionality prohibits military attacks in which collateral civilian casualties and damage outweigh the possible military advantage.<sup>214</sup> Proportionality acknowledges the inevitability of collateral civilian casualties and collateral damage to civilian objects, particularly where the defender does not adequately separate military targets from the civilian population.<sup>215</sup>

Iraq used its populated areas and areas adjacent to protected objects, such as mosques, medical facilities, and historical and cultural sites, to store military assets, such as personnel, weapons, and equipment, in an effort to obtain the traditional protection afforded these areas.<sup>216</sup> Because the presence of civilians or protected cultural objects will not render a target immune from attack, however, an attacker is only obligated to respect the concept of proportionality. The defending party must exercise reasonable precautions to separate the civilian population and civilian objects from military targets.<sup>217</sup>

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<sup>209</sup> See Richard Pyle, *Schwarzkopf: The Man, The Mission, The Triumph*, p 203, (1991).

<sup>210</sup> See *Pentagon Final Report*, supra note 9, at 240.

<sup>211</sup> *Id.*, app O, at O-10.

<sup>212</sup> *Id.*

<sup>213</sup> *Id.*

<sup>214</sup> See supra notes 72-92 and accompanying text.

<sup>215</sup> *Pentagon Final Report*, supra note 9, at 12-3.

<sup>216</sup> *Id.* app O, at O-12.

Iraq purposefully located legitimate military targets near its civilian population, civilian objects, and cultural property.<sup>218</sup> For example, two fighter aircraft were positioned next to the ancient temple of Ur.<sup>219</sup> The law of war would have allowed an attack on the two fighters, but the commander-in-chief elected not to in order to save the temple out of respect for the protection of cultural property and because the positioning of the aircraft next to the temple had taken the aircraft out of action as no runway or servicing equipment was nearby.<sup>220</sup> Balanced against the potential damage to the temple, these factors favored saving the temple.<sup>221</sup>

Although PGMs have proven to be successful in minimizing civilian losses and damage to civilian objects, the concept of proportionality does not demand their use. Another view of proportionality is as a balance between military necessity and unnecessary suffering, remembering that the presence of civilians in and around a legitimate military target does not detract from its military nature. Thus, any unlawful method of warfare may be used against a target whose destruction has some tactical advantage to the attacker.<sup>222</sup> A precision “smart” bomb, though more accurate than a conventional “dumb” bomb, may not always be the best weapon to use. The use of a conventional bomb in the same situation would violate neither the concept of military necessity nor unnecessary suffering. The use of a precision bomb would not change that analysis so long as the target’s destruction provides the attacker with a military advantage and the PGM is not an “excessive” use of force.

### **Iraqi Obligations Under the Law of War and Failure to Successfully Fulfill Them**

The actions of Iraq during Desert Storm were a leading cause of the collateral civilian casualties and damage to civilian objects. The government of Iraq was required under the applicable law of war to protect its civilian population by initiating evacuation procedures, providing adequate air shelter, and by not placing legitimate military targets in or around heavily populated areas.<sup>223</sup> Unfortunately, Iraq did not live up to its own obligations under the applicable law of war. The Iraqi Government chose not to invoke evacuation procedures for its civilian populations when it was well aware of the threat of attack by Coalition forces once the 15 January 1991 deadline passed.<sup>224</sup> It provided shelters for less than one percent of its population, and it purposely used the civilian population of Iraq and Kuwait to shield legitimate military targets.<sup>225</sup>

The applicable law of war treaties, namely the four Geneva Conventions and the 1907 Hague Conventions along with customary international law, place primary responsibility for the protection of the civilian population and civilian objects on the defender and not the attacker.<sup>226</sup> Iraq, therefore, had the responsibility of removing its

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<sup>217</sup> See Geneva Convention IV, supra note 21, art 28, 1907 Hague Convention IV, supra note 19, art 27; Resolution 2444, supra note 22.

<sup>218</sup> See *Pentagon Final Report*, supra note 9, app O, at O-14.

