

Machines Making Decisions

The Applicability of State Responsibility Doctrine in the Case of Autonomous Systems

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Tiivistelmä - Referat – Abstract: <p>The present thesis explores questions related to the state responsibility for autonomous systems. The aim of this thesis is to conceptualise and elaborate on the main state responsibility issues related to the autonomous systems. The analysis consists making a definition of autonomous systems, descriptive examination of the state responsibility doctrine in the present context and an attempt to concretise the phenomenon in the scenario analysis.</p> <p>For the purpose of the thesis, autonomous systems represent technical systems that have somewhat extensive independent decision-making capabilities. There are different categories of these systems and so called off-the-loop systems are the purest example of them. In addition to independence in decision-making processes, the capability to learn and to adapt in some extent in unpredictable circumstances is also typical for autonomous systems. All these features are assumed to be constructed by humans and thus at the meta level they cannot be fully separated from human influence. It is also relevant to understand that autonomous systems contain a group of technological apparatuses which through inter-communication form a coherent system. The defining and important matter from the legal perspective is the nexus between these systems that are gaining autonomy and the responsibility for those actions.</p> <p>It is the view taken in the thesis that contemporary state responsibility system is best described in the International Law Commission's draft articles on the Responsibility of States for Internationally Wrongful Acts. Following this premise, the research is concentrated on the topics arising from these articles. The main areas of the analysis are general applicability, attribution, state agent, circumstances precluding wrongfulness and ultra vires. Moreover, the framework included rundown of the due diligence and liability aspects of autonomous systems.</p> <p>Pursuant the thesis, it can be concluded that state responsibility includes an international wrongful act and attribution of that act to a state. In the autonomous systems context there is a huge number of primary norms and any breach or omission will lead to an international wrongful act. Attribution to a state is always based on a human or a group of humans. The autonomous systems cannot create the legal link of attribution as such. The circumstances to preclude wrongfulness can be applied to the autonomous systems as well. Additionally, actions committed by autonomous systems that include components from several states can lead to shared responsibility. It is also by definition that autonomous systems cannot act ultra vires in legal sense. Furthermore, in cases when the action of a state is not against an international norm but still causes damage, the liability regime might be applicable – also in the context of autonomous systems.</p> <p>The real life analysis of autonomous systems is always context specific and the chapter on scenario analysis will provide some examples of the state responsibility questions of the different stages (namely manufacturing, testing and using) of autonomous systems. The scenario analysis is an attempt to concretize an otherwise rather problematic phenomenon. To summarize, the present thesis gives an overview of the relevant state responsibility questions of autonomous systems.</p>			
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1 Introduction

*"Any sufficiently advanced technology is indistinguishable from magic."*¹

The present thesis will explore a topic that might, indeed, sound like magic for the reason Arthur C. Clarke suggested in the quotation above. Regardless of the possible first impression, the subject is, as shall be shown in the thesis, actually really timely. Autonomous technology forms a set of technology that is pushing itself in many aspects of social conduct. Technological innovations have shaped international relations, and thus international law, throughout centuries. The improvements in shipping contributed to the work of Hugo Grotius²; the horrors at the battle of Solferino and contributions the battle made to humanitarian law³ were partly due to new arms technology; and the new technologies introduced in world wars forced humankind to seek new ways of governing international relations through United Nations⁴. There are countless examples of such technological development that has led to new social behaviour and change of legal doctrines. Truly, the development in technology has been answered with new rules, interpretations of law and ways to govern the international social sphere of nations.

The future will ultimately show the degree of autonomy given to technologies. Yet, it is already very timely to start to do legal, ethical and political analysis on the topic. It is certain that the need for such analysis grows greater as the development of technology changes the

¹ Arthur C. Clarke, *Profiles of the future: an inquiry into the limits of the possible* (Revised Ed., Harper & Row, 1973) at 21.

² Hugo Grotius, *Mare Liberum*, (1609) in Robert Feenstra (Ed. and Annotate) *Hugo Grotius Mare Liberum 1609-2009*, with general Introduction by Jeroen Vervliet (Brill Academic Publishers: Leiden 2009). See also e.g: Michael P. Scharf, *Customary International Law in Times of Fundamental Change: Recognizing Grotian Moments* (Cambridge University Press: Cambridge, 2013) at 13-27.

³ International Committee of the Red Cross (hereinafter ICRC), '150 years of humanitarian action: The Battle of Solferino', 09.07.2014, <https://www.icrc.org/eng/resources/documents/audiovisuals/video/2014/150-years-solferino-bugnion.htm>, Last checked 15.12.2014.

⁴ Charter of United Nations (hereinafter UNC), 26th June 1945 San Francisco, in force 24th October 1945; and Bruno Simma (Ed.) Hermann Mosler, Albrecht Randelzhofer, Christian Tomuschat and Rüdiger Wolfrum (collaboration) Helmut Brokelmann and Christian Rohde (Ass. Eds.) *The Charter of the United Nations: A Commentary* (Oxford University Press: Oxford, 1994).

life of every one of us. The applications of these types of technologies are close to limitless, and thus the change in social life will definitely be grand. In the present thesis the focus will solely be on international law. Further, the topic will be narrowed to the question of state responsibility for autonomous systems (also hereinafter AxS⁵) and thus this study is going to contribute to a rather narrow, yet important, aspect of the legal discourse of this new and interesting phenomenon.

1.1 Problem statement and framing of the topic

In the present thesis the aim is to explore the doctrine of state responsibility in the context of autonomous systems. In this framework, there are two main purposes of the thesis. Firstly, this is an academic Master's thesis and as such the aim is to produce basic legal research on the topic. The objective is to contribute to the wider legal discourse of responsibility in the particular context of autonomous systems. The analysis will show the legal premise for the upcoming state usage of these systems. Hence, on the academic meta-level the purpose will be to examine the degree of 'Grotian moment'⁶ that is inflected by AxS in the international relations.

Secondly, the present thesis has been contracted by the Finnish Defence Forces to contribute their research on the legal aspects of autonomous systems. Pursuant the wishes of the customer, the closer and more detailed analysis of the topic will concentrate on a fairly limited set of issues. Consequently, these two purposes have both contributed to the actual problem statement of the thesis.

The actual research will be done in the following way. Two main research questions are:

1. What are the main legal issues when applying the state responsibility in the context of autonomous systems?
2. What special questions arise from the framework of state responsibility regarding manufacturing, testing and using autonomous systems?

⁵ AxS meaning: A=autonomous, x= all domains (water, land, air and cyber), S=systems.

⁶ Michael P. Scharf, *Customary International Law in Times of Fundamental Change: Recognizing Grotian Moments*, *supra* note 2.

Given the limited possibility to go through every imaginable aspect of responsibility, some explicit framings have to be made early on. Firstly, the focus of the thesis will be on the state responsibility doctrine. This excludes some other notions of responsibility such as (international) criminal responsibility and responsibility of international organisations⁷. Reasoning behind this decision was to limit the horizontal spreading of the topic. In fact, both criminal responsibility and responsibility of international organisations remain crucially important for the autonomous systems analysis but that particular research needs to be done in separate occasion. Second framing is related to the scope of state responsibility. State responsibility will be analysed mainly in the context of state responsibility doctrine of the International Law Commission (hereinafter ILC)⁸. The major limiting notion within this theory is internationally wrongful acts⁹. However, some attention will be given to the notion of liability which is based on the notion of non-prohibited acts in international law¹⁰. Both of these aspects, still in the context of states and not e.g. international organisations, are included in the present thesis to show the different responsibilities that state might be invoked either in the context of wrongful acts or damage¹¹. This type of analysis will show, rather clearly, the limits of two different doctrines and applicability of them in the context of autonomous systems. The third major framing is to exclude jurisdiction issues and possible convictions based on international state responsibility. The decision not to include these issues is due to the willingness to concentrate on the questions of responsibility. Jurisdiction issues would open the topic too much. The framing is definitely not to downplay the importance of jurisdictional analysis. The last explicit framing in the present thesis is to limit the analysis on non-compensation or non-reparation part of state responsibility and liability doctrines. Arguably this framing will limit the analysis to aim and triggering the factors of

⁷ See e.g. Dermot Groome, 'Evidence in cases of mass criminality', in Bantekas, Ilias, and Emmanouela Mylonaki (Eds.) *Criminological Approaches to International Criminal Law* (Cambridge University Press: Cambridge, 2014) 117-158. Jan Klabbers, *An Introduction to International Institutional Law* (2nd edition, Cambridge University Press: Cambridge, 2009).

⁸ Draft articles on Responsibility of States for Internationally Wrongful Acts, with commentaries: 2001, (hereinafter ARSIWA) (ILC Yearbook 2001, vol. II[2]).

⁹ See chapter 2.2.2.

¹⁰ See chapters 2.3.7.

¹¹ See e.g. James Crawford, *State Responsibility: The General Part* (Cambridge University Press: Cambridge 2013) at 49-51.

responsibility and liability. Indeed, by framing compensations outside of the thesis, it is possible to concentrate on the allocation of a wrongful act, attribution, definition of state agent, circumstances precluding wrongfulness, ultra vires action, joint-actions of state, acts not prohibited by international law and (even) the role of due diligence more closely than it would have been possible otherwise. The analysis of the compensations remains crucial for the overall notions of responsibility and especially liability¹². Therefore more research needs to be done on that topic as well. It is the purpose of the present study to use framing described above to truly achieve the answers to the research questions.

The main research questions will be answered throughout the thesis but more precisely the structure of the thesis will be following. Firstly, in the introduction chapter the outline and premise of the thesis will be introduced. This includes inter alia explaining the significance of the topic. In chapter 2, the factual background and legal framework of the thesis are introduced. Firstly, the chapter begins with non-legal analysis where the focus is in the definition of autonomous systems. Then is the legal framing of the thesis. In this analysis the concept of responsibility is opened from sources to application of the doctrine of state responsibility, and partly liability, in the context of autonomous systems. Indeed, the chapter provides the detailed analysis of the main legal concepts. In chapter 3 manufacturing, testing and using issues of the autonomous systems will be analysed through scenario analysis. These scenarios are made to represent case study that does not exist yet. The aim is to introduce two examples of applying the state responsibility theory in the present and rather complex context of autonomous systems.

1.2 Significance of the subject

The notion of responsibility is arguably at the heart of any legal order¹³. Indeed, it can be argued to embody the meaning of the rule of law. Simultaneously it provides tools for the

¹² James Crawford, *State Responsibility*, *supra* note 11, at 480-485.

¹³ See e.g. Gen. commentary, ARSIWA, *supra* note 8; Alain Pellet, 'The Definition of Responsibility in International Law', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 3-16 at 3-5; Malcom N. Shaw, *International Law* (6th edn, Cambridge University Press: Cambridge, 2008), at 778; Ian Brownlie, *System of the Law of Nations: State Responsibility, Part I* (Clarendon Press: Oxford, 1983) at 1-6; Martin Dixon, *Textbook on International Law* (6th edn, Oxford University Press, 2007) at 242-244; Attila Tanzi, 'Is Damage a Distinct

conceptualisation of legal relationships between subjects of law after a breach of a norm.¹⁴ While responsibility as such can be seen as empty signifier in that it carries no detailed explanation of the consequences or implicit rules of attribution in itself¹⁵, the role of the notion as critical part of legal order is absolutely clear¹⁶.

The responsibility of states has long been in the centre of discourse for international responsibility and thus international law itself¹⁷. The importance is mainly due to (sovereign) state-centrism in international relations and also international law¹⁸. So called Lotus Rule explains this state centrism in international law in the following way: '*Restrictions upon the independence of States cannot therefore be presumed*'¹⁹. Following the formulation, state

Condition for the Existence of an Internationally Wrongful Act', in Marina Spinedi and Bruno Simma (Eds.) *United Nations Codification of State Responsibility* (Oceana Publications, Inc.: New York, 1987) 2-33 at 2; Katja Creutz, 'Law versus Codes of Conduct: Between Convergence and Conflict', in Jan Klabbers and Tuomo Piirainen (Eds.) *Normative Pluralism and International Law* (Cambridge University Press: Cambridge, 2013) 166-200 at 181-197; and Paul McDonough, Magdalena Kmak and Joanne van Selm, 'Sharing Responsibility for Refugee Protection in Europe: Dublin Reconsidered' (European Council on Refugees and Exiles, 2008) 1-35.

¹⁴ Alain Pellet, 'The Definition of Responsibility in International Law', *supra* note 13, at 6-11; and Muthucumaraswamy Sornarajah, *The International Law on Foreign Investment Law* (2nd Edition, Cambridge University Press: Cambridge, 2004) at 8.

¹⁵ More on the empty signifiers from e.g. Ernesto Laclau, *Emancipation(s)* (Verso: London, 1996) at 36-40.

¹⁶ See e.g. *Phosphates in Morocco (Italy v. France)*, Judgment, PCIJ Series A/B, No. 74 (1938) 11, at para. 28; *S.S. "Wimbledon" (United Kingdom, France, Italy & Japan v. Germany)*, Judgment, PCIJ Series A, No. 1 (1923) 16, at para. 50; *Factory at Chorzów, Jurisdiction (Germany v. Poland)* (hereinafter *Factory at Chorzów case*), Judgment No. 8, PCIJ Series A, No. 9 (1927) 1, at para. 106; *Corfu Channel, Merits (United Kingdom of Great Britain and Northern Ireland v. Albania)*, Judgment, ICJ Reports (1949) 4, at 23; *Military and Paramilitary Activities in and against Nicaragua* (hereinafter *Military and Paramilitary Activities*) (*Nicaragua v. United States of America*), Merits, Judgment, ICJ Reports (1986) 14, at 142 and 146; *Gabčíkovo-Nagymaros Project (Hungary v. Slovakia)*, ICJ Reports (1997) 7, at 38; *Interpretation of Peace Treaties with Bulgaria, Hungary and Romania, Second Phase*, Advisory Opinion, ICJ Reports (1950), p. 221 at 228; *Claim of Finnish Shipowners against Great Britain in Respect of the Use of Certain Finnish Vessels during the War* (hereinafter *Finnish Ships Arbitration*) (*Finland v. Great Britain*), 3 RIAA (1934), 1479-1550 at 1984-1985, 1947 and 1501-1502; and *United States Diplomatic and Consular Staff in Tehran (United States of America v. Iran)*, Judgment, ICJ Reports (1980) 3, at 31.

¹⁷ See e.g. James Crawford, Alain Pellet and Simon Olleson, 'Preface', in James Crawford, Alain Pellet and Simon Olleson (Eds.) *The Law of International Responsibility* (Oxford University Press: Oxford 2010) V-VII at V; Martti Koskeniemi, 'Solidarity Measures: State Responsibility as a New International Order?' 72 (1) *British Yearbook of International Law* (2001) 337-356 at 337-339; *Reparation for Injuries Suffered in the Service of the United Nations* (hereinafter *Reparation for Injuries Case*), Advisory Opinion, ICJ Reports (1949), at 15 para. 185.

¹⁸ Susan Marks, 'State-Centrism, International Law, and the Anxieties of Influence', 19:2 *Leiden Journal of International Law* (2006) 339-347; Malcom N. Shaw, *International Law*, *supra* note 13, at 1-13; See also: Martti Koskeniemi, *From Apology to Utopia: The Structure of International Legal Argument – Reissue with New Epilogue* (Cambridge University Press: Cambridge, 2005), at 224-303 especially 240-245.

