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## A False Sense of Security?

A Critical Analysis of the Civilian Protection Against Attacks  
on Nuclear Power Plants in International Armed Conflicts

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# Contents

<b>SUMMARY</b>	<b>1</b>
<b>SAMMANFATTNING</b>	<b>3</b>
<b>1 INTRODUCTION</b>	<b>5</b>
1.1 BACKGROUND	5
1.2 PURPOSE AND RESEARCH QUESTIONS	6
1.3 METHOD, MATERIAL AND PERSPECTIVE	6
1.4 STRUCTURE	7
1.5 DELIMITATIONS	8
1.6 PREVIOUS RESEARCH	8
<b>2 VALID LAW</b>	<b>9</b>
2.1 GENERAL PROTECTION PROVIDED BY ARTICLE 52	9
2.1.1 <i>Military objectives</i>	9
2.1.2 <i>Military practice by States</i>	11
2.2 SPECIAL PROTECTION PROVIDED BY ARTICLE 56	13
2.2.1 <i>Nuclear electrical generating stations</i>	14
2.2.2 <i>Severe losses</i>	15
2.2.3 <i>Cessation of the special protection</i>	16
2.3 PROTECTION PROVIDED BY THE PRINCIPLE OF PROPORTIONALITY	19
2.3.1 <i>Interpretation by States</i>	19
<b>3 DISCUSSION AND CONCLUSION</b>	<b>23</b>
3.1 DISCUSSION	23
3.2 CONCLUSION	26
<b>BIBLIOGRAPHY</b>	<b>28</b>

# Summary

In light of the warfare between Russia and Ukraine around the nuclear power plant in Zaphorizhzhya, many wonder how civilians today are protected against a potential nuclear disaster caused by war. The aim of this thesis is therefore to investigate which regulations there are to protect civilians against military attacks on nuclear power plants in international armed conflicts, as well as to examine the aforementioned regulations' efficacy in protecting civilians. Therefore, the different layers of protection stipulated in the Additional Protocol I to the Geneva Conventions are thoroughly examined and criticized from the perspective of civilians. The thesis employs a critical legal dogmatic method in its main body to outline and examine the different protections stipulated in Additional Protocol I, using the acknowledged sources of international law. In its final section, the paper engages in a normative discussion around the outlined valid law to assess the efficacy of the protections from a civilian perspective.

The results of the investigation finds that there are three distinct layers of protection against attacks on nuclear power plants stipulated in Additional Protocol I, all of which have complex and highly nuanced formulations. The first layer of protection is *the protection of civilian objects*. If the plant is not considered a civilian object, but a military one, there is a secondary layer of protection, namely *the special protection of nuclear electrical generating stations*. If the special protection ceases or is not applicable, the remaining protection is granted by *the principle of proportionality*. The common denominator for each layer of protection is their fairly vague character, which provides States with a wide margin of discretion in their interpretation of each provision and their interplay. Ultimately, the protections' efficacy is therefore dependent on a State's willingness to interpret the provisions in favor of the civilian interest. However, efforts made to further expand or fortify the current protection by entering into new agreements have consistently failed, indicating an unwillingness of States to prioritize civilian safety over a potential military advantage gained from an attack. Therefore, it is concluded that the

civilian protection against attacks on nuclear power plants is largely ineffective and unpredictable for civilians.

# Sammanfattning

Mot bakgrund av kriget mellan Ryssland och Ukraina i närheten av kärnkraftverket i Zaporizjzja frågar sig många hur civilbefolkningar i dag är skyddade mot en potentiell kärnkraftskatastrof orsakad av krig. Syftet med denna uppsats är således att undersöka vilka bestämmelser som finns för att skydda civila mot militära attacker på kärnkraftverk i internationella väpnade konflikter, samt att undersöka hur effektivt de nämnda bestämmelserna skyddar civila. Därför undersöks och kritiseras grundligt de olika skyddsnivåer som föreskrivs i Tilläggsprotokoll I till Genèvekonventionerna ur ett civilt perspektiv. I uppsatsens undersökande del används en kritisk rättsdogmatisk metod för att beskriva och granska, med hjälp av erkända folkrättsliga källor, de olika skydd som föreskrivs i Tilläggsprotokoll I. I det sista avsnittet nyttjar uppsatsen en normativ diskussion kring den gällande rätten för att bedöma skyddets effektivitet ur ett civilt perspektiv.

Uppsatsens resultat visar att det finns tre olika nivåer av skydd mot attacker på kärnkraftverk enligt Tilläggsprotokoll I och alla dessa innehåller komplexa och rikt nyanserade formuleringar. Den första nivån av skydd är *skyddet av civila objekt*. Om kärnkraftverket inte anses vara ett civilt objekt utan ett militärt sådant finns det en sekundär skyddsnivå, nämligen det *särskilda skyddet av kärnkraftverk*. Om det särskilda skyddet inte är tillämpligt eller upphör, är det återstående och slutgiltiga skyddet av kärnkraftverk genom *proportionalitetsprincipen*. Den gemensamma nämnaren för varje skyddsnivå är att de är tämligen vaga till sin utformning, vilket innebär att stater har ett stort tolkningsutrymme vid tydningen av de enskilda bestämmelserna och deras samspel. I slutändan beror därför skyddets effektivitet på staternas vilja att tolka bestämmelserna till förmån för det civila intresset. Emellertid har försök att ytterligare utvidga eller förstärka det nuvarande skyddet genom att ingå nya avtal konsekvent misslyckats, vilket tyder på att stater är ovilliga att prioritera civilbefolkningens säkerhet framför den potentiella militära fördelen en attack kan innebära. Följaktligen dras slutsatsen att det civila skyddet mot attacker på kärnkraftverk i stort sett är ineffektivt och oförutsebart för civilbefolkningar.