<sup>219</sup> See *id.*

<sup>220</sup> See *id.*

<sup>221</sup> See *id.*

<sup>222</sup> See supra notes 93-96 and accompanying text.

<sup>223</sup> See *Pentagon Final Report*, supra note 9, app O, at O-13.

<sup>224</sup> *Id.* app O, at O-13 to O-14.

<sup>225</sup> *Id.*



civilian population from areas where legitimate military targets were located instead of using them as human shields. Article 19 of the 1949 Geneva Convention I,<sup>227</sup> Articles 18 and 28 of the 1949 Geneva Convention IV,<sup>228</sup> Article 4(1) of the 1954 Hague Convention,<sup>229</sup> and certain principles of customary law codified in Protocol I<sup>230</sup> prohibit this activity by a party to a conflict. Additionally, the responsibility of minimizing collateral damage and injury is shared by the attacker, defender and civilian.<sup>231</sup> If an attacker targets a legitimate military object, the presence of civilians in and around that object does not make it immune from attack, and any collateral injury or damage due to anti-air defenses becomes the responsibility of the defender, not the attacker.<sup>232</sup>

Iraq was obligated not to place military targets in or around traditionally protected areas, such as schools, hospitals, air raid shelters, or places of worship.<sup>233</sup> When it did so, protection for these areas diminished, as a legitimate target may be attacked at any time, wherever it is located.<sup>234</sup> Military supplies were stored in mosques, schools, and hospitals in Iraq and Kuwait. For example, a cache of silkworm surface-to-surface missiles was found inside a school in Kuwait.<sup>235</sup> In addition, chemical bomb production equipment was discovered in a sugar factory.<sup>236</sup>

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<sup>226</sup> In the air strikes on Libya in 1986, the '[u]ltimate selection of two terrorist related targets in populated areas correctly recognised that the law of war obligation to minimise collateral civilian casualties is mutual, and that a nation uses its own population to shield legitimated targets from attack does so at its own peril, and with full responsibility for its illegal actions'. Parks, *supra* note 109, at 47.

<sup>227</sup> Geneva Convention I, *supra* note 21, art 19.

<sup>228</sup> Geneva Convention IV, *supra* note 23, arts 18.

<sup>229</sup> 1954 Hague Convention, *supra* note 23, art 4(1).

<sup>230</sup> See Protocol I, *supra* note 68, arts 48, 51(7), 53.

<sup>231</sup> See Parks, *supra* note 106, at 27.

<sup>232</sup> See *id.* Iraq could have taken advantage of provisions in the applicable law of war to set up neutral or demilitarised zones. Article 14 of Geneva Convention IV states that:

after the outbreak of hostilities, the Parties thereto, may establish in their own territory and, if the need arises, in occupied areas, hospital and safety zones and localities so organised as to protect from the effects of war, wounded, sick and aged persons, children under fifteen, expectant mothers and mothers of children under seven.

Geneva Convention IV, *supra* note 21, art 14.

Article 15 of Geneva Convention IV states that neutralised zones may be established 'in the regions where fighting is taking place'. *Id.* art 15.

<sup>233</sup> *Pentagon Final Report*, *supra* note 9, app O, at O-11 to O-12.

<sup>234</sup> See Parks, *supra* note 109, at 47. An attacker must exercise reasonable precautions to minimise incidental or collateral damage to the civilian populations or damage to civilian objects, consistent with mission accomplishment and allowable risk to the attacking forces. The defending party must exercise reasonable precautions to separate the civilian populations and civilian objects from military objectives, and avoid placing military objectives in the midst of the civilian population. See *id.* A defender is also expressly prohibited from using the civilian population or civilian objects to shield legitimate targets from attack. See *Pentagon Final Report*, *supra* note 9, app O, at O-14. Iraq had alternative methods available to it. For example, it could have used the provisions in Article 14 of Geneva Convention IV, *supra* note 21, art 14.