¹⁹ *The Case of the S.S. "LOTUS" (France v. Turkey)* (hereinafter *Lotus case*), Judgment, PCIJ, Series A, No. 70 (1927) 5 at 18.

responsibility has to be considered as specific form of responsibility regardless that the notion of responsibility is also legally relevant in the contexts of e.g. international criminal law²⁰ and international institutional law²¹. Currently state responsibility is best formulized in the ILC articles on Responsibility of States for Internationally Wrongful Acts and its commentaries (hereinafter ARSIWA)²². The significance and scope of these articles are profoundly shown in the present thesis. Consequently, these articles will be at the centre of this thesis as well. Taking into account the role of the ILC as codifier (and possible creator) of international customary law, the examination of the usability of state responsibility doctrine is important in itself²³. Further, given the complexity and uncertainty concerning non-legal section of the present thesis, analysis of state responsibility gains even more overall significance.

Autonomous system ought to be understood as a new step in technological development. Actually, AxS is a system of machines (or algorithms) performing tasks with less amount (or potentially totally without) of human involvement in somewhat unpredictable circumstances²⁴. These technologies have a huge potential to change many areas of human life – from individual civilian application to systemic military concepts. The development process has both hardware and software components. These vary quantitatively and qualitatively depending on the contexts. Both components have developed into direction to allow more autonomy for machines already for many years. Still, so far the most of these systems have lacked many aspects to be called ‘autonomous’ as such – perhaps with some exceptions such as autonomous trading agents. Even the theoretical possibility to have ‘fully autonomous’ systems in the sphere of present understanding can be questioned.²⁵

²⁰ See e.g. Malcom N. Shaw, *International Law*, *supra* note 13, at 397-399; See also: Ian Brownlie, *Principles of Public International Law* (7th edition, Oxford University Press: Oxford, 2008) at 433-436.

²¹ Jan Klabbbers, *An Introduction to International Institutional Law* (2nd edition, Cambridge: Cambridge University Press, 2009) at 179-180.

²² ARSIWA, *supra* note 8.

²³ ILC, ‘Infroduction - Origin and background of the development and codification of international law’, <http://legal.un.org/ilc/ilcintro.htm>, Last checked 15.12.2014

²⁴ See chapter 2.1.

²⁵ Sharon Weinberger, ‘Next generation military robots have minds of their own’ BBC, 28th September 2012, <http://www.bbc.com/future/story/20120928-battle-bots-think-for-themselves>, Last checked 19.01.2015; Keith Wagstaff, ‘Future Tech? Autonomous Killer Robots Are Already Here’, *NBCNEWS*, 15th May 2014, <http://www.nbcnews.com/tech/security/future-tech-autonomous-killer-robots-are-already-here-n105656>, Last checked 19.01.2015. See also: Panos Toulis, Dionisis Kehagias and Pericles A. Mitkas,

The comprehensiveness of these new technologies is arguably changing the behaviour patterns in many areas of social life. The present thesis consists both an attempt to define autonomous systems and the legal state responsibility perspective. The latter is done both in general terms and through scenario analysis.²⁶ The aim is through the scenarios to illustrate the possibilities in the field of autonomous systems, the changing role of human agent and the challenge this brings to debate on state responsibility²⁷. All these aspects are under heavy debate in the international sphere and there are attempts to set boundaries for these technologies even before they have entered in generic use²⁸.

It seems at the moment that much emphasis is globally given to the development of autonomy of technology²⁹. In addition to mere technical solutions, the debate is also heating in terms of law, ethics and politics of these systems³⁰. Based both on the development of technology and recently warmed debate, it seems that there is no doubt concerning future significance of the autonomous systems. Similarly, the state responsibility doctrine seems a fruitful way to approach this phenomenon. The doctrine is at the heart of international law and therefore state responsibility issues are the questions that have to be very clear from the very start when these technologies appear on e.g. battlefields. Actually, while revealing the most important parts of state responsibility (such as breach of obligation or attribution) in the context autonomous systems, one is also be able to expose other problematic aspects of law towards AxS. For example, the state responsibility doctrine presumably helps to understand due diligence obligations of states acting in the context of autonomous systems. To summarise, based on the importance of the legal doctrine and the material substance, it

'Mertacor: A Successful Autonomous Trading Agent', http://www.people.fas.harvard.edu/~ptoulis/harvard-homepage/content/mertacor_classic.pdf, Last Checked 17.10.2014. For more see chapter 2.1.

²⁶ Annexes 1 and 2.

²⁷ Chapter 2.1.1.

²⁸ ICRC, 'Expert Meeting: Autonomous Weapon Systems Technical, Military, Legal and Humanitarian Aspects Geneva' (Switzerland 26th To 28th March, 2014) <https://www.icrc.org/en/download/file/1707/4221-002-autonomous-weapons-systems-full-report.pdf>, Last checked 15.12.2014, 2-102; Campaign to Stop Killer Robots, 'Statements', <http://www.stopkillerrobots.org/statements/>, Last checked 19.01.2015.

²⁹ MCDC, 'Legal analysis', in MCDC, *Focus Area "Role of Autonomous Systems in Gaining Operational Access" Policy Guidance Autonomy in Defence Systems* (SACT HQ, Norfolk, 2014), 14-18.

³⁰ ICRC, Expert Meeting: 'Autonomous Weapon Systems Technical, Military, Legal And Humanitarian Aspects Geneva', *supra* note 29; and Campaign to Stop Killer Robots, 'Statement', *supra* note 28.

is easy to establish that research of AxS in the context of state responsibility is very topical and there is good reason to believe that it will contribute to the future research of the topic.

1.3 Methodology

Methodologically the present thesis can be seen to consist of two parts. The first part of the thesis follows traditional legal research³¹. This methodological framework can be described as doctrinal. This type of analysis is analysis of the black letter of the law³² which tries to describe the contemporary normative framework. The reason for this approach is firstly to conceptualise the notion of state responsibility as it is presented in contemporary international law – e.g. in the ILC's articles and legal literature. Secondly, the aim is to bring legal weight and constancy to the analysis of autonomous systems.

The second part (chapter 3) of the thesis is scenario based analysis. Methodologically this part is a combination of independently structured scenarios and doctrinal applicability of relevant state responsibility, and partly liability, rules. The purpose is to demonstrate through scenarios the material issue (AxS) and the legal doctrine of state responsibility in more practical context. The scenarios are not written as narratives but rather as a set of circumstances which describe the situation. Hence, the analysis in the context of scenarios might concentrate on rather particular issues – not the whole doctrine of state responsibility. Therefore methodologically scenarios are a way to specify and reveal some chosen aspects related to the issues of state responsibility for autonomous systems.

³¹ See e.g. Maarten Bos, *A Methodology of International Law* (North Holland: Amsterdam, 1984).

³² Mike McConville and Wing Hong Chui, 'Introduction and Overview', in Mike McConville and Wing Hong Chui (Eds.) *Research Methods of the Law* (Edinburgh University Press Ltd, 2007) at 3-4.

2 Factual Background and General Analysis

In this chapter the high level legal and technical-operational frameworks of the thesis are presented and analysed. Firstly, in chapter 2.1 the technical and operational framework of the thesis is described. The objective in this chapter is to provide enough factual understanding of AxS for the purposes of legal analysis. Secondly, in chapter 2.2 the concept of responsibility is introduced from the historical and present day perspectives. The aim is both to explain the background of the present doctrine of responsibility and to put it in the contemporary context of state responsibility. Thirdly, in the chapter 2.3, more detail aspects of state responsibility doctrine are introduced. This part of the chapter 2 consists of detailed analysis of the state responsibility doctrine, and for the relevant part liability as well.

2.1 Introduction to the technical and operational framework

This chapter provides basic information concerning autonomous systems including general aspects of the operational use – given that it is relevant for the purpose of this thesis. Obviously, it is not reasonable or even possible to cover the whole phenomenon of the autonomy of technology³³. Hence, closer framing of the phenomenon is done in sub-chapters 2.1.1 and 2.1.2 and then applied in the context of state responsibility later in chapter 2. These definitions explained in the following sub-chapter also form background for the scenario analysis in chapter 3 as well.

2.1.1 The background and development of autonomous systems technology

There is a good reason to believe that autonomous systems, as they are somewhat peculiarly called, will constitute huge change in social behaviour. Development of these systems, and getting ready for the world filled with them, is in the agenda of many international agents – including states.³⁴ Indeed, for example in the publications of the National Defence University

³³ Kenneth Anderson and Matthew Waxman, 'Law and Ethics for Autonomous Weapon Systems: Why a Ban Won't Work and How the Laws of War Can' *11 American University Washington College of Law Research Paper, Columbia Public Law Research Paper* (2013) 1-33.

³⁴ Pääesikunnan Sotatalousosasto, *Teknologinen kehitys: Sotatekninen arvio ja ennuste 2020: STAE 2020, osa 1* (Edita Prima Oy: Helsinki, 2004) at 557-558; See also e.g. John Markoff, 'Fearing Bombs That Can Pick Whom to Kill', *New York Times*, 11th November 2014; and Yong Zhang, Brandon K. Chen, Student Member, Xinyu Liu, and Yu Sun, 'Autonomous Robotic Pick-and-Place of Microobjects' *26:1 Ieee Transactions On*

of Finland authors have taken autonomy into account for years. These analyses have indicated huge potential in the development of autonomy.³⁵

The starting point for the analysis is the fact that the term autonomous system might create wrong implications of the phenomenon. In the present thesis autonomous systems represent a sort of action engaged by a system of machines that could be described ‘autonomous-like behaviour’³⁶. Truly, from philosophical perspective autonomous system, if constructed by a human, cannot really be autonomous. The reason is that if a human has programmed algorithm to perform tasks, it has been the human who has decided the structure of the code. Additionally, by setting parameters for given operation, human is influencing the action of ‘autonomous system’. Hence, the autonomy in its purest sense is always relative – at least in the foreseeable future.³⁷ Despite the mentioned logical problem with the concept, it has gained ground in the public debate³⁸. Thusly, for the purpose of the present research the autonomous systems is the term used in it, yet, it does refer to autonomous-like features.

Keeping in mind the limits of the concept, it is easy to understand that discussions concerning autonomy, as technical solutions, has risen from the framework of automatisisation and automatic systems. The main issue is that both types of technologies are invented to perform certain tasks. The difference between the tasks that on one hand autonomous systems and on the other automatic systems are able to perform is in increasing complexity in an

Robotics (2010) <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5342467>, Last checked 08.01.2015, 200-207.

³⁵ Pääesikunnan Sotatalousosasto, *Sotatekninen arvio ja ennuste 2020 [...] osa 1*, supra note 34, at 287-289, 355-431 and 557-558; Pääesikunnan Sotatalousosasto, *Teknologinen kehitys: Sotatekninen arvio ja ennuste 2020: STAE 2020, osa 2* (Edita Prima Oy: Helsinki, 2004) at 16-19, 45-46, 400-401; Mikko Kari, Arto Hakala, Elisa Pääkkönen ja Markku Pitkänen (Eds.), *Sotatekninen arvio ja ennuste 2025: STAE 2025: osa 1: Teknologinen kehitys* (Puolustusvoimien Tekninen Tutkimuslaitos: Ylöjärvi, 2008) at 256-259, 330-336 and 366-406; and Mikko Kari, Arto Hakala, Elisa Pääkkönen ja Markku Pitkänen (Eds.), *Sotatekninen arvio ja ennuste 2025: STAE 2025: osa 2: Puolustusjärjestelmien kehitys*, (Puolustusvoimien Tekninen Tutkimuslaitos: Ylöjärvi, 2008) at 13-15, 23-24 and 32-33.

³⁶ MCDC, ‘Ethical Issues’, in MCDC, Focus Area “Role of Autonomous Systems in Gaining Operational Access” Policy Guidance Autonomy in Defence Systems (SACT HQ, Norfolk, 2014), 18-23 at 19.

³⁷ MCDC, ‘Ethical Issues’, supra note 36, 18-23.

³⁸ Pericle Salvini, Giancarlo Teti, Enza Spadoni, Emiliano Frediani, Silvio Boccalatte, Luca Nocco, Barbara Mazzolai, Cecilia Laschi, Giovanni Comandé, Emanuele Rossi, Paolo Carrozza and Paolo Dario, ‘An Investigation on Legal Regulations for Robot Deployment in Urban Areas: A Focus on Italian Law’ 24 *Advanced Robotics* (2010) 1901–1917; and Aaron Mehta, ‘U.S. DoD’s Autonomous Weapons Directive Keeps Man in the Loop’, *Defence News*, 27th November, 2012. <http://www.defensenews.com/article/20121127/DEFREG02/311270005/U-S-DoD-8217-s->, Last checked 19.01.2015.

uncertain environment. The tasks for autonomous systems are such that they need more complexity than pre-programmed action.

The motivation for changing the tasks from human to automatic, or even to autonomous, machine or system vary greatly depending on particular context.³⁹ Still some generalisation can be made. Obviously, the major issues with automatisisation (and autonomisation) of tasks is creation of efficiency – regardless of the task. Efficiency in this sense can mean everything from better monetary value to saving human lives.

It is easy to understand that technological solutions themselves might vary between for example under water systems and aerial based systems⁴⁰. The operational, technological and, indeed, ethical, legal and social connotations alter through change of domains. Hence, before the technology is acting autonomously, designer has to concentrate on the specifics of the platform – from more than one perspective. The question of platforms includes both software and hardware elements⁴¹. Actually, the autonomous system platforms are now facing many similar problems as for example computers and mobile phones have faced. This is especially true in the context of the operating system and hardware providers. Therefore the basis of technical and operational limits of a given autonomous system is already set when choosing operating domain and platform. New innovations are solving these problems and are providing ground-breaking solutions. The limits of technical capabilities, both in software and hardware sense, are moving towards rather autonomously capable systems – including weapon systems⁴².

³⁹ Noel Sharkey, 'The Automation and Proliferation of Military Drones and the Protection of Civilians' 3:2 *Law, Innovation and Technology* (2011) 229-240; and Yueh-HsuanWeng, 'Beyond Robot Ethics: On a Legislative Consortium for Social Robotics' 24 *Advanced Robotics* (2010) http://works.bepress.com/cgi/viewcontent.cgi?article=1016&context=weng_yueh_hsuan, Last checked 08.01.2014, 1919–1926.

⁴⁰ Pääesikunnan Sotatalousosasto, *Sotatekninen arvio ja ennuste 2020 [...] osa 1, supra* note 34, at 355-431.

⁴¹ See e.g. DARPA, 'Autonomous Robotic Manipulation (ARM), Defense Sciences Office', http://www.darpa.mil/Our_Work/DSO/Programs/Autonomous_Robotic_Manipulation_%28ARM%29.aspx, Last checked 19.01.2015.

⁴² DARPA, Autonomous Robotic Manipulation (ARM), *supra* note 41; See also e.g. Pääesikunnan Sotatalousosasto, *Teknologinen kehitys: Sotatekninen arvio ja ennuste 2020 [...] osa 2, supra* note 35, at 404-408; Kate Ramien, 'Drones and robots look to the future' *Namoi Valley Independent*, 9th January 2015, <http://www.nvi.com.au/story/2439866/drones-and-robots-look-to-the-future/?cs=373>, Last checked 19.01.2015; Adam Clark Estes, 'IBM's New Brain-Like Chip Squeezes One Million Neurons On to a Stamp', *GIZMODO*, 8th July, 2014, <http://gizmodo.com/ibms-new-brain-like-chip-squeezes-one-million-neurons-o>

In conclusion, it needs to be underlined that fully and truly autonomous systems do not exist, nor are probable to exist in the foreseeable future. Human influence presumably remains as a feature of the systems in the foreseeable future. Indeed, humans have their roles for example in a making the decisions to build or programme a system or in feeding the specific parameters into AxS. This is true regardless whether these people make mistakes or cause unintended consequences through their actions. Therefore, it is important to keep in mind that the term autonomous systems refer always to systems with autonomous features.