# Abbreviations

IHL	International Humanitarian Law
AP-I	Additional Protocol I to the Geneva Conventions
USA	United States of America
UK	United Kingdom
ICRC	International Committee of the Red Cross
ICTY	International Criminal Tribunal for the Former Yugoslavia
IAEA	International Atomic Energy Agency
Draft Rules	Draft Rules for the Limitation of the Dangers incurred by the Civilian Population in Time of War

# 1 Introduction

## 1.1 Background

When reports of attacks on the Zaporizhzhya nuclear power plant in March of 2022 became public, leaders and citizens of the world became frightened.<sup>1</sup> Neither Moscow nor Kyiv took proper responsibility for the attacks, but fortunately no nuclear reactor was harmed in the commotion as fires were extinguished and a potential disaster was successfully prevented.<sup>2</sup> However, in a post-Chernobyl world, concerns grew as to how people are protected against yet another nuclear disaster – this time caused by the recklessness at play during the modern day Russia-Ukraine war.<sup>3</sup>

The head of the IAEA have released reiterating statements underlining the severeness of the military action around Zaporizhzhya and the potential consequences of a full-on attack on the plant.<sup>4</sup> Not only could a military attack on nuclear power plants result in immediate civilian fatalities, but it could also cause massive public health damage and forced civilian relocation or displacement in the subsequent years due to widespread radiation, as illustrated by the Chernobyl disaster's aftermath.<sup>5</sup>

With tensions continuing to rise and circumstances shifting frequently in the Russia-Ukraine conflict, questions have arisen as to how civilian populations in international armed conflicts are protected under IHL from military attacks on nuclear power plants and its potentially devastating effects.

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<sup>1</sup> Reuters, *Russia blames attack at nuclear power station on Ukrainian saboteurs* (2022)

<sup>2</sup> Lister, et al., *Ukrainian nuclear power plant attack condemned as Russian troops 'occupy' facility* (2022)

<sup>3</sup> Moore, *How international law applies to attacks on nuclear and associated facilities in Ukraine* (2022)

<sup>4</sup> Gigova, Berlinger, *IAEA warns whoever was behind 'powerful explosions' at Zaporizhzhia nuclear plant is 'playing with fire'* (2022)

<sup>5</sup> World Nuclear Organization, *Chernobyl Accident 1986*, Available at: <https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/chernobyl-accident.aspx>

## 1.2 Purpose and research questions

This essay's purpose is to investigate and outline the existing protection, granted to civilians under International Humanitarian Law, from the devastating effects of military attacks on nuclear power plants in international armed conflicts, using valid law prescribed in the Additional Protocol I to the Geneva Conventions. The essay also aims to assess the regulations' efficacy in protecting civilians. Efficacy will be determined by examining the opportunities for discretion provided by the regulations' design, which may hinder the successful application of the protection as well as affect the protection's predictability from a civilian perspective.

The research questions are the following:

1. Which regulations are there protecting civilians from the effects of military attacks on nuclear power plants in IHL, and when do they come into effect?
2. To what extent are the outlined regulations effective in protecting civilians?

## 1.3 Method, material and perspective

The legal dogmatic method is a way of interpreting, establishing and systematizing valid law using acknowledged sources. Legal dogmatics can also entail arguments of *de lege ferenda* character to the extent the arguments are an elaboration on the analysis of valid law. A legal dogmatic method does not, however, entail declarations of the effects of valid law nor legal political argumentation. Such reasoning is instead fitting when applying the legal analytical method where arguments are not as bound to the recognized sources.<sup>6</sup>

In order to answer the research questions posed, this essay employs a critical legal dogmatic method using *de lege lata* to outline the valid law from recognized sources. The recognized sources of international law include treaties,

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<sup>6</sup> Sandgren (2021), p. 51-53



international customary law, general principles of international law, judicial decisions and legal doctrine.<sup>7</sup> The relevant source regulating civilian protection in international armed conflicts is the Additional Protocol I to the Geneva Conventions. AP-I is a treaty and is consequently the main recognized source used in this essay.

Other sources used to analyze AP-I's application and outline the valid law are general principles of international law and legal doctrine. The main principle used is the proportionality principle which permeates the universal application of IHL.<sup>8</sup> Legal doctrine, on the other hand, is not binding per se. Still, legal doctrine is a valuable tool when determining the difference in opinion, as well as general consensus, on AP-I's application. The doctrine used in this essay is produced by doctors, professors and experts in the field of IHL, who are voices of great authority on the subject matter of this essay.<sup>9</sup>

Furthermore, the concluding normative discussion utilizes a legal analytical method by presenting arguments of *de lege ferenda* character when criticizing the efficacy of the outlined valid law from a civilian perspective. The essay also employs an international perspective throughout, as official military manuals from different States are examined, discussed and compared in order to get a broad sense of the valid law and to emphasize differences in interpretations by States.<sup>10</sup>

## 1.4 Structure

Initially, the main body of the essay outlines the different protections granted to civilians by Additional Protocol I, and is divided into three sections. The first section examines the general protection of civilian objects against military attacks according to Article 52 of AP-I in relation to nuclear power plants. The second section examines the special protection granted to nuclear electrical generating stations against military attacks according to Article 56

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<sup>7</sup> Statute of the International Court of Justice, Art. 38

<sup>8</sup> Maroonian, *Proportionality in International Humanitarian Law: A principle and a rule* (2022)

<sup>9</sup> See Chapter 4

<sup>10</sup> Korling, Zamboni (ed.) (2013), p. 141

of AP-I. The third section explores the protection granted by the proportionality principle in situations where the general and special protection are not applicable. Lastly, the final concluding section contains a critical discussion around the findings in the previous sections.