'If the attacker is exercising ordinary care to minimise collateral civilian casualties, deaths attributable to the action or inaction of the defender or individual civilian are not the attacker's responsibility.'

Parks, *supra* note 17, at 178. Civilians, for example, cannot be used to make an area immune from attack. They also may not be used to shield military objectives or be forced to leave their homes or shelters to confuse the attacker. See AFP 200-17, *supra* note 100, at 37.

<sup>235</sup> *Pentagon Final Report*, *supra* note 9, app O, at O-12.

<sup>236</sup> *Id.*

Iraq utilized disinformation to claim that any damage was the fault of the Coalition forces.<sup>237</sup> However, “[a]ny evaluation of an attack on the basis of reported civilian casualties is an evaluation based on substantially less than a complete picture, and the whole picture may not be ascertainable until some years later, if ever”.<sup>238</sup> Although battlefield intelligence is becoming more advanced, no military commander has the ability to “locate, identify, or track civilians”.<sup>239</sup> The control and responsibility for the civilian population must be left primarily to the defender. Otherwise, the law of war will be seriously undermined by “encouraging a defender to use civilians as a point of exploitation for tactical and propaganda purposes”.<sup>240</sup>

## CONCLUSION

Acts of war have always been controversial, and the use of precision-guided munitions is not a new topic for debate. Unfortunately, those who demand answers for why the Coalition air campaign did not always use precision weapons in Operation Desert Storm are “seriously flawed in [their] statement[s] of the law of war and the facts surrounding Desert Storm operations”.<sup>241</sup>

The applicable law of war only precludes an attacker from indiscriminately bombing the civilian population. The law of war prohibits attacking civilian objects not militarily significant and directly attacking civilians not participating in the hostilities. The Coalition forces

adhered to these fundamental law of war proscriptions in conducting military operations during Operation Desert Storm through discriminating target selection and careful matching of available forces and weapons systems to selected targets and Iraqi defenses, without regard to Iraqi violations of its law of war obligations toward the civilian population and civilian objects.<sup>242</sup>

Requiring a nation with precision capability to use it in times of war to minimize collateral civilian casualties and collateral damage to civilian objects is inconsistent with the law of war. That law recognizes (1) that the defender has the primary obligation for protection of the civilian population; and (2) that even precision-guided missiles are not the best weapons to use in all circumstances. As James Burton, the retired Pentagon weapons testing official who prepared a 1985 report to the Defense Science Board, declared: “When [precision missiles] work, results are often

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<sup>237</sup> *Id.*

<sup>238</sup> Parks, *supra* note 17, at 181. On 11 Feb 1990, for example, the mosque at Al-Basrah was dismantled by the Iraqis to convey the impression that it had been damaged by a Coalition strike:

US authorities noted there was no damage to the minaret, courtyard building, or dome foundation which would have been present had the building been struck by Coalition munitions. The nearest bomb crater was outside the facility, the result of an air strike directed against a nearby military target on 30 January.

*Pentagon Final Report*, *supra* note 9, app O, at O-12.

<sup>239</sup> Parks, *supra* note 17, at 181.

<sup>240</sup> *Id.*

<sup>241</sup> Memorandum by W. Hays Parks, Chief of International Law, US Army, Guidance for Responses to Inquiries Concerning the Middle East Watch on the Gulf War I (on file with The George Washington Journal of International Law and Economics).

<sup>242</sup> *Pentagon Final Report*, *supra* note 9, app O, ay O-9.

spectacular. When they don't work, results are disastrous because the munitions can miss their target by a mile or more".<sup>243</sup>

Operation Desert Storm was the most discriminate campaign in history, and Coalition forces took risks with their own airmen that they were not obliged to take in order to minimize civilian casualties and damage to civilian objects. Parties to conflicts are not required to use their most discriminating weaponry according to the current law of war which recognizes that the most precise means may not always be the most effective to minimize collateral civilian injury and damage.

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<sup>243</sup> Smith & Richards, *supra* note 180, at A31.