2.1.2 Different degrees of autonomy in technical systems

For the purpose of the present thesis, the level of autonomy is especially important part of discussion and there are multiple ways to conceptualise the question of autonomy⁴³. Thusly, the approach chosen here is made for the purpose of the present thesis and it is an attempt to sufficiently encompass the major elements of contemporary discussions. Simultaneously this issue represents much of the criticism that autonomous systems are facing – especially in weapon context.⁴⁴

The conceptualisation of autonomy could be done by categorizing the degrees of autonomy. One way to do that is to compare the operational possibilities to the role of human. Indeed, the categorisation attempts to put a difference between the degrees of control of humans – thusly defining autonomy of systems in question. The nature of connection between the operator and system is crucial. The Royal Academy of Engineering has conceptualised the link in a following way:

- controlled systems: where humans have full or partial control, such as an ordinary car

1617642003, Last checked 19.01.2015; Jing Guo, Gangfeng Yan, Zhiyun Lin, 'Local control strategy for moving-target-enclosing under dynamically changing network topology' 59 *Systems & Control Letters* (2010) 654-661.

⁴³ The Royal Academy of Engineering (hereinafter RAE), 'Autonomous Systems: Social, Legal and Ethical Issues' (The Royal Academy of Engineering 3 Carlton House Terrace: London, 2009) <http://www.raeng.org.uk/publications/reports/autonomous-systems-report>, Last checked 19.01.2015, 1-15 at 2.

⁴⁴ RAE, *Autonomous Systems: Social, Legal and Ethical Issues*, *supra* note 43; Noel Sharkey, 'The inevitability of autonomous robot warfare' 94:886 *International Review of the Red Cross* (2012), 787-799; ICRC, 'Report of the ICRC Expert Meeting on [...] - MEETING HIGHLIGHTS', *infra* note 56.

- supervised systems: which do what an operator has instructed, such as a programmed lathe or other industrial machinery
- automatic systems: that carry out fixed functions without the intervention of an operator, such as an elevator
- autonomous systems that are adaptive, learn and can make 'decisions'.⁴⁵

The division into four levels describes the main elements of the nexus between operator and system quite well. Especially the definitions of controlled and autonomous systems are the clearest categories. Indeed, these two are quite to the purpose of the present thesis as well. At this point it is not necessary to analyse software or hardware parts of such systems in a more detail level.⁴⁶

The difference between supervised and automatic systems seems to be unnecessary for the purpose of this thesis. Especially problematic is the scope of definition of automatic system. For the purpose of the current analysis, automatic systems are part of other mentioned systems. Even the controlled systems often include automatic part(s) within them⁴⁷. On the other hand capability to act without supervision is a feature in autonomous systems⁴⁸. That is why automatic, as defined above, is either a feature in a system or a particular feature in an autonomous system – mainly the capability to act alone⁴⁹.

For these reasons the analytical framework for different degrees of autonomy is divided in three. These are called: in-the-loop; on-the-loop; and of-the-loop⁵⁰. All of them refer to the role of an operator of the system in question. These terms have been used by some

⁴⁵ RAE, 'Autonomous Systems: Social, Legal and Ethical Issues', *supra* note 43, at 2.

⁴⁶ Recall chapter 2.1.1.

⁴⁷ RAE, 'Autonomous Systems: Social, Legal and Ethical Issues', *supra* note 43, at 2 and 6-8.

⁴⁸ RAE, 'Autonomous Systems: Social, Legal and Ethical Issues', *supra* note 43, at 6-10.

⁴⁹ RAE, 'Autonomous Systems: Social, Legal and Ethical Issues', *supra* note 43, at 2-10.

⁵⁰ Human Rights Watch and International Human Rights Clinic: Human Rights Program at Harvard Law School, 'Review Of The 2012 Us Policy On Autonomy In Weapons Systems' (2013) http://www.hrw.org/sites/default/files/related_material/4.2013%20Review%20of%20US%20Policy%20on%20Killer%20Robots.pdf, Last checked 8.1.2014, 1-9 at 2-4; UNDIR, 'Framing Discussions on the Weaponization of Increasingly Autonomous Technologies' (2014) <http://www.unidir.org/files/publications/pdfs/framing-discussions-on-the-weaponization-of-increasingly-autonomous-technologies-en-606.pdf>, Last checked 19.01.2015, 1-11 at 8-11.

scholars⁵¹. In-the-loop systems are such where an operator is almost constantly in control of the system. In these situations the operator is actively making the decisions and controlling the activities⁵². Still, even in in-the-loop systems there might be some parts that are automatized, such as breaks or defensive mechanisms⁵³. Many times the automatisation is added to these in-the-loop systems because of the tempo that the activity of system requires⁵⁴. Still, in in-the-loop systems, the overall control and decision-making capabilities are in the hands of the operator – such as drones for example⁵⁵.

On-the-loop systems are supervised but still rather automatized systems. It is evident that an operator has a different role compared with the in-the-loop systems. The operator's active part is when she or he feeds the mission parameters or operation requirements into the system. It is then the system itself that adapts to these commands – following its algorithm.⁵⁶ The mission requirements are in many cases numerical and explicit – not descriptive. Obviously this depends on the algorithm and how it is coded. Additionally, operator, as a supervisor, has the capability to take control of the system and change it to an in-the-loop system⁵⁷.

Off-the-loop systems are remarkably different. Off-the-loop systems act autonomously in non-predictable circumstances including certain learning and decision-making capabilities⁵⁸. The role of the operator in an off-the-loop system is to observe also mission but especially the results. Additionally, the follow-up action is then partly initiated by the operator or the

⁵¹ Noel Sharkey, 'Saying 'No!' to Lethal Autonomous Targeting' 9:4 *Journal of Military Ethics* (2010) 369-383 at 370-371; and see also: Wenchao Li, Dorsa Sadigh, S. Shankar Sastry and Sanjit A. Seshia, 'Synthesis for Human-in-the-Loop Control Systems' Tech. Rep. No. UCB/EECS-2013-134 (17th July 2013) <http://www.eecs.berkeley.edu/Pubs/TechRpts/2013/EECS-2013-134.html>, Last checked 19.01.2015, 3-14.

⁵² Human Rights Watch and International Human Rights Clinic: Human Rights Program at Harvard Law School' Review Of The 2012', *supra* note 50, at 2-4.

⁵³ RAE, Autonomous Systems: Social, Legal and Ethical Issues, *supra* note 43, at 2.

⁵⁴ Kenneth Anderson, Daniel Reisner and Matthew Waxman, 'Adapting the Law of Armed Conflict to Autonomous Weapon Systems' 90 *Stockton Center for the Study of International Law [INT'L L. STUD]* (2014) 386-411 at 388.

⁵⁵ Jyri Kosola, 'Disruptiiviset teknologiat puolustuskontekstissa' (Pääsikunta - materiaali osasto: Helsinki, 2013), 1-26 at 6-11.

⁵⁶ ICRC, 'Report of the ICRC Expert Meeting on "Autonomous weapon systems: technical, military, legal and humanitarian aspects" - MEETING HIGHLIGHTS', (Geneva, 26th-28th March 2014) <https://www.icrc.org/eng/assets/files/2014/expert-meeting-autonomous-weapons-icrc-report-2014-05-09.pdf>, Last checked 19.01.2015, 1-16 at 6.

⁵⁷ ICRC, 'Report of the ICRC Expert Meeting on [...] - MEETING HIGHLIGHTS', *supra* note 56, at 11.

⁵⁸ See e.g. RAE, 'Autonomous Systems: Social, Legal and Ethical Issues', *supra* note 43, at 2; and

operator head-quarter. In off-the-loop systems, the operator could still have capability to end the mission or to communicate with the off-the-loop system – at least when it is physically possible.⁵⁹ It is therefore characteristic of a pure off-the-loop system that it can go through its mission without active control or even supervision.

It is important to understand that the purest form of off-the-loop systems are not yet in use – as far as it is possible to know. Some systems might be close to be off-the-loop but in the operational sense they are rather confined and also their off-the-loop capabilities are limited⁶⁰. It is also unlikely that pure off-the-loop systems would be developed in the near future. Especially systems, which do not have a ‘kill-switch’ to end the operation, are unlikely⁶¹. Some operational capabilities, such as the capability to make decision to fire, are also features that are at least debated at the moment⁶². It is clear that this type of decisions, like all the actions done by AxS, are subjected to international and national law to its full extend. So, even this type of decisions should have to follow humanitarian law – when applicable of course. The learning feature, in its full sense of the word, is rather problematic as well. Yet, the limits of artificial intelligence cannot be defined or predicted precisely. Cognitive processes are likely to be part of off-the-loop systems eventually⁶³. To summarise off-the-loop systems, in their purest meaning, they are unlikely but to some extend foreseeable. Also these systems are the clearest examples of autonomous systems.

It is also very typical for all the systems above that the complexity regarding algorithms and operational capabilities is a precondition. Even in-the-loop systems are developed towards such direction that the code embedded within them is rather intricate. This is many times accompanied with the encryption protection and legal obligations that the code cannot be unpacked. Indeed, the manufacturer might easily want to protect the code by asserting limits for the decryption of the algorithm. These aspects are very problematic from the end user perspective since it is very hard to be convinced about the limits of operational capabilities.

ICRC, ‘Report of the ICRC Expert Meeting on [...] - MEETING HIGHLIGHTS’, *supra* note 56, at 9-12.

⁶⁰ Keith Wagstaff, ‘Future Tech? Autonomous Killer Robots Are Already’, *supra* note 25.

⁶¹ See technology programs e.g. United Kingdom Defence Science and Technology Laboratory, ‘£9 million available for future of Maritime Autonomous Systems’, <https://www.gov.uk/government/news/9-million-available-for-future-of-maritime-autonomous-systems>, Last checked 19.01.2015.

⁶² MCDC, ‘Legal analysis’, *supra* note 29, 14-18; and ICRC, ‘Report of the ICRC Expert Meeting on [...] - MEETING HIGHLIGHTS’, *supra* note 56, at 9-12.

⁶³ Jyri Kosola, ‘Disruptiiviset teknologiat puolustuskontekstissa’, *supra* note 55, at 20-21.

Such uncertainty is very problematic also from the legal perspective – including responsibility perspective. Actually, it is almost impossible to get confirmation of the operational capabilities based either on cytological or contractual reasons. Hence, one of the main issues for the end user is to solve the complexity dilemma as well as possible.

Following the categorization above it might be possible to think that the degree of autonomy is easy to determine. The position in the present thesis is that the determination remains complicated. Indeed, the degree of autonomous features is rather relative. When trying to define autonomous systems the key issues to consider are system's connection towards humans and its operational capabilities. In this sense, off-the-loop system is the purest form of autonomous system. Yet, on-the-loop systems might also be so close to system that has 'autonomous capabilities'⁶⁴ that they could be described as autonomous systems as well. Indeed, the most important is to realise the potential of autonomous like features and operational changes that they bring.

2.2 Introduction to state responsibility

In this section of the thesis notion of state responsibility will be covered in a general level. Later in the thesis the concept will then be applied in the technical context of autonomous systems. Additionally, in this chapter the aim is to keep the primary focus on the rules of state responsibility, however, it is also necessary to introduce some elements from sources of international law and historical aspects of international responsibility to give more concrete and complete framework for the analysis.

2.2.1 Sources of the state responsibility

For the purpose of the present thesis it is reasonable to discuss the issue of the international law sources. The importance of the analysis is especially in the special nature of sources related to the concept of state reasonability⁶⁵. Additionally, the knowledge of the vast amount of relevant sources and their inter-relations is useful for understanding the complex regulatory framework of autonomous systems. The emphasis in the present analysis is in the

⁶⁴ See chapter 2.2.1.

⁶⁵ ARSIWA, *supra* note 8.

‘official’ sources of international law and not that much the ontological sources of law⁶⁶. By the official sources it is referred to those sources that are explicitly described in the Statute of the International Court of Justice (hereinafter ICJ)⁶⁷. The issue of sources is not, obviously, this simple but there remains much complexity that cannot be solved through the analysis of the present thesis⁶⁸. It is the argument in the present thesis that even rather simple analysis of the sources will be beneficial later when analysing the applicability and nuances of state responsibility doctrine.

There is an important dichotomy between consent and justice that needs to be addressed before dealing with the actual sources of international law. Understanding this nexus helps to understand possible new legislation that might appear in the future regarding security issues and autonomous systems. Indeed, the dichotomy is a good way to conceptualise the origin of sources of international law. For example, international treaty law seems to be the culmination of the state party acting through sovereign power and showing consent to be bound by rules⁶⁹ - but this is only one way to create new legislation in the area. Indeed, there are critical inadequacies within the theory of pure consensualism asserting itself – called also as apologism⁷⁰. For example consent cannot explain all the epistemological and ontological backgrounds of the international legal sources. At the same time relying purely on the idea of justice, and hence morality, remains insufficient for the total explanation for the origin of

⁶⁶ Malcom N. Shaw, *International Law*, *supra* note 13, at 70; Maarten Bos, *A Methodology of International Law*, *supra* note 31, at 48-49. On law as normative concept see: Jan Klabbers and Tuomo Piirainen (Eds.) *Normative Pluralism and International Law* (Cambridge University Press: Cambridge 2013).

⁶⁷ ICJ, ‘Statute of the International Court of Justice’, <http://www.icj-cij.org/documents/?p1=4&p2=2&p3=0>, Last checked 15.12.2014. See also e.g. David Kennedy, ‘The Sources of International Law’, in Martti Koskenniemi (Ed.), *International Law* (Dartmouth Publishing Company Limited: Aldershot, 1992) 294-388 at 294-302; and Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 3-4. Compare e.g. Antônio Augusto Cançado Trindade, *International Law for Humankind* (2nd revised edition, The Hague Academy of International Law, Martinus Nijhoff Publishers: Leiden, 2013) at 113-138.

⁶⁸ See e.g. Maarten Bos, *A Methodology of International Law*, *supra* note 31, at 51-56. See also: Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 309-325. See also e.g. P. E. Corbett, ‘The Consent of States and the Sources of the Law of Nations’, in Joseph Weiler and Alan T. Nissel (Eds.) *International Law: Critical Concepts in Law, Volume II, Fundamentals of International Law I* (Routledge Taylor & Francis Group: London, 2011) 5-13.

⁶⁹ See Vienna Convention on the law of treaties (with annex) (hereinafter *VCLT*). 23rd May 1969, in force 27 January 1980, 1155 UNTS 331; *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion (hereinafter *Legality of Nuclear Weapons Case separate*), Separate Opinion of Judge Guillaume (translation), ICJ Reports (1996) 287 at 291-292.

⁷⁰ Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 309-312 and 332-333.

sources as well. One of the main problems is that the notion cannot escape the utopia of natural morality⁷¹. Obviously only relying on justice would collide with the notion of sovereignty of states⁷². Hence, the position in the present thesis is that the epistemological background of the sources is based on both consent and idea of justice through custom, general principles and different interpretation – letting the topic to be open-ended⁷³. It is especially through the interpretation of the nuances of state responsibility that the notion of justice has gained importance in the area of the present thesis. It is also important to understand that because sources of law are related to both state consent and more normative idea of justice, the relevant legal sources for the discussion about autonomous systems are rising from the both legalistic and political traditions of international behaviour. As the final note, the whole issue is culminated around the fact that international system lacks a parliament initiating global laws and system of courts validating comprehensively and compulsorily the interpretation of these laws⁷⁴. It makes the dichotomy even more politically problematic.