## 1.5 Delimitations

The scope of this study is limited to examining the civilian protection, granted by the Additional Protocol I, in international armed conflicts. Therefore, regulations protecting the environment from attacks on nuclear power plants will not be examined. Furthermore, the Protocol's status as customary international law will not be carefully examined. Additional Protocol II, which regulates civilian protection during non-international armed conflicts, will not be explored due to the international perspective and nature of the essay. Moreover, the essay does not intend to make a case study of the current Russia-Ukraine conflict around Zaporizhzhya considering the everchanging circumstances of the conflict. Additionally, bilateral treaties regulating protection will not be explored as they are only binding for the two States signing the treaty. Finally, the "use of force" as a *jus cogens* norm, the Martens clause, practical enforceability of AP-I by judicial organs, as well as matters of State responsibility, will not be addressed due to the limited nature of this thesis.

## 1.6 Previous research

Previous comprehensive research made about the protection of civilians against attacks on nuclear power plants according to AP-I is limited. AP-I has been investigated by some scholars within the field of IHL, such as Michael Bothe with his most notable contribution being *New Rules for Victims of Armed Conflicts* where he explores the commentary and application of AP-I.<sup>11</sup> However, most previous research is limited to investigations into the general application of AP-I as a whole, and not specifically in relation to nuclear power plants.

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<sup>11</sup> See Chapter 4

## **2 Valid law**

### **2.1 General protection provided by Article 52**

The Additional Protocol I of 1977 to the Geneva Conventions is a vital part of what the international community regards as IHL and is commonly considered international customary law.<sup>12</sup> AP-I specifically aims to achieve protection for victims of international armed conflict, i.e. civilians and civilian objects.<sup>13</sup> Therefore, when discussing the protection granted to civilians under IHL from attacks on nuclear power plants, it is necessary to examine AP-I and its regulations detailing permitted military objectives.

#### **2.1.1 Military objectives**

The principle of distinction and Article 52 of AP-I state that military objectives are the only legitimate targets for military attack, as opposed to civilian objects.<sup>14</sup> If a nuclear power plant qualifies as a civilian object according to Article 52, it may therefore not be attacked. This is the first layer of protection for nuclear power plants. Therefore, it is important to define the qualifications needed for the plant to be considered a civilian object.

According to paragraph 1 of Article 52, an object which cannot be qualified as a military objective according to paragraph 2 in Article 52 qualifies as a civilian object. In order for a nuclear power plant to be qualified as a military objective, according to paragraph 2, it has to (1) by its nature, location, purpose or use make an effective contribution to military action and (2) by its total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offer a definite military advantage.

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<sup>12</sup> Cuénoud, *40th Anniversary of the Additional Protocols of 1977 of the Geneva Conventions* (2017)

<sup>13</sup> See Art. 1 of AP-I

<sup>14</sup> Henckaerts, Doswald-Beck (2005a), p. 25

The general protection's purpose is to display that civilian destruction not necessary to the attainment of a military advantage is prohibited.<sup>15</sup> However, civilian safety is not a factor when determining whether the object is military. The Article does not explicitly state the civilian interest but instead focuses on "the effective contribution to military action" and "military advantage". This has led to objects being regarded as military objectives even when they are not military objects *prima facie*, such as activities providing only logistical support to military operations.<sup>16</sup>

There are, however, supposed limitations to the attackers' discretion in defining military objectives. For example, the second part of the two-pronged test for qualification states that the military advantage gained has to be "definite". This adjective indicates that there should be a concrete and perceptible military advantage, rather than a hypothetical or speculative one.<sup>17</sup> Another limitation to the discretion of the attacker is the prerequisite that the military advantage must be present "in the circumstances ruling at the time". Therefore, the destruction of an objective which may have given a military advantage at an earlier point in time cannot be used for qualification if the military advantage is no longer actual.<sup>18</sup>

However, the provision has acquired criticism for its deficient assistance in defining military objectives and for giving rise to arbitrary and divergent interpretations. Critics of the provision consider the language to be too ambiguous, encouraging abuse in the interpretation of the article by military commanders to their own military advantage.<sup>19</sup> Many have therefore called for the distinction between military objectives and civilian objects to be made more precise and that there should exist an exhaustive list of military objectives.<sup>20</sup>

A non-exhaustive list exemplifying important categories of military objects was initially proposed by the ICRC in its Annex to the Draft Rules of 1956,

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<sup>15</sup> Bothe, et al. (2013), p. 362

<sup>16</sup> Ibid. p. 365

<sup>17</sup> Ibid. p. 367

<sup>18</sup> Ibid. p. 367

<sup>19</sup> Rosenblad (1977), p. 71

<sup>20</sup> Fleck (ed.) (2008), p. 181

but was rejected at the Diplomatic Conference because States present could not reach a consensus on how the list should be constructed. The list of examples drafted by the ICRC is, however, considered a precedent of the general understanding of the article and can therefore be used as an interpretative aid.<sup>21</sup> The most relevant category listed in the Annex when examining nuclear power plants is “commercial objectives making an effective contribution to military action”. It is debated what is actually covered by this category, but it explicitly includes industries of fundamental importance for the conduct of war, such as installations for the production of energy (e.g. nuclear electricity) for mainly military purposes.<sup>22</sup>

Installations for the production of energy for mainly military purposes, are regarded as undisputed military objectives.<sup>23</sup> There are, however, considerable issues with ascertaining the flow of electricity in a complex interconnected electrical grid with multiple power sources and substations.<sup>24</sup> Determining whether electricity generated from a specific power plant is used for mainly military purposes is therefore challenging. Nevertheless, a determination of the electricity’s use is a vital part in defining nuclear power plants as military objectives.

## **2.1.2 Military practice by States**

While the exemplifying list in the Draft Rules’ Annex may be considered an interpretive aid when examining military objectives, it is enlightening to consider States’ explicit interpretations of Article 52 in their own military manuals.

Germany’s military manual incorporates Article 52 in its entirety, with an additional list of examples resembling the one in the Draft Rules’ Annex. It states that “economic targets such as [...] industrial plants [...] which contrib-

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<sup>21</sup> Fleck (ed.) (2008), p. 181

<sup>22</sup> Ibid. p. 183-184

<sup>23</sup> Ibid. p. 183-184

<sup>24</sup> Parks (1990), p. 141 n. 415

ute effectively to military activities” are specifically considered military objects.<sup>25</sup> The example gives some guidance in interpreting the Article but only to the same extent as the Draft Rules’ Annex.

Denmark’s manual, on the other hand, provides a different interpretation. It states that an object which is put to civilian and military use simultaneously may become a lawful military objectives, even if the object’s primary use is civilian, so long as it offers a direct military advantage for the attacker.<sup>26</sup> This is a departure from the Draft Rules’ definition which states that the main purpose of the production of electricity has to be military in order for the power plant to be considered a military object. Therefore, according to Denmark, power plants are generally seen as military objectives, no matter the small extent of military purpose.

The USA has, unlike Germany and Denmark, not ratified, but merely signed AP-I.<sup>27</sup> They are, therefore, generally not bound by it but have nonetheless decided to incorporate Article 52 into their military manual. The manual gives aid in interpreting the Article by stating that they generally recognize electric power stations to be of sufficient importance to a State’s capacity to meet its wartime needs so as to regularly be qualified as military objectives.<sup>28</sup> The USA base this interpretation on statements made by the Eritrea-Ethiopia Claims Commission.<sup>29</sup> The Commission states that, in order for power plants to *not*<sup>30</sup> be regarded as military objectives, they have to be segregated from a general power grid and be limited to only supplying power for humanitarian purposes, such as medical facilities, or other uses that could have no effect on the State’s ability to wage war.<sup>31</sup> As opposed to the definition in the Draft

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<sup>25</sup> Bundesministerium der Verteidigung (2013), *Law of Armed Conflict Manual*, p. 54, para. 407 [cit. DE-Manual]

<sup>26</sup> Danish Ministry of Defense (2020), *Military Manual*, p. 300 [cit. DK-Manual]

<sup>27</sup> ICRC, *IHL Database*, available at: <https://ihl-databases.icrc.org/en/ihl-treaties/apii-1977/state-parties>

<sup>28</sup> Department of Defense (2016), *Law of War Manual*, p. 2019, para. 5.6.8.5 [cit. US-Manual]

<sup>29</sup> Permanent Court of Arbitration, *Eritrea-Ethiopia Claims Commission*, available at: <https://pca-cpa.org/en/cases/71/>

<sup>30</sup> My own italicization.

<sup>31</sup> Eritrea-Ethiopia Claims Commission, *Partial Award: Western Front, Aerial Bombardment and Related Claims* (2004), p. 334, para. 117

Rules stating that power plants are considered military objects only if they produce electricity for mainly military purposes, the Commission says that power plants are considered military objectives even if they produce electricity for military purposes only to a small extent, thereby establishing a wider range of permissible military objectives.

The different interpretation techniques put forth by States' are unsurprising considering the vague definition of military objectives and the difficulty in reaching consensus when creating the article. From the samples of military manuals examined it can therefore be deduced that Article 52 provides States much discretion in their interpretation, leading to a rather unpredictable general protection of nuclear power plants. However, if a nuclear power plant is considered a military objective, there is special layer of protection prescribed in Article 56 of AP-I.

## **2.2 Special protection provided by Article 56**

Article 56 of AP-I offers a special protection against attacks on works and installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations, from military attack. Before AP-I's creation, public opinion had reacted negatively against such means of warfare which was utilized during the Second World War and the Vietnam War.<sup>32</sup> The civilian losses were deemed too excessive and disproportionate in relation to the military advantage gained by the attacks.<sup>33</sup> Therefore the ICRC proposed a protection of the works and installations, which was debated heavily among the Steering Committee for Human Rights.<sup>34</sup> When the decision was made to limit special protection to namely dams, dykes and nuclear electrical power stations, a generally acceptable text was produced.<sup>35</sup> Other installations were

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<sup>32</sup> Bothe, et al. (2013), p. 393

<sup>33</sup> Ibid. p. 393

<sup>34</sup> Pilloud, et al. (1987), para. 2145

<sup>35</sup> Bothe, et al. (2013), p. 395

considered in the debates but were ultimately denied special protection.<sup>36</sup> The list of works and installations in Article 56 is therefore exhaustive.

The adopted Article 56 states in its first paragraph that nuclear electrical generating stations shall not be made the object of attack, even where these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population.