Pursuant Article 38 of the ICJ Statute the sources are:

- “1. The Court, whose function is to decide in accordance with international law such disputes as are submitted to it, shall apply:
- a. international conventions, whether general or particular, establishing rules expressly recognized by the contesting states; b.
 - international custom, as evidence of a general practice accepted as law; c. the general principles of law recognized by civilized nations; d. subject to the provisions of Article 59, judicial decisions and the teachings of the most highly qualified publicists of the

⁷¹ Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 309-333.

⁷² Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 320.

⁷³ Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 364-365 and 385-387, see also 303-387.

⁷⁴ Malcom N. Shaw, *International Law*, *supra* note 13, at 69-71. See also e.g. Michael Akehurst, *A Modern Introduction to International Law* (George Allen and Unwin LTD: London, 1970) at 16-22; Hilary Charlesworth, ‘Law-making and sources’, in James Crawford and Martti Koskenniemi (Eds.) Surabhi Ranganathan (Ass. Ed.) *The Cambridge Companion to International Law* (Cambridge University Press: Cambridge, 2012) 187-202; and Benedict Kingsbury, ‘International courts: uneven judicialisation in global order’, in James Crawford and Martti Koskenniemi (Eds.) Surabhi Ranganathan (Ass. Ed.) *The Cambridge Companion to International Law* (Cambridge University Press: Cambridge, 2012) 203-227.

various nations, as subsidiary means for the determination of rules of law.

2. This provision shall not prejudice the power of the Court to decide a case *ex aequo et bono*, if the parties agree thereto.”⁷⁵

Article 38 provides the exhaustive list of sources applicable by the Court. In addition to concrete types of sources in Article 38(1), Article 38(2) allows the Court to settle a dispute following the rule *ex aequo et bono* (to decide on the basis of equity and justice). According to Hilary Charlesworth, by the year 2011, the provision of Article 38(2) had not been used ‘*in the International Court*’⁷⁶. Hence, this type of sources will not be further analysed. This is not to say that autonomous systems could not theoretically provoke such cases in the future. Yet, because of the lack of such cases, it seems rather unfruitful to just invent such situations. The hierarchy between the sources is, as the main rule, following: the provisions a, b and c are in sense equal and d is, as described subsidiary – for the Court to consider⁷⁷. The issue between treaty and custom needs more attention⁷⁸ and it will be dealt later. Definitions between customary law and general principles of law are famously left unclarified in the Article itself.⁷⁹ This issue will also be addressed later in this sub-chapter.

The purpose for the whole analysis of the sources is to give clarity to them in the context of state responsibility and to underline to a reader what weight ought to be given regarding the AxS. It needs to be emphasised that the framework could be a topic of its own.⁸⁰ Indeed, for the purpose of this thesis, perhaps the three main questions related to sources are: what are general features of these official sources, what weight ought to be given to separate source

⁷⁵ Article 38, Statute of the International Court of Justice, *supra* note 67.

⁷⁶ Hilary Charlesworth, ‘Law-making and sources’, *supra* note 74, at 189.

⁷⁷ Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 3-6; and Michael Akehurst, *A Modern Introduction to International Law*, *supra* note 74, at 59. See also: Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 307; Leonard M. Hammer, *A Foucauldian Approach to International Law: Descriptive Thoughts for Normative Issues* (Ashgate Publishing Limited: Aldershot, 2007) at 9-13; Jan Klabbbers and Silke Trommer, ‘Peaceful Coexistence: Normative Pluralism in International Law’, in Jan Klabbbers and Tuomo Piirainen (Eds.) *Normative Pluralism and International Law* (Cambridge University Press: Cambridge, 2013) 67-93 at 92-93.

⁷⁸ Michael Akehurst, *A Modern Introduction to International Law*, *supra* note 74, at 59.

⁷⁹ Article 38, Statute of the International Court of Justice, *supra* note 67.

⁸⁰ See e.g. Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 303-385 Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 4-19; Maarten Bos, *A Methodology of International Law*, *supra* note 31, at 3, 56-57, 62-75; and preamble and Art. 26 VCLT, *supra* note 69, at 332.

groups, and especially what is the relevance of the work done by the ILC from the perspective of sources. The answers to these questions will provide the background for the responsibility issues of autonomous systems.

Treaty obligation is obviously seen as binding in international law. The reasoning is based on the display of consent by the ratifying state.⁸¹ Based on the principle *pacta sunt servanda*, which is an old customary law obligation and later also on VCLT treaty law obligation to the majority of states⁸², treaty law obligations are very much the core part of international law.⁸³ Regarding the substantive treaty law obligations, at present there are no conventions regulating specifically autonomous systems or making them illegal as such⁸⁴. However, there are many treaties that impose treaty obligations in the areas related e.g. to operational environment of AxS⁸⁵. One could argue that for the most of the states the whole sphere from planning, construction, selling and employing of AxS is full of treaty law obligations. This could be argued regardless of the fact that the treaty law obligations are based on the consent of states. There are treaties that are widely ratified hence putting obligations to great number of countries at once⁸⁶. From the perspective of state responsibility, treaty law is crucial especially for primary rules which are explained later in the thesis. Indeed, it is impossible to come to a conclusion that treaty law does not deal with autonomous systems just because there is no convention addressing the phenomenon specifically.

⁸¹ See e.g. Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 3-6; *Military and Paramilitary Activities*, *supra* note 16, at 136-137; and Geir Ulfstein, Thilo Marauhn and Andreas Zimmermann, 'Introduction', in Geir Ulfstein (Ed.) and Thilo Marauhn and Andreas Zimmermann (in collaboration) *Making Treaties Work: Human Rights, Environment and Arms Control* (Cambridge University Press: Cambridge, 2007) 3-12 at 4-5.

⁸² Preamble and Art. 26 VCLT, *supra* note 69; see also e.g. Malcom N. Shaw, *supra* note 13, at 94.

⁸³ Preamble and Art. 26 VCLT, *supra* note 69; see also e.g. Malcom N. Shaw, *supra* note 13, at 94.

⁸⁴ See e.g. MCDC, 'Legal analysis', *supra* note 29; Nils Melzer, 'Legal Implications of Lethal Autonomous Weapons Systems' (The CCW Meeting of Experts on Lethal Autonomous Weapons Systems, United Nations: Geneva)

[http://www.unog.ch/80256EDD006B8954/%28httpAssets%29/1145C5CF9CDC17BDC1257CD8005DF1E3/\\$file/Melzer_LAWS_IHL.pdf](http://www.unog.ch/80256EDD006B8954/%28httpAssets%29/1145C5CF9CDC17BDC1257CD8005DF1E3/$file/Melzer_LAWS_IHL.pdf), Last checked 19.01.2015.

⁸⁵ MCDC, 'Legal analysis', *supra* note 29; Kenneth Anderson, Daniel Reisner and Matthew Waxman, 'Adapting the Law of Armed Conflict to Autonomous Weapon Systems', *supra* note 54, at 398-406.

⁸⁶ See e.g. Protocol additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of international armed conflicts (Protocol I) (with annexes, Final Act of the Diplomatic Conference on the reaffirmation and development of international humanitarian law applicable in armed conflicts dated 10 June 1977 and resolutions adopted at the fourth session) (hereinafter *Additional protocol I*) Adopted at Geneva on 8 June 1977, Registered by Switzerland on 23 January 1979.

Customary law is the second source mentioned in Article 38(1) of the Statute. The basic way to conceptualise customary law is that it consists of two parts: (a) general, uniform and consistent state practice which is (b) accompanied with *opinio juris* meaning the belief of legal premises of the behaviour in question.⁸⁷ This has also been called ‘two element approach’⁸⁸. These two elements mean that it remains in the shoulders of the claimer (whether applicant or respondent) to show both of them when invoking customary law. Question is then what qualifies as the evidence of state practice or opinion juris. The elements that would suggest the existence of customary law are for example: actions, comments and other performances of state power (wherever it may be observed, for example General Assembly, hereinafter GA)⁸⁹, the judgments of ICJ⁹⁰, the judgments of Permanent Court of International Justice (hereinafter PCIJ)⁹¹, the judgments of other courts applying international law⁹², and crucially the work of the ILC⁹³.

Perhaps the most contemporary development regarding the customary law is the reframing work recently started by the ILC. In 2012 they set a topic ‘Formation and evidence of customary international law’⁹⁴. In the context of this work the special rapporteur proposed as the definition of customary law following: ‘(a) “Customary international law” means those rules of international law that derive from and reflect a general practice accepted as law’⁹⁵. By representing the cutting edge view of to the customary law, these suggestions to the ILC

⁸⁷ Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 6-12; Martin Dixon, *Textbook on International Law*, *supra* note 13, at 31-36. See also *North Sea Continental Shelf Cases* (hereinafter *North Sea Continental Shelf*) (*Federal Republic Of Germany/Denmark; Federal Republic Germany/Netherlands*), Judgment, ICJ Reports (1969), 3 at 25; *Military and Paramilitary Activities*, *supra* note 16, at 97-98.

⁸⁸ Michael Wood, *Second report on identification of customary international law by Michael Wood, Special Rapporteur* (A/CN.4/672, 5th May-6th June and 7th July-8th August 2014) 1-74 at 7-15.

⁸⁹ *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion (hereinafter *Legality of Nuclear Weapons Case*) ICJ Reports (1996) 226, at 253; and *Case Concerning the Continental Shelf (Libyan Arab Jarnahiriya/Malta)*, Judgment, ICJ Reports (1985) 13 at 28-29.

⁹⁰ Especially: *North Sea Continental Shelf*, *supra* note 87, at 25; and *Military and Paramilitary Activities*, *supra* note 16, at 97-98.

⁹¹ *Lotus Case*, *supra* note 19, at 26.

⁹² Fausto Pocar, ‘Statute Of The International Criminal Tribunal For The Former Yugoslavia’, (United Nations 2008) http://legal.un.org/avl/pdf/ha/icty/icty_e.pdf, Last checked 15.12.2014, 1-6 at 2.

⁹³ ILC, ‘Formation and evidence of customary international law/Identification of customary international law’ (2014) http://legal.un.org/ilc/guide/1_13.htm, Last checked 15.12.2014.

⁹⁴ Michael Wood, *supra* note 88, at 2.

⁹⁵ Michael Wood, *supra* note 88, at 7.

by the special rapporteur explain two elements – derivation and reflection of the general practice as law⁹⁶.

Based on the nature of customary law, two especially relevant aspects for the purpose of the thesis remain. On the one hand, there is not that much data concerning state practice, especially combined with opinion juris, related to AxS as such⁹⁷. The state practice that exists surely is not universal at the moment – not the least because of absence of global use of autonomous systems. However, it is always possible that such state practice based on the opinio juris starts to emerge and that could create new binding international legislation related to autonomous systems in the future.

Second aspect is that the customary law is visible in the context of state responsibility doctrine both in primary and secondary⁹⁸ norm sense. The position adopted in the present thesis is somewhat a simplification representing perhaps dogmatic view on the role of the ILC⁹⁹. The original purpose of the ILC was to codify customary law¹⁰⁰. Indeed, it has been the role of the ILC to codify, and in some sense develop, international law from the very beginning of law commission¹⁰¹. From the perspective of consent as premise of international law, this is rather problematic. It is not the purpose of this thesis to resolve this problem. The doctrinal position that has been adopted here is based on the idea that, at the very least, the great majority of the ILC's work reflects customary law. The justification is that the ILC has not as such created law that would be unacceptable for international community. It might be a problematic position to occupy in wider sense. But for the purpose of this study it is accurate enough.

⁹⁶ See more Michael Wood, *Second report on identification of customary international law*, *supra* note 88.

⁹⁷ See AxS called "Monstermind": James Bamford, 'The most wanted man in the world' *Wired*, 22th August 2014, <http://www.wired.com/2014/08/edward-snowden/>, Last checked 19.01.2015.

⁹⁸ See chapter 2.2.2.

⁹⁹ See e.g. ILC, 'Introduction: Origin and background [...] of international law', *supra* note 23; and H.E. Rosalyn Higgins, 'Keynote Address', At the Sixtieth Anniversary of the International Law Commission 19th May, 2008, http://legal.un.org/ilc/sessions/60/ePresident_Higgins_Speeches_ILC%2060th.pdf, Last checked 19.01.2015.

¹⁰⁰ ILC, 'Introduction: Origin and background [...] of international law', *supra* note 23.

¹⁰¹ Sir Michael Wood, 'Statute of The International Law Commission', (United Nations, 2009), http://legal.un.org/avl/pdf/ha/silc/silc_e.pdf, Last checked 09.01.2014, 1-6.

Regarding the main source of this thesis, the ILC's ARSIWA, the role of ILC as codifier of customary international law is somewhat complex as well¹⁰². Indeed, there is no absolute certainty that all articles of that document reflect customary law¹⁰³. For this reason, in the present thesis a simplification has been done to presume that ARSIWA does reflect the contemporary international law without the detailed analysis of the issue. Detailed analysis of the customary law nature of each and every article of ARSIWA would have been impossible to do within the scope of the present thesis. The decision made here is based on the fact that the ILC has worked with ARSIWA for long period of time – the topic was first brought up in the first session of the ILC in 1949 and the articles were adopted by the ILC in 2001¹⁰⁴. It needs to be underlined that the status of ARSIWA is a draft that has been adopted by the ILC.

Still, it is possible to presume that at least the majority of them reflects the position of states. Additionally, very similar state responsibility notion has been referred to several times during the decades.¹⁰⁵ Also, the articles have gained importance in the context of the investment disputes regardless that the rules have originally meant for the use of state system disputes¹⁰⁶. As a criticism it might be argued that the compensation part of ARSIWA is somewhat contested since by merely observing state behaviour one can see that the conduct of states does not support globally followed compensation system for internationally wrongful acts¹⁰⁷. But since compensations have been framed out of the present thesis this will not cause problems.

The work of the ILC concerning the state responsibility for internationally wrongful acts and liability in the case of absence of wrongful acts are good examples of that codification of customary law¹⁰⁸. Hence, from the perspective of the present thesis customary law is a

¹⁰² Sir Michael Wood, 'Statute of The International Law Commission', *supra* note 101, at 2.

¹⁰³ Eric. A. Posner and Alan Sykes, *Economic Foundation of International Law* (The Belknap Press of Harvard University: Cambridge, 2013) at 121-125.

¹⁰⁴ ILC Yearbook 1949, *Summary Records and Documents of the First Session Including the report of the Commission to the General Assembly* (New York: United Nations, 1956) at 49-50. See also: Responsibility of States for internationally wrongful acts, GA Draft. Res. A/RES/62/61, 6th December 2007.

¹⁰⁵ Alain Pellet, 'The ILC's Articles On State Responsibility For Internationally Wrongful Acts And Related Texts', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 75-94 at 86-87.

¹⁰⁶ Martins Paparinskis, 'Investment Treaty Arbitration and the (New) Law of State Responsibility', 24:3 *EJIL* (2013), 617-647.

¹⁰⁷ Art. 36, ARSIWA, *supra* note 8.

¹⁰⁸ See more chapter 2.2.2 onwards.

crucial part of the international legal framework. While the contemporary customary law is indeed applicable, the future behaviour of states may add limitations to these rules – for example in the context of the harm that is allowed to be caused¹⁰⁹. It is therefore customary law that might end up being the most regulating force of autonomous systems - at least before comprehensive treaty on autonomous systems.

The third category of international law is the general principles of law. It is perhaps the most ambiguous source of law. Firstly, it needs to be noticed that ‘civilized nations’ part is not relevant for all practical purposes¹¹⁰. Otherwise the content remains unexplained in the Statute of the Court. Commentators have argued it to include notions like: ‘*principles of consent, reciprocity, equality of states, finality of awards and settlements, the legal validity of agreements, good faith, domestic jurisdiction, and the freedom of the seas*’¹¹¹. Following, general principles of law seem to contain a long history and the core of law itself¹¹². Therefore, examples of general principles can be found through comparative analysis of domestic sources¹¹³.

The relevance of general principles is embedded with all the action taken in the context of AxS. Obviously, general principles are especially important in the governance and setting up the explicit international laws concerning the autonomous system. These principles form such primary norms that cannot be challenged and might in certain context also support the secondary norms of state responsibility as well. It is therefore clear that these norms are relevant for the analysis of autonomous systems and state responsibility. Additionally, general principles are great tools for the interpretation of other norms in the AxS context as well.¹¹⁴

¹⁰⁹ Draft articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries, (hereinafter: Articles on Prevention of Transboundary Harm) (A/56/10, ILC Yearbook 2001, vol. II[2]).

¹¹⁰ Hilary Charlesworth, Law-making and sources, *supra* note 74, at 189.

¹¹¹ Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 19.

¹¹² Antônio Augusto Cançado Trindade, *International Law for Humankind*, *supra* note 67, at 56-59.

¹¹³ *La Grand Case (Germany v. United States of America)* Judgment, ICJ Reports, 466 at 482. See also e.g. Case Concerning The Frontier Dispute (hereinafter *Frontier Dispute*) (*Burkina Faso/Republic Of Mali*), Judgment, ICJ Reports (1986) 554 at 564.

¹¹⁴ See chapter 2.2.2.

In the contemporary debate, the category d of Article 38(1) is perhaps the most topical way of 'locating' (and perhaps implicitly creating) international law in the area of autonomous systems¹¹⁵. The category d contains two elements: judicial decisions and the teachings of the most highly qualified publicists. These two possess different qualities as sources of law¹¹⁶. Firstly, the judicial decisions are not binding as such but they show the elements and existence of customary law¹¹⁷. Indeed, the ICJ for example does not strictly follow the doctrine of precedence but previous cases are still quoted by the Court as reasoning¹¹⁸. Therefore judicial decisions might be considered as subsidiary interpretation tools or even the evidence for other sources of law, namely customary law or general principles of law. The teachings of highly qualified publicist on the other hand are providing additional advisory material for the Court(s). Yet, regardless that there are many who have contributed to the international legal thought as such, there are not too many who have actually be quoted by the judges of the Court as such¹¹⁹. Indeed, the ICJ judgements themselves seldom include straight references to the individual authors. However, dissenting and separate opinions tend to include such authors much more often. Also, oral pleadings before the Court might include references to this category as well.¹²⁰ Hence, it is clear that the most highly merited academic debate does influence the application of international law as well. In the context of present thesis judicial decisions are extremely important guidelines to the application of primary and secondary rules of international law and state responsibility. There is a lot of contemporary academic debate over autonomous systems – including issues of international law¹²¹. Also,

¹¹⁵ See also: MCDC, 'Legal analysis', *supra* note 29; and Noel Sharkey, 'Saying 'No!' to Lethal Autonomous Targeting', *supra* note 51. Also: Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 24-25.

¹¹⁶ Article 38 (1d), Statute of the International Court of Justice, *supra* note 67.

¹¹⁷ Ian Brownlie, *Principles of Public International Law*, *supra* note 20, 2008, at 19-24; see e.g. *Case Concerning Maritime Delimitation and Territorial Question between Qatar and Bahrain* (hereinafter *Maritime Delimitation and Territorial Qatar v. Bahrain Maritime Delimitation and Territorial Questions case*) (*Qatar v. Bahrain*), Judgment, (2001) 40 at 76-77.

¹¹⁸ Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 21-22.

¹¹⁹ Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 24-25. See also e.g. Michael P. Scharf, Customary International Law in Times of Fundamental Change: Recognizing Grotian Moments, *supra* note 4, at 1-11.

¹²⁰ Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 25-27.

¹²¹ See e.g. Noel Sharkey, 'Saying 'No!' to Lethal Autonomous Targeting', *supra* note 51; Neil M. Richards, William D Smart, 'How Should the Law Think About Robots?' (Preliminary Draft) (2013) <http://ssrn.com/abstract=2263363>, Last checked 19.01.2015; and Keith Kirkpatrick, Keith Kirkpatrick, 'Legal Issues with Robots' Society, 56:11, 2013, 17-19 at 17-19.

the autonomous systems debate is linked to other debates within the area of international law – as targeted killing for example¹²².

The question, what are the sources of international law, is closely linked to the question why are international obligations still followed in such large scale and even in cases when it might be against state's narrow self-interest¹²³. One needs to remember that even somewhat complex applicability of international law in courts¹²⁴ is only one way to invoke international law. In other contexts, for example as part of general foreign politics, agents might use other, and non-globally accepted, sources as well. It is important to understand that those arguments might not carry the same weight in the ICJ, as they do in the domestic courts or domestic politics of that country. Indeed, in addition to juridical procedures, international law has value in politics, policies, communications, economics and warfare¹²⁵. These different ways of utilization of international law affect automatically the amount of applicable sources for the particular purpose. When discussing the issue of autonomous systems and responsibility of states, it is easy to see situations where something is claimed to be against or in accordance with international law – regardless of the sources the argument is based on. Still, especially since autonomous systems are just about to rise to popular use, the old formulations of international law are the reference points for contemporary legal analysis. Consequently, while there still remain complicated issues related the application of sources¹²⁶, it is somewhat clear that there are particularly specified sources that are applicable at the court level of international law. These sources are emphasized in the current thesis.

¹²² Claire Finkelstein, Jens David Ohlin, and Andrew Altman (Eds.) *Targeted Killing: Law and Morality in a Asymmetrical World* (Oxford: Oxford University Press, 2013).

¹²³ Jutta Brunée and Stephen J. Toope, *Legitimacy and Legality in International Law: An Interactional Account* (Cambridge University Press: Cambridge, 2010) at 94-98. See also Jan Klabbers and Silke Trommer, 'Peaceful Coexistence: Normative Pluralism in International Law', *supra* note 77, at 67-81 and 92-93.

¹²⁴ See also Martti Koskenniemi, *The Politics of International Law* (Hart Publishing: Oxford 2011) at 171-179.

¹²⁵ Martti Koskenniemi, *The Politics of International Law*, *supra* note 124, at 36-62 and 51-61. See also: Jan Klabbers and Touko Piiparinen, 'Normative Pluralism: An Exploration', in Jan Klabbers and Touko Piiparinen (Eds.) *Normative Pluralism and International Law: Exploring Global Governance* (Cambridge University Press: Cambridge, 2013) 13-34, at 17-24; David Kennedy, 'Lawfare and Warfare', in James Crawford and Martti Koskenniemi (Eds.) Surabhi Ranganathan (Ass. Ed.) *The Cambridge Companion to International Law* (Cambridge University Press: Cambridge, 2012) 158-183.

¹²⁶ Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 307-309.

2.2.2 Background for the law of international state responsibility

The historical discussion in this chapter is to provide context for the contemporary conception of responsibility. The starting point is that the historical notion of responsibility gives proper understanding of the development of the concept. It also makes easier to point out the most important parts of contemporary conception. Additionally, knowledge of the historical developments of the concept might help to understand possible future aspects and needs that evolution of the concept might bring.

The idea of state responsibility was evolved from more general understanding about legal responsibility¹²⁷. The Roman law idea of *jus gentium*¹²⁸ formed the early legal basis of responsibility in societies throughout Middle Ages. The term has its origin in the idea of collective responsibility which meant that an wrongful act of a foreign subject automatically justified response against the collective in question. From this notion onwards the theory of responsibility evolved towards differentiation of private acts and public acts – gradually but somewhat steadily.¹²⁹

The evolution of the idea of responsibility moved crucially forward when Hugo Grotius stated in the early 1625 edition of his book *De Jure Belli Ac Pacis* that '*there arises an Obligation by the Law of Nature to make Reparation for the Damage, if any be done.*'¹³⁰ Regardless that Grotius did not in the quotation above explicitly differentiate between individual and state responsibility, in the translation of the 1646 edition of the book¹³¹ he did comment on the responsibility of '*community*' on actions of its subjects by arguing that: '*A community, or its*

¹²⁷ Alain Pellet 2010, 'The Definition of Responsibility in International Law', *supra* note 13, at 4-6.

¹²⁸ Martti Koskenniemi, 'Colonization Of The "Indies" – The Origin Of International Law?' (Talk at the University of Zaragoza, December 2009) <http://www.helsinki.fi/eci/Publications/Koskenniemi/Zaragoza-10final.pdf>, Last checked 19.01.2015, at 2-12; Martti Koskenniemi, 'International Community' From Dante To Vattel', <http://www.helsinki.fi/eci/Publications/Koskenniemi/MKINTERNATIONAL%20COMMUNITY-08i.pdf>, Last checked 19.01.2015, 1-30 at 2-21.

¹²⁹ Tal Becker, *Terrorism and the State: Rethinking the Rules of State Responsibility* (Hart Publishing: Oxford, 2006) at 14.

¹³⁰ Hugo Grotius, *De Jure Belli Ac Pacis*, (1625), translated by Arthur E. Shaw et al., (*Of the RIGHTS of WAR and PEACE*) (Volume 2, London, 1715), Chapter XVII at 389. See also later edition translation: 'if damage has been caused, by the law of nature an obligation arises, namely, that the damage should be made good' in Hugo Grotius, *De Jure Belli Ac Pacis Libri Tres*, (1646), translated by Francis W. Keisley with the collaboration of Arthur E. R. Boak, Henry A. Sanders, Jesse S. Reeves and Herbert F Wright, and an Introduction by James Brown Scott, (*On the Law of War and Peace: Three Books*) (Volume 2, 1925), Chap. XVII at 430.

¹³¹ Hugo Grotius, *De Jure Belli Ac Pacis*, *supra* note 130.

rulers, may be held responsible for the crime of a subject if they know of it and do not prevent it when they could and should prevent it¹³². According to Grotius, community was not seen responsible for all action taken by individuals but liability might have risen because of the act or negligence of that community¹³³. This formulation he put forward was the basis for the notion of later (state) responsibility. Indeed, greatly because of Grotius, and other authors who echoed¹³⁴ and developed the idea¹³⁵, the theory of complicity (instead of complicity some call it classical¹³⁶) became the dominant framework of responsibility. Pursuant the theory, the state was responsible for acts of individuals if the state was complicit in the acts of individuals by not preventing (*patientia*) or punishing (*receptus*)¹³⁷. According to some authors the theory included a right of a sovereign to make claims also on behalf of other than their own subjects¹³⁸. The most relevant criticism of the theory started after the *Janes Case*¹³⁹ because several jurists thought that the distinction between public and private realms were not respected properly¹⁴⁰. Therefore complicity was amended to condonation theory. According to it, the responsibility did not rise through complicity but the *'failure to prevent and punish the wrongdoing amounted to a ratification or "condonation" of the act thus making it their own'*¹⁴¹. This theory then continued to develop into contemporary theory of state responsibility.

Clearly, the concept of damage and duty to make reparations formed the core of pre-modern responsibility argument. Here, the most notable precondition for responsibility was the

¹³² Hugo Grotius, *De Jure Belli Ac Pacis*, *supra* note 130, at 523.

¹³³ See e.g. Tal Becker, *'Terrorism and the State'*, *supra* note 129, at 14.

¹³⁴ Tal Becker, *'Terrorism and the State'*, *supra* note 129, at 15.

¹³⁵ Emer de Vattel, *The Law of Nations, Or, Principles of the Law of Nature, Applied to the Conduct and Affairs of Nations and Sovereigns, with Three Early Essays on the Origin and Nature of Natural Law and on Luxury* (Béla Kapossy and Richard Whitmore, Eds. with an introduction) (Liberty Fund: Indianapolis, 2008) at 189. See also, George Nolte, 'From Dionisio Anzilotti to Robert Ago: The Classical International Law of State Responsibility and the Traditional Primacy of a Bilateral Conception of Inter-state Relations', 13 *European Journal of International Law* (2002) 1083-1098 at 1085.

¹³⁶ Alan Pellet, 'The Definition of Responsibility in International Law', *supra* note 13, at. 5-6.

¹³⁷ Tal Becker, *'Terrorism and the State'*, *supra* note 129, at 14-15; Alan Pellet, 'The Definition of Responsibility in International Law', *supra* note 13, at 5-11.

¹³⁸ Emer de Vattel, *The Law of Nations*, *supra* note 135, at 199-211.

¹³⁹ *Laura M. B. Janes et al. (U.S.A.) v. United Mexican States*, Volume IV, RIAA, (1925) 82-98. See also: Tal Becker, *'Terrorism and the State'*, *supra* note 129, at 17-19.

¹⁴⁰ Tal Becker, *'Terrorism and the State'*, *supra* note 129, at 18-19.

¹⁴¹ Tal Becker, *'Terrorism and the State'*, *supra* note 129, at 19.

appearance of damage. The notion could thusly be described as damage based responsibility.¹⁴² Pursuant the Grotian and early post-Grotian theories, the understanding was that the damage suffered formed new relation between states in question resulting in responsibility and reparations¹⁴³. This view formed legal premise until the first part of the 20th century¹⁴⁴. The reason for it was mainly due to the Westphalian system of states and the concentration of power and security dominance¹⁴⁵.

The contemporary view on responsibility, which will be introduced in more detail in the following chapter(s), is more complex than just a system of compensations for damages. In fact, there are three major shifts compared with the classical continuum started by complicity theory: 1) responsibility is not only a matter of state following the fragmentation of international law and multiplication of (very least potential) subjects of international law¹⁴⁶; 2) the damage is no longer the requirement of responsibility; and 3) the notion of liability has evolved to a separate concept.¹⁴⁷

Consequently, the original idea that action taken leads to a new legal relationship between the actors in question has remained the same. However, legal conditions and content of that action have changed dramatically¹⁴⁸. Actually, the contemporary formulation of responsibility and state responsibility especially, is not civil or criminal but rather a new type of notion relationship¹⁴⁹.

¹⁴² Alan Pellet, 'The Definition of Responsibility in International Law', *supra* note 13, at 5.

¹⁴³ Alan Pellet, 'The Definition of Responsibility in International Law', *supra* note 13, at 5.

¹⁴⁴ See e.g. *Factory at Chorzów case*, *supra* note 16, paras. 3-4 and 21 and 26.

¹⁴⁵ See e.g. Hobbes Thomas, *Leviathan, or Matter, Forme, and Power of a Common Wealth Ecclesiasticall and Civill* (1651), Translated by Tuomo Aho from original (*Leviathan eli kirkollisen ja valtiollisen yhteiskunnan aines, muoto ja valta*) (Vastapaino: Tampere, 1999) at 121-125; James Der Derian, 'The Value of Security: Hobbes, Marx, Nietzsche, and Baudrillard', in Ronnie D. Lipschutz (Ed.) *On Security* (Columbia University Press: New York 1995) 24-45 at 25; Barry Buzan and Lene Hansen, *The Evolution of International Security Studies* (Cambridge University Press: Cambridge, 2009) at 23; R. B. J. Walker, 'The Subject of Security', in Keith Krause and Michael C. Williams (Eds.), *Critical Security Studies* (University of Minnesota Press: Minneapolis, 1997) 61-68 at 67.

¹⁴⁶ See e.g. *Reparation for Injuries Case*, *supra* note 17.

¹⁴⁷ Alan Pellet, 'The Definition of Responsibility in International Law', *supra* note 13, at 6. See also e.g. Katja Creutz, 'International Responsibility and Problematic Law-Making', in Rain Liivoja and Jarna Petman (Eds.) *International law-making: essays in honour of Jan Klabbers* (Routledge: Milton Park, 2014) 171-189.

¹⁴⁸ Alan Pellet, 'The Definition of Responsibility in International Law', *supra* note 13, at 8.