## **2.2.1 Nuclear electrical generating stations**

The scope of application being limited to “nuclear electrical generating station” is the subject of debate among experts in the field of IHL and it is therefore important to determine what the definition entails.<sup>37</sup>

Firstly, the definition only addresses one segment of the nuclear fuel cycle, namely the electricity producing one. Other fuel cycle installations containing large inventories of radioactivity, such as nuclear spent fuel storage, reprocessing plants and fabrication facilities, are not addressed and not protected by Article 56.<sup>38</sup>

Secondly, the definition excludes nuclear facilities being used for any other purpose than generating power, such as nuclear research facilities, even if the research facility in question has a dual purpose in also producing electricity.<sup>39</sup> The sheer number and power of nuclear research reactors, as well as their proximity to densely populated areas, make it probable that attacks against them will cause severe losses among the civilian population. On the other hand, some research facilities are occasionally used for the research and manufacturing of nuclear weapons. Such research facilities have become the objects of attack due to the suspicion that nuclear materials were used for military purposes and were considered justified.<sup>40</sup> The legality of attacking nu-

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<sup>36</sup> Pilloud, et al. (1987), para. 2149

<sup>37</sup> Lamm (2003), p. 1-3

<sup>38</sup> Ramberg (1982), p. 665,

<sup>39</sup> Parks (1990), p. 210

<sup>40</sup> Lamm (2003), p. 5



clear research facilities have generally not been contested by States, thus setting the standard for such facilities to be without the protection of Article 56 even if they conduct research for peaceful purposes.<sup>41</sup>

A proposal to expand the scope of application was introduced by Sweden during the disarmament talks at the end of the 1970s. Sweden proposed a draft prohibiting attacks on all nuclear facilities containing sufficient radioactive material to cause mass destruction if released, for example reprocessing plants and large deposits of radioactive waste, covering all parts of the nuclear fuel cycle as well as research facilities.<sup>42</sup> The USA and their allies have, however, refused to accept this draft as it poses practical problems such as “legitimate” military objectives being protected if radiation in any amount would be released from an attack.<sup>43</sup> It is therefore improbable that, in the near future, the scope of application will be extended to include nuclear facilities other than nuclear electrical generating stations. The article does, however, in its 6<sup>th</sup> paragraph, encourage States to enter into further agreements to extend protection for objects containing dangerous forces, a way for other objects than those listed to be granted protection. Although, as illustrated by Sweden’s unsuccessful attempt at doing so, a mere encouragement is presumably not efficient in expanding the protection.

## **2.2.2 Severe losses**

Another prerequisite needed in order for the special protection to come into effect is that an attack on the nuclear electrical generating station must be anticipated to cause the release of dangerous forces and consequent severe losses among the civilian population. If such an attack would not cause severe losses it is legitimate, provided that the nuclear power plant is a military objective.<sup>44</sup> In other words, if severe civilian losses are foreseeable, the attack is prohibited.

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<sup>41</sup> Lamm (2003), p. 5

<sup>42</sup> Ibid. p. 5

<sup>43</sup> Ibid. p. 5

<sup>44</sup> Pilloud, et al. (1987), para. 2153

The concept “severe losses” is regarded to be a matter of common sense and must be applied on the basis of objective elements, such as the proximity of inhabited areas, the population density and the lie of the land.<sup>45</sup> The prohibition is, therefore, not applicable to an installation where relatively few civilians would be affected.<sup>46</sup> “Severe losses” has been a disputed matter among some States who have objected to the article, such as the USA, the UK and France.<sup>47</sup> The aforementioned States believe the object’s military value is not being adequately weighed against the civilian losses and they consider it unclear what level of civilian losses would be deemed “severe”.<sup>48</sup> The USA considers this a deviation from the proportionality principle and, therefore, does not consider the Article reflective of customary international law.<sup>49</sup> However, most States, such as Denmark and Germany, have adopted Article 56 in its entirety without reservations.<sup>50</sup> Furthermore, the argument of proportionality not being adequately applied might be rendered hollow due to the opportunity of cessation stipulated in the Article’s second paragraph.

### **2.2.3 Cessation of the special protection**

The second paragraph of Article 56 states that the special protection against attacks on nuclear electrical generating station shall cease only if (1) it provides electric power in regular, significant and direct support of military operations and if (2) such attack is the only feasible way to terminate such support. The provision makes it possible to execute an attack on nuclear power plants, even if an attack would lead to severe losses among the civilian population, if the requirements in the second paragraph are met.

There is no strict consensus on what is meant by “military operations” in this context. Some argue that it can cover factories producing armaments, ammunition and military equipment, while other consider this interpretation to be

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<sup>45</sup> Pilloud, et al. (1987), para. 2154

<sup>46</sup> Bothe, et al. (2013), p. 396

<sup>47</sup> Henckaerts, Doswald-Beck (2005b), p. 815

<sup>48</sup> US-Manual (2016), p. 271, n. 423-424

<sup>49</sup> Ibid. p. 270

<sup>50</sup> See DK-Manual (2020), p. 210, DE-Manual (2013), p. 59

excessive and should have been stated explicitly if that was the intended interpretation.<sup>51</sup> There is, however, a general consensus in that the expression does not cover the production of civilian objects even if they are also used by the armed forces.<sup>52</sup>

The triple qualification “regular, significant and direct support” is meant to be interpreted in good faith with common sense on the basis of objective elements. “Regular” means that the support has to be somewhat continuous, whereas “significant” means that the support should have a sizeable impact.<sup>53</sup> “Direct” means that electricity produced has to be closely related to the military operations.<sup>54</sup> One example fulfilling the triple qualification is the support of electricity to armaments production.<sup>55</sup> However, the issue of determining electricity flow in an interconnected electricity grid is once again apparent and has been considered problematic by States during the Article’s creation.<sup>56</sup> It is also unclear as to how the assessments differ when evaluating, on one hand, the triple qualification needed for the special protection’s cessation, and, on the other hand, the prerequisites “effective contribution to military action” and “definite military advantage” when defining military objectives. Theoretically, the assessment of the triple qualification is supposed to be of a higher standard than the one in defining military objectives.<sup>57</sup> However, it is unclear as to how the standard differs considering the basis of both assessments evidently being military support to a meaningful degree.