¹⁴⁹ Martti Koskeniemi, *Solidarity Measures*, *supra* note 17, at 337-339; and Alan Pellet, 'The Definition of Responsibility in International Law', *supra* note 13, at 12-15.

2.2.3 Contemporary regime of state responsibility (and other forms of responsibility including)

Contemporary state responsibility is the most comprehensively formulized in the ILC articles on Responsibility of States for Internationally Wrongful Acts (ARSIWA), and its commentaries¹⁵⁰. The codification of state responsibility was one of the first issues on the ILC's agenda in 1949¹⁵¹. However, it needs to be highlighted that this was not the first attempt to codify state responsibility¹⁵². Yet, the ILC's process has been so far the most comprehensive and, at least to some extent, successful. During the decades, the ILC's work included reports from special rapporteurs¹⁵³ and multiple readings of the draft articles¹⁵⁴. Obviously, this work has been commented, accompanied and applied with courts cases¹⁵⁵ and multiple writings of several authors¹⁵⁶. Finally, these articles were adopted in the fifty-third session of the ILC. Regardless of the comprehensiveness of the work, the legal force of these articles has also faced some criticism¹⁵⁷. This criticism has to be taken seriously when considering the usage of the articles. Still, as already said, in this occasion ARSIWA will be held to represent the contemporary view of state responsibility in international law.

¹⁵⁰ ARSIWA, *supra* note 8. See also: Robert P. Barnidge, 'The Due Diligence Principle Under International Law', http://www.academia.edu/430200/The_Due_Diligence_Principle_Under_International_Law, Last checked 19.01.2015, 1-65 at 2-7.

¹⁵¹ Yearbook of the International Law Commission 1949: *Summary Records and Documents of the First Session including the report of the Commission to the General Assembly*, *supra* note 104, at 281.

¹⁵² See e.g. Institute of International Law (hereinafter IIL), *Draft on "International Responsibility of States for injuries on their territory to the person or property of foreigners"*, (1927), Reprinted in Report on International Responsibility by Mr. F.V. Garcia-Amador, Special Rapporteur, (A/CN.4/96, ILC Yearbook 1956, vol. II) at annex 8; *Text of articles adopted in first reading by the Third Committee of the Conference for the Codification of International Law* (Hague: 1930), Reprinted in Report on International Responsibility by Mr. F.V. Garcia-Amador, Special Rapporteur, (A/CN.4/96, ILC Yearbook 1956, vol. II) at annex 3; and Harvard Law School, *Draft Convention on "Responsibility of States for damage done in their territory to the person or property of foreigners"* (1929) Reprinted in Report on International Responsibility by Mr. F.V. Garcia-Amador, Special Rapporteur, (A/CN.4/96, ILC Yearbook 1956, vol. II) at annex 9.

¹⁵³ See e.g. Garcia-Amador, 'In Connexion with The Subject Of State Responsibility: Report Of The First Special Rapporteur' [sic.], in *Documents of the fifteenth session including the report of the Commission to the General Assembly* (A/CN.4/SER.A/1963/ADD.1, ILC Yearbook 1956, vol. II), 178-185 at 178-179.

¹⁵⁴ See e.g. James Crawford, 'Articles On Responsibility Of States For Internationally Wrongful Acts' (United Nations, 2012) http://legal.un.org/avl/pdf/ha/rsiwa/rsiwa_e.pdf, 1-10 at 1-2.

¹⁵⁵ See e.g. *Gabčikovo-Nagymaros Project*, *supra* note 20, at 37; and *Case Concerning East Timor (Portugal v. Australia)*, Judgment (ICJ Reports, 1995) 90 at 92.

¹⁵⁶ See e.g. Martti Koskeniemi, 'Solidarity Measures', *supra* note 17, 337-356; James Crawford, 'Articles On Responsibility Of States For Internationally Wrongful Acts', (2012) *supra* note 154, at 1-2; and Tal Becker, 'Terrorism and the State', *supra* note 129.

¹⁵⁷ Eric. A. Posner and Alan Sykes, *Economic Foundation of International Law*, *supra* note 103, at 121-125.

Pursuant ARSIWA, states are responsible for international wrongful acts, including omissions, if these acts or omissions are attributable to them under international law¹⁵⁸. Therefore, the first thing to observe is that it is internationally wrongful act, not damage, which is precondition for state responsibility¹⁵⁹. Following this premise, one can conceptualise two types of norms¹⁶⁰. Firstly, a primary norm establishes an international obligation¹⁶¹. The obligation is the standard which, if violated, would form internationally wrongful act. The other norm type is the secondary norm and their purpose is to: “*provide for the consequences of the breach of primary obligations*”¹⁶². This division is somewhat artificial and its acceptance was heavily debated during the ARSIWA drafting process. Still, the accepted model of division between the norms is in a general level rather unproblematic.¹⁶³ Indeed, it has to be held that division has its purpose regardless artificial aspects it might contain.

As explained before, the breach of an obligation can be done by an act or an omission. Indeed, there is no substantial difference whether wrongfulness is due to an explicit act or committed because of an omission. From the perspective of state responsibility doctrine both are equal.¹⁶⁴ Also, the primary norm obligations can arise from any source of international law¹⁶⁵. There is no discrimination between them – still keeping in mind the relevance of different types of sources¹⁶⁶. It is therefore evident that it is not possible to analyse all the possible material breaches in any given context. This is also the case concerning autonomous systems. However, through specification of the context, breaches of the primary norm can be narrowed at least to a certain level. In the present thesis, this

¹⁵⁸ Arts. 1-2, ARSIWA, *supra* note 8.

¹⁵⁹ Art 1 and commentary (3), ARSIWA, *supra* note 8.

¹⁶⁰ See e.g. *Second report on State responsibility*, by Roberto Ago, *Special Rapporteur - the origin international responsibility* (A/CN.4/233, ILC Yearbook 1970, vol. II.) 177-197 at 179 and 193-195.

¹⁶¹ Martti Koskenniemi, ‘Solidarity Measures’, *supra* note 17, at 339.

¹⁶² Martti Koskenniemi, ‘Solidarity Measures’, *supra* note 17, at 339; See also e.g. Kimberley N. Trapp, *State Responsibility for International Terrorism* (Oxford University Press: Oxford, 2011) at 3-8.

¹⁶³ Eric David, ‘Primary and Secondary Rules’, in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 27-33 at 27-29.

¹⁶⁴ Art. 2 and commentary (7), ARSIWA, *supra* note 8.

¹⁶⁵ Arts. 2 and commentary (7) ARSIWA, *supra* note 8. See also: *Case concerning the difference between New Zealand and France concerning the interpretation or application of two agreements (hereinafter Rainbow Warrior case)*, RIAA 20 (1990), 215-284 at 241.

¹⁶⁶ See chapter 2.2.1.

exercise is done in Chapter 3 through scenario analysis. Hence, clearly the context specificity is very important in the modern state responsibility doctrine¹⁶⁷. Based largely on the specificity requirement of state responsibility situations ARSIWA was structured to contain secondary norms which mainly concentrate on the establishment of attribution, reasons to preclude wrongfulness and different elements of consequences of breaches¹⁶⁸. These will be analysed in more detailed way in the following sub-chapters.

In the context of contemporary state responsibility doctrine, the notion put forward by Hersch Lauterpacht, concerning the general development of international law, seem to be quite relevant. Pursuant the theory, the progress of international law is based on the domestic law – such as property, contract or procedure¹⁶⁹. The development of the general notion of responsibility into the contemporary state responsibility doctrine seemed to have followed this pattern – at least to a certain extent. However, simultaneously it can be argued that, similarly to development of general international law, the lack of enforcement has hindered functioning of the state responsibility regime. This has separated it to a particular type of international regime.¹⁷⁰ Therefore the contemporary state responsibility system includes the notion of states being responsible for internationally wrongful acts but it does not specify consequences of those acts from the enforcement perspective. ARSIWA includes provisions concerning compensations¹⁷¹ but because it lacks tools of enforcement, their effect of them can be criticised. Yet, the impact of the international law created by these draft articles is in crystallising the contemporary formula of state responsibility.

2.3 Applicability and limits of contemporary state responsibility in the context of autonomous systems

The premise for the thesis is that the general elements of the doctrine of international law and state responsibility are applicable in the context of the AxS¹⁷². There is no foreseeable

¹⁶⁷ See e.g. Ian Brownlie, *Principles of Public: International Law*, *supra* note 20, at 442-443.

¹⁶⁸ General commentary and e.g. Arts. 20-23, ARSIWA, *supra* note 8.

¹⁶⁹ Martti Koskenniemi, 'Solidarity Measures', *supra* note 17.

¹⁷⁰ Martti Koskenniemi, 'Solidarity Measures', *supra* note 17. See also e.g. Katja Creutz, 'International Responsibility and Problematic Law-Making', *supra* note 147.

¹⁷¹ Art. 36, ARSIWA, *supra* note 8.

¹⁷² See e.g. MCDL, 'Legal analysis', *supra* note 29.

reason to think otherwise. Yet, much complexity remains regarding the actual application. The issues of attribution, determining the agent of state and state action, circumstances precluding wrongfulness and ultra vires actions are such issues that have specific features in the context of autonomous systems. Additionally, due diligence and acts not prohibited by international law will be discussed as well, however, these features are there to help to understand the complex limits of state responsibility doctrine – not to divide the attention as such. Obviously, the emphasis is all the time on relevant issues for autonomous systems.

2.3.1 General applicability of the doctrine

The heating debate over the legal aspects of autonomous systems has so far produced rather little depth analysis on the precise issue of state responsibility and AxS. The ones so far are meant mainly to be discussion openers on the policy level¹⁷³. It seems that the topic of state responsibility has been shadowed by the greater interest towards humanitarian law, targeting reasons and legality of autonomous weapons in general¹⁷⁴. Though, some commentators do recognise the importance of state responsibility doctrine in the autonomous weapon systems context as well¹⁷⁵.

Regardless of the lack of comprehensive state responsibility analysis so far, it has already been established that there is no legal reason why the doctrine of state responsibility would not be applicable in context of autonomous systems¹⁷⁶. The applicability of state responsibility is not technology or action specific. Indeed, from the perspective of state responsibility, these new technologies do not change general aspects of state responsibility as such. As *lex generis*, the state responsibility rules argue that all internationally wrongful actions which are attributable to state fall within the scope of the doctrine. The international

¹⁷³ MCDC, 'Legal analysis', *supra* note 29. Compare to: Kenneth Anderson and Matthew Waxman, 'Law and Ethics for Autonomous Weapon Systems', *supra* note 33.

¹⁷⁴ See e.g. MCDC, 'Legal analysis', *supra* note 29; Noel Sharkey, 'The evitability of autonomous robot warfare', *supra* note 44; and Claire Finkelstein, Jens David Ohlin, and Andrew Altman (Eds.), *Targeted Killing: Law and Morality in a Asymmetrical World*, *supra* note 122.

¹⁷⁵ See e.g. ICRC, *Report of the ICRC Expert Meeting on 'Autonomous weapon systems: technical, military, legal and humanitarian aspects'*, *supra* note 56.

¹⁷⁶ E.g. MCDC, 'Legal analysis', *supra* note 29, at 16. Compare: Keith Kirkpatrick, 'Legal Issues with Robots', *supra* note 121.

wrongful acts are acts have to be defined by an international norm – regardless of the origin of the norm¹⁷⁷. In the Rainbow Warrior case it was noticed:

The reason is that the general principles of International Law concerning State responsibility are equally applicable in the case of breach of treaty obligation, since in the international law field there is no distinction between contractual and tortious responsibility, so that any violation by a State of any obligation, of whatever origin, gives rise to State responsibility¹⁷⁸

It is thus clear that every action that is a breach of international obligation gives rise to state responsibility also in the context of autonomous systems. The applicability of the doctrine cannot be questioned. Applicability of the doctrine would also need the attribution of an act to a state. This question will be dealt in next sub-chapter since it cannot be separated from the question of state agent.

In addition, it needs to be mentioned that there might be liability questions related to the harm caused to another state even in situations when there are no breaches of international obligations. This doctrine of international law will be discussed later in the thesis as well. Though, from applicability perspective, it is important to realize that breach of an obligation and causing harm could form under two different legal doctrines.

2.3.2 Internationally Wrongful Act, State Agent, Act of State and Attribution

In this chapter the main focus is on internationally wrongful act, attribution of an act to a state and the definition of a state agent. These aspects are inseparably linked in the AxS context as well. It is therefore crucial to define what could be described as the basic elements of wrongful act in this context; who can be an agent of state; and what kind of actions by them can be constituted as state action. After that the requirements of attribution of such acts will be discussed. Obviously, throughout the chapter the focus is in the context of AxS.

¹⁷⁷ Alain Pellet, 'The Definition of Responsibility in International Law', *supra* note 13, at 20-25.

¹⁷⁸ *Rainbow Warrior case*, *supra* note 165, at 251.

It needs to be established that autonomous systems are not, even in military use, illegal per se¹⁷⁹. In fact, in order AxS to be illegal there ought to be either a general norm (*lex generalis*) or special norm (*lex specialis*) to forbid use, effects or the used materials of autonomous system in question¹⁸⁰. The first one would need specifically related norms prohibiting autonomic actions of machines. There does not exist one. There are ethical concerns made by some¹⁸¹ but not legal rules specifically demanding that human has to be the one making decisions. Regarding the effects of autonomous systems there exists many rules limiting the allowed action, the scope of the effects and minimum due diligence regarding preparations and building of autonomous systems.¹⁸² Yet, if all of these primary rules are met, it is hard to see the reason why AxS could invoke state responsibility.

As said, the uses of autonomous systems are subjected to all the norms of international law as any new technology. For example in military context AxS has to be able to make distinction between military and civilian targets¹⁸³, follow principle of avoiding the superfluous injury and indiscriminate weapon prohibition¹⁸⁴ as any new operational and technological change. The obligation to take these issues into account is almost a universal treaty obligation for any weapon systems developer¹⁸⁵. Similarly non-weapon systems are subjected to specific rules regulating domain in question¹⁸⁶. From international wrongful act perspective this means that norm breaches can the most probably be found from the functions of the system. Indeed, without a separate action that leads to a norm breach, AxS itself would not constitute international wrongful act. Such breaches can arise from any area of international law – e.g

¹⁷⁹ See e.g. MCDC, 'Legal analysis', *supra* note 29.

¹⁸⁰ Marti Koskenniemi (finalized), *Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law: Report of the Study Group of the International Law Commission* (21 The Eric Castren Institute Research Reports: Helsinki, 2007) at 30-114.

¹⁸¹ Noel Sharkey, 'Saying "No!" to Lethal Autonomous Targeting', 9 *Journal of Military Ethics*, *supra* note 51; Human Rights Watch and International Human Rights Clinic, 'Losing Humanity: The Case Against Killer Robots', www.hrw.org/sites/default/files/reports/Losing%20Humanity%20Executive%20Summary.pdf, Last checked 09.01.2015; and Noel Sharkey, 'The Evitability of Autonomous Robot Warfare', *supra* note 44.

¹⁸² See e.g. 2.3.6. and 2.3.7.

¹⁸³ MCDC, 'Legal analysis', *supra* note 29, at 16.

¹⁸⁴ MCDC, 'Legal analysis', *supra* note 29, at 15-16.

¹⁸⁵ Additional protocol I, *supra* note 86.

¹⁸⁶ In maritime context see e.g. United Nations Convention on the Law of the Sea (UNCLOS). 10th December 1982, in force 16th November 1994, 1833 UNTS.

maritime law or law of armed conflict. In the context of such a breach, wrongful act can be invoked pursuant the general rule of state responsibility.

The question of the state agent is somewhat case specific. However, some clear cut rules and interpretations do exist. The most evident issues of state agent are disclosed in ARSIWA¹⁸⁷. The main rules are that conduct of any state organ and individual acting on behalf of a state¹⁸⁸ is an act of a state if they are empowered by law to exercise elements of governmental authority¹⁸⁹. It is actually enough if a person or group of persons: *is in fact acting on the instructions of, or under the direction or control of, that State in carrying out the conduct*¹⁹⁰. In these situations acts are attributable to that state even if an individual or an organ: *'exceeds its authority or contravenes instructions'*¹⁹¹. Also, in ARSIWA there is a special provision if act is conducted in the absence or default of official authorities:

The conduct of a person or group of persons shall be considered an act of a State under international law if the person or group of persons is in fact exercising elements of the governmental authority in the absence or default of the official authorities and in circumstances such as to call for the exercise of those elements of authority.¹⁹²

The most notable issue from autonomous systems perspective is that it is always a human that creates the condition of attribution. In this sense attribution is not due to that system itself but because of the human behind it. In addition, according to the articles a state can acknowledge action, which would not otherwise be attributable to it, as its own and thus making the act of that particular state¹⁹³. These situations were perhaps the clearest examples of attribution. To conclude, in normal situations conduct of regular citizens is not attributable to state. This provision includes exemptions which are discussed later¹⁹⁴.

¹⁸⁷ Arts. 4-11, ARSIWA, *supra* note 8.

¹⁸⁸ Art 4(1-2), ARSIWA, *supra* note 8.

¹⁸⁹ Art. 5, ARSIWA, *supra* note 8.

¹⁹⁰ Art. 8, ARSIWA, *supra* note 8.

¹⁹¹ Art 7, ARSIWA, *supra* note 8.

¹⁹² Art. 9, ARSIWA, *supra* note 8.

¹⁹³ Art. 11, ARSIWA, *supra* note 8.

¹⁹⁴ Chapter 2.3.7.

It is also worth mentioning that attribution will change if a state organ is placed at the disposal of another state. In this very precise and limited case, the acts of that organ are attributable to the new state in question.¹⁹⁵ Finally, the attribution of conduct in cases of insurrectional or other such movement is also regulated in the articles¹⁹⁶. These situations would also change the attribution of those units operating AxS accordingly.

Regarding the issue of attribution, the main rules are rather simple. The matter itself is the main part of the secondary norms of state responsibility doctrine. Pursuant ARSIWA attribution is a requirement for state's international wrongful act¹⁹⁷ and, as explained above, the conduct of any organ or person acting in official capacity will entail such attribution¹⁹⁸. It is necessary to underline that state act can also be an omission¹⁹⁹ which in the context of autonomous systems might be as probable as 'positive' action. Hence, even when the rule of attribution is clear, the actor and act of state are defined in particular context always separately²⁰⁰. In the AxS context, the analysis seems to be even more relevant since the machine itself is not an agent of a state and thus the 'act of state' is not de jure done by autonomous systems. In order to illustrate this, it is useful to take a look at similarly technologically orientated area of law, for example so called international cyber law (or international information law)²⁰¹. The rule of attribution has been applied in the cyber warfare context by the international law specialists of NATO²⁰². According to this so called Tallinn Manual, the mere fact that an act is taking place through (cyber) infrastructure is not an automatic proof of attribution²⁰³. This logic has already been applied in the context of

¹⁹⁵ Art. 6 and Commentaries (1-9), ARSIWA, *supra* note 8.

¹⁹⁶ Art. 10, ARSIWA, *supra* note 8.

¹⁹⁷ Art. 2., ARSIWA, *supra* note 8.

¹⁹⁸ Art. 4., ARSIWA, *supra* note 8.

¹⁹⁹ Art 2, ARSIWA, *supra* note 8.

²⁰⁰ e.g. *Finnish Ships Arbitration*, *supra* note 16 and *Claim of the Salvador Commercial Company ("El Triunfo Company")* (Hereinafter *Salvador Commercial Company*), Volume XV RIAA (1902) 468-479 at 476-477; *D. Earnshaw and Others (Great Britain) v. United States (Zafiro case)* (Hereinafter *Zafiro case*) Volume VI, RIAA (1925) 160-165 at 163-165.

²⁰¹ See more e.g. Ian J. Lloyd, *Information Technology Law* (6th Ed., Oxford University Press: Oxford, 2011).

²⁰² International Group of Experts at the Invitation of the NATO Cooperative Cyber Defence Centre of Excellence, in Michael N. Schmitt General (Ed.), *Tallinn Manual on the International Law Applicable to Cyber Warfare* (Cambridge University Press: Cambridge, 2013) Rule 6, at 29-34.

²⁰³ International Group of Experts at the Invitation of the NATO Cooperative Cyber Defence Centre of Excellence, in Michael N. Schmitt General (Ed.), *Tallinn Manual on the International Law Applicable to Cyber Warfare*, *supra* note 202, Rule 7-8, at 34-35.

autonomous systems Policy Guidance as well²⁰⁴. Indeed, there has to be a person or a group of persons who constitute the responsibility of state. The technology only points out those people. Though in real life situations, it will vary how easy it is to establish the attribution – depending on an autonomous system in question.

Therefore following ARSIWA, the AxS itself cannot be the state agent²⁰⁵. The entity of state is someone who can act on the capacity of a state as explained earlier. Since, in a legal sense, a machine cannot act on behalf of a state as a human or an entity of humans do. This would mean that it is the status of operator that decides whether the applicability of a state responsibility doctrine is fulfilled. It is rather obvious that the degree of autonomy of AxS is a crucial factor when one is making the determination who is this person. The three different degrees of autonomy²⁰⁶ has to be dealt differently since in every context the role of the state agent is different.

Firstly, if a human is in the loop, the AxS is actually just a technical solution fully controlled by the operator and the command hierarchy in place. Thus, in this context the state agent is clearly the operator, and possibly his superior in accordance with responsibilities of superiors²⁰⁷. Hence, in these cases attribution to the state clearly exists. In the second scenario, a human is on the loop – supervising the actions of AxS. In this context, the state agent is again the operator and his superior. I would argue this since the action of the AxS is controlled and linked to a human working on behalf of a state. In the case of fully non-predictable situations, there might be room for an argument that wrongfulness is precluded – e.g. on the basis of force majeure²⁰⁸.

Third scenario is the hardest to conceptualize because if human is off the loop, the state agent is not in immediate connection with the autonomous system. This makes the nexus somewhat distant and complex. I would entertain three aspects that might all have some

²⁰⁴ MCDC, 'Legal analysis', *supra* note 29, at 16

²⁰⁵ See e.g. MCDC, 'Legal analysis', *supra* note 29, at 16.

²⁰⁶ See chapter 2.1.

²⁰⁷ E.g. in the context of: Article 28, Rome Statute of the International Criminal Court, A/CONF.183/9, 17th July 1998 and corrected by process-verbaux of 10th November 1998, 12th July 1999, 30th November 1999, 8th May 2000, 17th January 2001 and 16th January 2002, in force 1st July 2002.

²⁰⁸ See chapters 2.3.3.4.

relevance in the present context. These are: sender/activator of the machine; structural level meaning the command structure; and owner and manufacturer of the AxS when it is a state actor.

The role of activator of AxS has the closest link towards autonomous systems. There is a good reason to believe that activator, as the last human being in contact with the AxS, would fulfill the criteria laid out either in Article 4, 5 or 8 of ARSIWA depending on the nature of the particular situation. If one would accept that only sender or activator would constitute the state agent responsible for the AxS, then the acts of AxS would be acts of that particular state²⁰⁹. I will refer to the approach hereinafter as 'the last human theory'.

Yet, the other considerations need to be taken into account as well. In the context of the off-the-loop systems the structural level, described above, needs to be evaluated separately. It is obvious that the analysis of structural level has relevance for the agent of state analysis. Pursuant ARSIWA, the conduct of a state organ can be: *'exercises legislative, executive, judicial or any other functions, whatever position it holds in the organization of the State'*²¹⁰. Therefore it is evident that the acts of command chain are the official acts. In the cases when the last human and command structure come from different states, there is a relevant allocation problem of attribution. The comprehensive analysis is rather impossible and very situation specific. However, ARSIWA will provide a couple of possibilities. There is possibility of joint author of responsibility²¹¹. In these cases both states would 'own' the action and, hence, the internationally wrongful act as well. Yet this is not the only possibility and the issue of joint action will be dealt in more detail way in chapter 2.3.5. Other possibility would be situation where the operator would have been put under the command structure of another state²¹². In these cases, the operator would not constitute an action of the sender state but she or he would be considered as an actor of the new state. In this type of situations the responsibility for internationally wrongful acts would automatically be linked to the new state. Therefore, it is actually more relevant to argue that structure level might rule over 'the

²⁰⁹ Arts. 1-4, ARSIWA, *supra* note 8.

²¹⁰ Art. 4, ARSIWA, *supra* note 8.

²¹¹ Art. 47, ARSIWA, *supra* note 8.

²¹² Art 6 and commentaries (2-9), ARSIWA, *supra* note 8.

last human theory'. The exception to the rule is in cases of ultra vires action on the behalf of human actor²¹³.

The owning of an autonomous system is closely linked to the operator and structure level. In fact an owner of the system is the most probably at the very least complicit in the action – presuming that internationally wrongful act has happened. In those cases, the owner would be responsible either because of being the operator or because of the structure level reasons. Otherwise the system would have to be given away or taken from control. In the first case, the owner would be either former owner or lender of the machine. Selling situations have no specific provision in ARSIWA – when looking at the secondary norms of state responsibility. Similarly, if AxS would have been lent, it would be just a piece of technology – only regulated by the lending contract. The general rule of attribution would not be altered by this contract. The new user would be bound by its own obligations. Primary norms regulate the commerce; however, if these rules are followed state responsibility doctrine is not relevant for a seller or a lender of the machine. Stealing of an autonomous system might be problematic for the owner. However, if appropriate measures to protect the machine have been taken, the state would not be responsible for the action taken by the agent responsible for stealing. Yet, negligence might arise to the level of internationally wrongful act. These are still very much system specific primary norm obligations – not universally applicable to every AxS. Thusly, the role of owner does not bring anything new to the secondary norm side of state responsibility. Yet, the breach commercial contracts between states might initiate internationally wrongful act, however, the commerce of goods and services usually have *lex specialis* doctrines governing the area.

To summarise there is a clear nexus between the establishment of a state agent and attribution of a given action to a state. This link is the core of state responsibility doctrine. In cases of wrongful acts, if they are committed by an actor that will form a state organ, the act is attributable to state and thus state is responsible for it. The next chapter consists the analysis of the reasons to preclude wrongfulness of an international wrongful act.

²¹³ See chapter 2.3.4.

2.3.3 Circumstances precluding wrongfulness

The ILC doctrine of state responsibility includes explicit circumstances that would preclude wrongfulness. In ARSIWA these provisions are stipulated in their own Articles including the norms and possible limitation to them²¹⁴. The reasons to preclude wrongfulness was also introduced in the ILC's work by Robert Ago – known as Ago revolution²¹⁵. These articles have been part of the drafting process ever since and form a critical part of the doctrine. The doctrine includes also the article 27 which dictates the consequences of the invocation of these articles which include (a) obligation to follow a norm in question if reason to preclude it ends; and (b) *'the question of compensation for any material loss caused by the act in question'*²¹⁶. From these two the b is excluded from the analysis of the present thesis. Though, the compensations remain important, but very contested, part of the consequences of doctrine, and as such it is a topic of separate research.

2.3.3.1 Consent

Giving consent to an act of another state is a clear and candid way to preclude the wrongfulness of act. Thusly it is a reason to diminish responsibility for that particular act²¹⁷. Consent is situation specific and its scope is totally dependent on the state that is giving it²¹⁸. This is a basic international law principle²¹⁹, and regardless it has not been explicitly referred by the ICJ²²⁰, the Court has referred to similar principle in for example Armed Activities on the Territory of the Congo case²²¹. To be precise, consent does not modify the primary norm as it is but it changes the applicability of primary norm in that given moment. The reason to

²¹⁴ Arts. 20-26, ARSIWA, *supra* note 8.

²¹⁵ Second report on State responsibility, *supra* note 160, at 192-195 and Martti Koskenniemi, 'Solidarity Measures', *supra* note 17, at 339-340.

²¹⁶ Art. 27 (a-b), ARSIWA, *supra* note 8.

²¹⁷ Art. 20, ARSIWA, *supra* note 8.

²¹⁸ Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 309-325.

²¹⁹ Art. 20 and commentaries (1-2), ARSIWA, *supra* note 8.

²²⁰ Affef Ben Mansour, 'Circumstances Precluding Wrongfulness in the ILC Articles on the State Responsibility: Consent', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 439-453 at 439.

²²¹ *Case Concerning Armed Activities on the Territory of the Congo* (hereinafter *Armed Activities on the Territory of the Congo*) (*Democratic Republic of the Congo v. Uganda*), Judgment, ICJ Reports (2005) 168 at 196, 212-213 and 268-270.

preclude was debated during the drafting process of ARSIWA²²² and through this debate contemporary view pointing towards secondary norm was come up with.

Consent has to be valid in that it is given by the authority that has power to consent to the act of a foreign state in that particular situation²²³. Further, consent can only be given before an act or simultaneously when the act is taking place²²⁴ – acceptance given afterwards is called waiver²²⁵. It needs to be underlined that consent can be limited in terms of scope and time. Hence, the consent is neither open-ended nor unlimited.

A state cannot consent on behalf of another state and thus in bilateral relationships consent has more relevance than in cases where many states are involved. For example in the context of multilateral treaty, consent of one state does not change the status of other states towards that norm²²⁶. Hence, the consent is more easily applicable in the context of bilateral obligations than multinational or universal ones. Also, there are some cases of wrongfulness that cannot be consented to. Certain human right norms or humanitarian law obligations cannot be consented to or waived. Still, individual's voluntary consent can be taken into account in the application of certain rights as well.²²⁷

In the AxS context the consent has real relevance. Especial attention has to be given to possibility of consent when using the systems in planned situations. Consent is for example useful in regular cross-border use of AxS. Since, the notion of consent is available only before and at the same time the breach is happening, in high tempo situations it might be difficult to give consent for that particular act. The possible future bilateral treaties regulating the use of AxS ought to include the range and limitations of possible consent – this would take care the tempo problem. To summarise the relevance of consent in the present context, it is clear that the consent is at the centre of international use of AxS.

²²² Affef Ben Mansour, '[...] Consent', *supra* note 220, at 440.

²²³ Art. 20 and commentaries (4-8), ARSIWA, *supra* note 8.

²²⁴ Art. 20 and commentary (3), ARSIWA, *supra* note 8.

²²⁵ Art. 45 commentaries (4-5), ARSIWA, *supra* note 8. See also: *Case Concerning Certain Phosphate Lands in Nauru* (hereinafter *Certain Phosphate Lands in Nauru Case*) (*Nauru v. Australia*), Judgment, ICJ Reports (1992) 240, at 246-247.

²²⁶ Art. 20 and commentary (9), ARSIWA, *supra* note 8.

²²⁷ Art. 20 and commentary (10), ARSIWA, *supra* note 8.

2.3.3.2 Self-defence

The self-defence, being rather self-evident as a general concept, is a reason to preclude wrongfulness if it is in accordance with the United Nations Charter (UNC)²²⁸. Indeed, an act done in self-defence may justify the breach of norm that would normally constitute state's responsibility²²⁹. Clearly, self-defence is crucial part of international law²³⁰.