In order for the protection to cease, an attack also has to be the only feasible way to terminate the previously mentioned support to military operations. This prerequisite mainly concentrates on situations where attacks on other targets, such as electrical substations and transformers, can be an alternative to the attack on nuclear power plants.<sup>58</sup> The electricity produced at power plants reaches many substations on its delivery route before reaching its final

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<sup>51</sup> Pilloud, et al. (1987), para. 2165

<sup>52</sup> Ibid. para. 2165

<sup>53</sup> Ibid.

<sup>54</sup> Ibid.

<sup>55</sup> Ibid.

<sup>56</sup> Bothe, et al. (2013), p. 398

<sup>57</sup> Ibid. p. 397

<sup>58</sup> Pilloud, et al. (1987), para. 2166

destination.<sup>59</sup> These substations are vital to the electrical grid and the issue of mapping out the flow of electricity in an integrated electrical grid is an issue here as well. Therefore, in order to stop all the electricity produced at the plant from reaching its destinations, attacking every substation in the grid connected to the power plant might be necessary. However, substations are usually connectors between different plants and outlets.<sup>60</sup> Destroying substations could therefore be harmful to civilians because it may terminate power produced by not only the nuclear power plant but also by other power plants, by disrupting the electricity flow in the grid.<sup>61</sup> During winter months when electrical heating might be necessary for survival, such an act could result in severe losses among the civilian population and may, therefore, be a violation of the proportionality principle.<sup>62</sup> However, determining collateral damage is a difficult task in practice, especially being a belligerent State with not much insight into the opposing State's electrical grids. If an attack on the electrical grid would be in violation of the principle of proportionality, the only feasible way of terminating military support provided by the nuclear power plant might be to attack the plant.

In conclusion, the special protection is far from absolute and offers States the opportunity of discretion in their interpretation of the Article. Military manuals of the USA, Denmark and Germany do not explicitly state how the provision on cessation should be interpreted and it is therefore unclear as to the procedure of States in regard to the provision. Still, it is not inconceivable that an attack on a nuclear power plant can be permitted, even under the special protection of Article 56. However, the Article's third paragraph emphasizes that civilians shall remain entitled to all the protection accorded to them by international law, referring implicitly to Articles 51 and 57.<sup>63</sup>

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<sup>59</sup> University of Calgary, *Electrical transmission*, Available at: [https://energyeducation.ca/encyclopedia/Electrical\\_transmission](https://energyeducation.ca/encyclopedia/Electrical_transmission)

<sup>60</sup> Ibid.

<sup>61</sup> For visual guidance, see: Circuit Globe, *Electrical Grid*, Available at: <https://circuitglobe.com/electrical-grid.html>

<sup>62</sup> See 2.3 below.

<sup>63</sup> Pilloud, et al. (1987), para. 2169

## 2.3 Protection provided by the principle of proportionality

If the conditions for cessation of special protection are all met, the remaining protection granted to civilians by AP-I is stipulated in Articles 51 and 57. Article 51 paragraph 5(b) defines an indiscriminate attack as one that causes excessive civilian damage in relation to the concrete and direct military advantage anticipated. Article 57 instead states that precautions need to be taken to avoid excessive collateral damage. These articles are considered implicitly representative of the proportionality principle which expresses the responsibility to balance the expected civilian losses with the anticipated military advantage gained from the attack on the military objective.<sup>64</sup> The term “proportionality” is not mentioned in AP-I because some States opposed the principle during AP-I’s creation, arguing that it was too permissive and would give States the right to launch attacks if they thought there would be a military advantage to gain from it.<sup>65</sup> Other States supported the principle for that very reason, arguing that the principle was needed for the laws of war to be realistic and applicable.<sup>66</sup> The UK argued that an attack on a valuable military objective would, in practice, not be hindered by the presence of a few civilians, even if it was prohibited according to AP-I. Therefore, AP-I would be rendered generally ineffective if the proportionality principle was not implemented throughout.<sup>67</sup> Despite the caution taken when codifying the principle in AP-I, the codification was one of the central reasons States hesitated to ratify the Protocol, arguing that the provisions were misguided in placing excessive responsibility on the attacking State to avoid civilian casualties.<sup>68</sup> However, all States are nonetheless bound by the principle as international customary law.<sup>69</sup>

### 2.3.1 Interpretation by States

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<sup>64</sup> Pilloud, et al. (1987), para. 2169

<sup>65</sup> Official Records of the Diplomatic Conference, p. 61-64

<sup>66</sup> Ibid. p. 61-64

<sup>67</sup> Ibid. p. 61-64

<sup>68</sup> Parks (1990), p. 112, 173-177

<sup>69</sup> Rogers (ed.) (2022), p. 251

The principle is central to the structure and purpose of IHL, despite the fact that military advantage and civilian damage are subjective elements. States' interpretations of the principle are often wide-ranging with varying emphasis on military advantage and civilian protection.<sup>70</sup> The difficulties of interpretation were well-formulated by the ICTY in June of 2000:

The main problem with the principle of proportionality is not whether or not it exists but what it means and how it is to be applied. It is relatively simple to state that there must be an acceptable relation between the legitimate destructive effect and undesirable collateral effects. [...] Unfortunately, most applications of the principle of proportionality are not quite so clear cut. It is much easier to formulate the principle of proportionality in general terms than it is to apply it to a particular set of circumstances because the comparison is often between unlike quantities and values. One cannot easily assess the value of innocent human lives as opposed to capturing a particular military objective.<sup>71</sup>

The difficulties in applying the principle can be illustrated by how different States interpret "civilian damage". The USA interprets the damage as only immediate and direct civilian losses, and not remote losses. They base this reasoning on the difficulty in accurately predicting the myriad of remote damages which may spring from an attack.<sup>72</sup> The USA do not state their view on remote losses caused by attacks on nuclear power plants openly, but, with their explicit reasoning on remote losses in mind, it is perhaps conceivable that losses caused by the widespread radiation in subsequent years after an attack may not be considered in their proportionality assessment. For example, the immediate and direct losses of the Chernobyl disaster was thirty lives

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<sup>70</sup> Newton, May (2014), p. 28–29

<sup>71</sup> ICTY, *Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia* (2000), para. 48

<sup>72</sup> US-Manual (2016), p. 262

in total. However, only considering these deaths when determining the civilian damage, and not the pronounced damage in the subsequent years, would be a misleading assessment.<sup>73</sup>

In contrast, Denmark interprets civilian damage as such damage attributable to the attack as long as it's foreseeable, allowing a broader definition to take place. They explicitly state that long-term effects need to be taken into account and this applies, in particular, to widespread and long-term damage prejudicing the health or survival of the population.<sup>74</sup> This clearly indicates that long-term radiation would be considered in the assessment made by Denmark.

In the USA's assessment of whether the civilian harm is excessive in relation to the military advantage, the totality of the circumstances are considered. This holistic judgment considers any relevant moral, legal, and military factors. In less clear cases, where the question of whether the expected civilian harm is excessive is open-ended, the answer may be subjective and imprecise. For that reason, the USA have chosen to apply a "clearly excessive" standard for determining whether a violation of the proportionality principle has occurred.<sup>75</sup> Choosing to interpret the principle in this manner in situations of doubt, instead of in favor of civilian safety, indicates a prioritization of the military advantage by the USA.

Denmark, on the other hand, states that the identification of the relationship between collateral damage and military advantages, i.e., the actual comparison between these two considerations, is ultimately based on an estimate. This estimate is to be made on the basis of a factual assessment of the information available and in good faith.<sup>76</sup> It is not clear what is meant by "good faith" in the Danish context nor if this means that an interpretation should, in doubt,

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<sup>73</sup> World Nuclear Organization, *Chernobyl Accident 1986* (2022), Available at: <https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/chernobyl-accident.aspx>

<sup>74</sup> DK-Manual (2020), p. 311

<sup>75</sup> US-Manual (2016), p. 266

<sup>76</sup> DK-Manual (2020), p. 314-315

favor the civilian interest. In contrast, Germany does not state how it interprets the proportionality principle whatsoever, merely stating the importance of adherence to the principle.<sup>77</sup>

The States' different interpretations, or lack thereof, further fortifies the ICTY's observations relating to the difficulties when applying the principle in practice, illustrating that a comparison between dissimilar values and ever-changing concrete circumstances is far from an easy task.

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<sup>77</sup> DE-Manual (2013), p. 53 para. 404



## **3 Discussion and conclusion**

### **3.1 Discussion**

The main regulations in IHL protecting civilians from military attacks on nuclear power plants include the general protection of civilian objects, the special protection of nuclear electrical generating stations and the principle of proportionality. These protections are stipulated in Articles 52, 56, 51 and 57 of AP-I, respectively. However, the application of the protections is evidently complicated and difficult to decipher.

As previously examined, the first protection granted to civilians by AP-I is the general protection of Article 52. The general protection prohibits all attacks against civilian objects, which include all objects not considered military objectives. As previously stated, the issue comes with defining military objectives. The key points of interpretation are the prerequisites “effective contribution to military action” and “military advantage”. The application of these concepts requires knowledge of electricity flow through an interconnected electrical grid, which is knowledge difficult to acquire as a belligerent State. The prerequisites are consistently interpreted differently by States and there does not seem to be a strictly correct procedure when defining military objectives, giving States immense flexibility in their understanding of the definition. Despite the previously examined arguments against it, nuclear power plants are regularly considered undisputed military objectives if they support military action to some extent. Therefore, the general protection granted by Article 52 rarely comes into effect in regards to nuclear power plants.

In cases where a nuclear power plant is considered a military objective according to Article 52, rendering the general protection inapplicable, there is a layer of special protection for “nuclear electrical generating stations” stipulated in Article 56 of AP-I. The interpretation of the term “nuclear electrical generating stations” has been narrow as some facilities of the nuclear fuel cycle do not fall under the definition and are therefore not protected by the Article. Neither are research facilities, even if they produce electricity to some

extent. Therefore, only nuclear facilities with the sole purpose of producing electricity are covered by the definition. Seeing as large quantities of nuclear facilities do not qualify as “nuclear electrical generating stations”, many intense discussions and proposals to expand the scope of application have taken place to further fortify the protection of civilians, which is also encouraged by the Article’s sixth paragraph. Such an expansion of the scope of application is reasonable in order for the Article to fulfill its purpose of civilian protection, at least in regard to the unprotected facilities of the nuclear energy production cycle. However, attempts to expand the protection in this manner have failed due to States’ prioritization of the potential military advantage. The Article’s sixth paragraph clearly illustrates an implied awareness of the narrow scope of application and the need for stronger civilian protection on States’ own accord where the protection gained by Article 56 is deficient. However, as the current formulation of the Article is the one States’ found final agreement on, the collective willingness to further the scope of application further is evidently non-existent, rendering the naive attempt at expanding the protection through paragraph six generally ineffective.

The key prerequisite needed for the special protection to come into effect is that “severe losses” has to be anticipated from the attack. This has been the main reason behind some States’ objections towards the Article. It has been considered too absolute in its protection by not considering the principle of proportionality, and simultaneously too vague by not specifying what is considered “severe”. The alleged vagueness of the term might be justified as there is no precise guidance in how it should be interpreted, only that it is a matter of common sense applied on objective elements relating to the civilians in the area. However, common sense is itself a vague and subjective concept which differs between States. There will therefore be discrepancies between States’ view of how many civilian losses are considered severe as the disregard of collateral damage differs between States.

Furthermore, according to some States’ common sense, an interpretation of “severe losses” inherently needs to involve a proportionality assessment of the military advantage in relation to the civilian losses for it to be deemed

“severe”. Although, such an interpretation would not be made on the intended objective elements and would make the protection less absolute. However, the protection is already far from absolute considering the possibility of cessation of special protection.

If a nuclear power plant overcomes the hurdles previously mentioned and subsequently qualifies for the special protection of Article 56, the protection will cease if the power plant (1) provides electric power in regular, significant and direct support of military operations and (2) if an attack is the only feasible way to terminate such support.

The first part of the two-pronged test faces the same difficulty as the assessment made when defining military objectives according to Article 52, namely ascertaining the electricity flow in an interconnected electricity grid, providing States much discretion in their interpretation. It is also unclear how the understanding of the triple qualification differs from the one made in defining the object as military. Both assessments have to do with determining if the electricity produced at a nuclear power plant provides support of military operations to a meaningful degree. The consequences of the assessments potentially being the same are significant. If the power plant is a military objective according to Article 52 on the basis of significant military support, the next layer of protection is the special protection of Article 56. However, the basis used previously when defining the object as military will also be used for ceasing the special protection in Article 56, in effect rendering the triple qualification useless as an obstacle for cessation. In other words, if the special protection of Article 56 is applicable due to the plant being a military objective according to Article 52, the triple qualification for cessation is already fulfilled. As a result, the only prerequisite preventing the special protection from ceasing is the second part of the two-pronged test stating that an attack must be the only feasible way to terminate such support.

The second part of the two-pronged test for cessation provides, at first glance, the strongest protection for civilians because a State can terminate the military support by instead attacking substations connected to the power plant in the

electricity grid. However, such an attack might be a violation of the proportionality principle as it can disrupt even larger parts of the grid than an attack on a nuclear power plant would, thereby damaging civilians to a great extent. If other ways of terminating the support constitutes breaches of international law, does that mean that an attack on the nuclear power plant is the only feasible way to terminate the support? There is no clear answer as to what the term “feasibility” permits in this situation nor how a situation where two laws clash should be handled, once again leaving it up to interpretation.

The proportionality principle encompasses the whole of IHL and, if the only feasible way of terminating the support is attacks on the nuclear power plant, the remaining protection for civilians against such actions would be that of the principle. However, the principle is complex and multidimensional with many different interpretations in the evaluation of dissimilar values. It is therefore challenging to deduce a general protection from the principle as States have divergent procedures when applying it to their warfare. Furthermore, it can be argued that such a proportionality assessment has already been made by establishing “severe losses” and, subsequently, the military support’s significance, leading to the special protection’s cessation. Considering the lack of guidance on the area of proportionality, the special protection ceasing can be used as an indicator, or possible justification by States, that the attack is proportional. It is unclear if the special protection was intended to be a guideline when it comes to assessing proportionality, but the possibility of it being used as such cannot be ruled out.

## **3.2 Conclusion**

This investigation highlights that there are many hurdles to overcome for the protections to come into effect. The general protection stipulated in Article 52 is regularly rejected due to States defining nuclear power plants as military objectives. Furthermore, the States’ opportunities for discretion when interpreting the complex Article 56, and the missing guidance on interpretation, leaves the special protection ambiguous and puzzling for States applying it and not least for the civilians supposedly protected by it. This, in combination

with the proportionality principle's uncertainty, ultimately leaves the protections' efficacy dependent on States' willingness to interpret the provisions in favor of the civilian interest as opposed to the military advantage. The civilian protection's efficacy is, therefore, questionable. However, the creation and ratification by most States of the special protection indicates an eagerness to protect civilians from attacks on particularly nuclear power plants to some extent. Although, the creation and ratification can also be a result of symbolic policy-making in order to appease the civilian population propagating for statutory protection. This means that some States may never have intended to create a strong protection, and therefore created an intentionally vague regulation which leaves room for discretion. Such intentions would be reasonable from a military perspective, but would be to the civilian protection's detriment. The theory of intended vagueness during the provisions' creation is a cynical one. However, a cynical outlook might be necessary considering the provisions' efficacy in protecting civilians is ultimately reliant on States' willingness to apply them.

In any case, the regulations cannot be deemed generally efficient since they are unpredictable in what civilians will gain from them, as it depends on the State's interpretation of the regulations and their prioritization of the civilian interest. In order for the provisions to become efficient and fulfill their purpose of civilian protection, a reconstruction of them, in particular Article 56, is necessary in order to decrease the room for divergent interpretations and obstruct, if not prohibit entirely, the cessation of the special protection. However, multiple States have shown a hesitancy when faced with proposals to fortify or expand the protection, indicating a clear unwillingness to prioritize civilians. Therefore, a strengthening of the civilian protection against attacks on nuclear power plants in the near future is seemingly unlikely.

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