In the context of international law, the doctrine of self-defence is an old institution, applied in e.g. the Caroline incident²³¹ and perhaps only crystalized in the UNC²³². From the perspective of state responsibility there are two options to look at the issue: either you see self-defence as circumstance to preclude wrongfulness or simply as a right of a sovereign state²³³. The academic debate over the issue is concentrated on the question whether self-defence is the long lasting tradition of law and self-prevention arising from law of nature²³⁴; or a norm related as an exception to the prohibition of the use of force²³⁵. The latter view

²²⁸ Art. 21, ARSIWA, *supra* note 8; Arts. 2(4) and 51, UNC; and see also Jean-Marc Thouvenin, 'Circumstances Precluding Wrongfulness in the ILC Articles on State Responsibility: Self-Defence', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010), 455-467 at 457. See also Albrecht Randelzhofer, 'Article 2(4)', in Bruno Simma (Ed.) Hermann Mosler, Albrecht Randelzhofer, Christian Tomuschat and Rüdiger Wolfrum (collaboration) Helmut Brokelmann and Christian Rohde (Ass. Eds.) *The Charter of the United Nations: A Commentary* (Oxford University Press: Oxford, 1994) 106-128; and Albrecht Randelzhofer, 'Article 51', in Bruno Simma (Ed.) Hermann Mosler, Albrecht Randelzhofer, Christian Tomuschat and Rüdiger Wolfrum (collaboration) Helmut Brokelmann and Christian Rohde (Ass. Eds.) *The Charter of the United Nations: A Commentary* (Oxford University Press: Oxford, 1994) 661-878.

²²⁹ Art. 21 and commentary (2), ARSIWA, *supra* note 8

²³⁰ See e.g. Thomas M. Franck, *Recourse to Force: State Action against Threats and Armed Attacks* (Cambridge University Press: Cambridge, 2009).

²³¹ Anthony Clark Arend, 'International Law and the Preemptive Use of Military Force' 26:2 *The Washington Quarterly* (2003) 89-103 at 90-92.

²³² Jean-Marc Thouvenin, '[...] Self-Defence', *supra* note 227, at 455-456; Judith Gardam, *Necessity, Proportionality and the Use of Force by States* (Cambridge University Press: Cambridge, 2006) at 141-145. Dennis Alland, 'International Responsibility and Sanctions: Self-Defence and Countermeasures in the ILC Codification of Rules Governing International Responsibility', in Marina Spinedi and Bruno Simma (Eds.) *United Nations Codification of State Responsibility* (Oceana Publications, Inc.: New York, 1987) 2-33 at 2; Thomas M. Franck, *Recourse to Force*, *supra* note 230, 45-52; and Larry May, *Aggression and Crimes Against Peace* (Cambridge University Press: New York, 2008) at 126-129.

²³³ See e.g. Albrecht Randelzhofer, 'Article 51', *supra* note 228.

²³⁴ Hugo Grotius, *supra* note 130, at 397; see also Lindsey Cameron and Vincent Chetail, *Privatizing War: Private Military and Security Companies under Public International Law* (Cambridge University Press: Cambridge, 2013) at 11-17.

²³⁵ Jean-Marc Thouvenin, '[...] Self-Defence', *supra* note 227, at 456-459; see also e.g. *Addendum - Eighth report on State responsibility by Mr. Roberto Ago, Special Rapporteur - the internationally wrongful act of the State, source of international responsibility (part 1)*, (A/CN.4/318/Add.5-7, ILC Yearbook 1980, vol. II[1]) 14-86 at 53.

seems to be held by the majority of scholars, and following their argument self-defence can exist only in legal systems that have prohibited the use of force in general sense²³⁶. Some hold the thought as well that self-defence could, quite unclearly, be both – a right and a circumstance precluding wrongfulness²³⁷. Yet, from ontological (or epistemological) perspective and for the purpose of the present thesis, it is not feasible or beneficial to analyse matter further. From the AxS point of view, it is important to conclude that self-defence as such is related to the general prohibition of use of force – and has legal power as part of UN system.

The doctrine of self-defence will not preclude all types of wrongfulness – for example some humanitarian law and human rights obligations cannot be precluded on this basis²³⁸. Hence, while acting in self-defence, the notions of the laws of armed conflict do apply in AxS context as well. Precluding wrongfulness is, additionally, applied vis-à-vis defending and attacking state but this nexus does not automatically change the status of third states²³⁹. It needs to be understood that in cases of self-defence there might be obligations towards third state. For example, it would not be in accordance with the doctrine to simply overrun third state because of the need for self-defence against the aggressor state.

Substantively, the doctrine of self-defence is, at least originally, meant to apply in the situations of armed attacks²⁴⁰ governed by law of armed conflict (hereinafter LOAC). The court has argued that there appears to be: *'general agreement on the nature of the acts which can be treated as constituting armed attacks'*²⁴¹. In this context, the court further found that not only the hostile, potentially lethal, acts constituted the sole part of armed attack but: *'also assistance to rebels in the form of the provision of weapons or logistical or other support.'*²⁴² Thusly, the court argued that the whole chain of command, including targeting and supporting components, are part of the apparatus committing armed attack.

²³⁶ Jean-Marc Thouvenin, '[...] Self-Defence', *supra* note 227, at 457.

²³⁷ Jean-Marc Thouvenin, '[...] Self-Defence', *supra* note 227, at 459-461.

²³⁸ Art. 21 and commentaries (3-4), ARSIWA, *supra* note 8.

²³⁹ Art. 21 and commentary (5), ARSIWA, *supra* note 8; and *Legality of Nuclear Weapons Case*, *supra* note 89, at 257.

²⁴⁰ Art. 51, UNC, *supra* note 4.

²⁴¹ *Military and Paramilitary Activities*, *supra* note 16, at 103.

²⁴² *Military and Paramilitary Activities*, *supra* note 16, at 104; See also Lindsey Cameron and Vincent Chetail, *Privatizing War*, *supra* note 234, at 11-17.

Additionally, and regardless of the view of the Court explained above, there remains some vagueness and matters to discuss in the definition of the self-defence itself. For example in the UNC terms like attack or aggression are not explicitly specified even though they do appear in it for multiple times²⁴³. There is a General Assembly (hereinafter GA) resolution concerning the definition of aggression²⁴⁴ but as GA resolutions are not binding source of international law, it might lack legal power. Exactly, GA resolutions can only be counted as possible indications of customary law²⁴⁵. Additionally there is arguably difference between aggression and armed attack²⁴⁶. Hence, it is clear that not all aspects of self-defence can be addressed in the scope of present thesis.

Given that the exact limits of the self-defence remain contested²⁴⁷, there is possibility for the misuse of the notion. It is clear that the abuse of self-defence would not preclude wrongfulness²⁴⁸. The two main ways to abuse the concept are either not to meet the conditions of its legal exercise or the scope of self-defence spreads further than it is allowed²⁴⁹. For the AxS developers, this means rather exact and precise demands related to use of force. Indeed, in order there to be a credible argument of legal self-defence, the act of self-defence has to be founded on response to armed attack or really imminent and credible threat of it²⁵⁰. Furthermore, when acting in self-defence AxS needs to follow at least the principles of necessity, proportionality and discrimination²⁵¹. Thusly in order to preclude wrongfulness of act committed by AxS because of the excuse of self-defence the action taken cannot be too anticipatory, broad or untargeted.

²⁴³ Arts. 1(1), 39, 51, and 53 UNC, *supra* note 4. See also: Albrecht Randelzhofer, 'Article 51', *supra* note 228, at 668.

²⁴⁴ Definition of Aggression UN, GA Res. 3314 (XXIX), 14th December 1974.

²⁴⁵ See chapter 2.2.1.

²⁴⁶ Albrecht Randelzhofer, *Article 51*, *supra* note 228, at 668-669.

²⁴⁷ Jean-Marc Thouvenin, '[...] Self-Defence', *supra* note 227, at 459.

²⁴⁸ Jean-Marc Thouvenin, '[...] Self-Defence', *supra* note 227, at 462.

²⁴⁹ Jean-Marc Thouvenin, '[...] Self-Defence', *supra* note 227, at 462.

²⁵⁰ Albrecht Randelzhofer, *Article 51*, *supra* note 228, 662-678; Thomas M. Franck, *Recourse to Force*, *supra* note 230, at 45-52; and Daniel Bethlehem, 'Notes And Comments: Principles Relevant To The Scope Of A State's Right Of Self-Defense Against An Imminent Or Actual Armed Attack By Nonstate Actors', Vol. 106:000 *The American Journal of International* (2012), 1-8.

²⁵¹ See e.g. ICRC, 'Practice Relating to Rule 1. The Principle of Distinction between Civilians and Combatants', https://www.icrc.org/customary-ihl/eng/docs/v2_rul_rule1, Last checked 19.01.2015.

The questions of preventive self-defence²⁵² and whether the acts of individuals, namely e.g. terrorists, constitute armed attack are perhaps the most contemporary parts of the academic debate about the primary norms of self-defence. Yet in the present thesis, these aspects are not gone through more detailed way because of their magnitude and detailed analysis they require.

Time limitation is implicitly embodied in the UNC Article 51 as well. Pursuant the article: *until the Security Council has taken the measures necessary to maintain international peace and security*²⁵³. It is very questionable what are sufficient enough measures to fulfil this requirement – especially if the imminent and acute situation continues regardless of the actions taken by Security Council (hereinafter SC)²⁵⁴. Obviously, the actions of the SC are inseparably linked to the realm of international relations and this is a good example of highly politicised law of self-defence. Nevertheless, this provision cannot be neglected in legal sense either – also paradoxically because of the politics of it. Additionally, as a time limitation, it is obvious that if the other conditions of self-defence are exhausted the legal reason of precluding wrongfulness on the basis of self-defence also ends. In the AxS context it means that even self-defence actions, however autonomous they may be, ought to be able to be overrun if condition for self-defence ends or if SC has exercised its powers of ‘maintaining peace and security’. The type of stopping mechanism is rather irrelevant – e.g it can be an electronic command or kinetic stopping technique. Yet, it is evident that self-defence is not a *carte blanche*²⁵⁵ and thus in order to avoid the wrongfulness of the actions of AxS, the self-defence measures have to be able to stop if circumstances change.

Many of related questions are part of the evaluation of factual circumstances when engaging in an act of self-defence. Concerning autonomous systems it is clear that attack against autonomous systems might indicate aggression and thus justify self-defence measures. Additionally, autonomous systems can be the tool of self-defence as long as it follows the limits described above. It is therefore clear that as a reason to preclude wrongfulness self-

²⁵² See e.g. Jarna Petman, ‘Irakin sota, hegemonia ja kansainvälinen oikeus’, 33 *Kosmopolis* (2003) 11–32 at 15–19.

²⁵³ Art. 51, UNC, *supra* note 4.

²⁵⁴ Thomas M. Franck, *Recourse to Force*, *supra* note 230, at 49-51.

²⁵⁵ Thomas M. Franck, *Recourse to Force*, *supra* note 230, at 49.

defence is connected to autonomous systems very clearly. The self-reliant behaviour of machine is not changing the applicability of this notion in any way. Thus, for the developers of AxS the doctrine of self-defence means rather specific technical and operational requirements for very complex situations.

2.3.3.3 Countermeasures

As a reason to preclude wrongfulness, countermeasures have to be differentiated from self-defence. The main difference is perhaps the amount of possible actions that can be taken – countermeasures include more possibilities for a state to act where self-defence is always related to the use of force²⁵⁶. It was through Robert Ago's introduction of sanctions²⁵⁷ during the drafting process of ARSIWA, when countermeasures became reasons to preclude wrongfulness²⁵⁸. Countermeasures have two distinctive legal characteristics. Firstly, countermeasures, while still being a reason to preclude wrongfulness, pose a clear and willingly taken act against international obligation. Secondly, by the virtue of being a legal countermeasure it relieves the act of its illegal character. Hence the state in question is exonerated from the wrongfulness.²⁵⁹

Because of these two legal characteristics, during the drafting process the issue of countermeasures was heavily debated. For example for countries like Mexico²⁶⁰ the notion was contrary to the international peaceful coexistence of states²⁶¹. In the ICJ's *Gabčíkovo-Nagymaros Project* case the Court accepted the countermeasures, with some limiting conditions, as justifiable – e.g. pursuant the drafting reasoning done within the ILC process²⁶². Thus, one is keen to believe that according to the contemporary interpretation the countermeasures can be a reason to preclude wrongfulness even in the context of AxS.

²⁵⁶ Hubert Lesaffre, 'Circumstances Precluding Wrongfulness in the ILC Articles on State Responsibility: Countermeasures', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 469-480 at 469-471.

²⁵⁷ *Eighth report on State responsibility by Mr. Roberto Ago, Special Rapporteur – the internationally wrongful act of the State, source of international responsibility* (A/CN.4/318 and Add.1-4, ILC Yearbook 1979, vol. II[1]) at 39-47.

²⁵⁸ Martti Koskenniemi, 'Solidarity Measures', *supra* note 17, at 339; and Art. 22, ARSIWA, *supra* note 8.

²⁵⁹ Hubert Lesaffre, '[...] Countermeasures', *supra* note 255, at 469-470.

²⁶⁰ *State Responsibility: Comments and observations received by Governments*, (A/CN.4/488 and Add. 1-3, ILC Yearbook 1998, vol. II[1]) 81-174 at 132.

²⁶¹ Hubert Lesaffre, '[...] Countermeasures', *supra* note 255, at 470.

²⁶² *Gabčíkovo-Nagymaros Project*, *supra* note 16, 7, at 50.

One needs to examine whether an act against AxS could trigger countermeasures. Answer to this would be yes since states tend to consider the protection of their property as a demonstration of their sovereignty²⁶³. Thusly, the notion of legal countermeasures can be used to protect autonomous systems. The second view is the analysis of the AxS usability as an instrument of legal countermeasure. This is, once again, very situation specific. At the general level, nothing prevents to use autonomous technologies to fulfil the countermeasures themselves. However, countermeasures refer to a long list of different actions. In all of those situations, proportionality has to be obviously followed. The evaluated question is that is such technology available that could perform the countermeasure in such a way that it stays within the limits of legal countermeasures.

2.3.3.4 Force majeure

Tracing back to Roman law, in formation of *ad impossibilia nemo tenetur* (trans. nobody is held to the impossible²⁶⁴), force majeure is a classic excuse to avoid responsibility in many domestic legal systems. Also in the international realm it has been recognised as a general principle of law. For example the ILC has recognised the principle already in the context of the law of treaties – as have all the signatories as well.²⁶⁵ In the drafting process of ARSIWA, the ILC took a view that the concept of force majeure is connected to term fortuitous²⁶⁶ – actually regardless of the opposite view from Special Rapporteur Ago²⁶⁷. Hence, the ILC's formulation includes two parts. Firstly, force majeure can be invoked due to '*occurrence of an irresistible force or of an unforeseen event, beyond the control of the State, making it materially impossible in the circumstances to perform the obligation*'²⁶⁸. Additionally, pursuant the ARISIWA: '*Paragraph 1 does not apply if: (a) the situation of force majeure is*

²⁶³ IIL, Draft on "International Responsibility of States, *supra* note 152.

²⁶⁴ Aaron X. Fellmeth and Maurice Horwitz, 'Ad Impossibilia Nemo Tenetur', *Guide to Latin in International Law*, <http://www.oxfordreference.com/view/10.1093/acref/9780195369380.001.0001/acref-9780195369380-e-113>, Last checked 19.01.2015.

²⁶⁵ Sandra Szurek, 'Circumstances Precluding Wrongfulness in the ILC Articles on State Responsibility: Force Majeure', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 475-479 at 475-476; see also: Art. 23 and commentaries 7-8, ARSIWA, *supra* note 8.

²⁶⁶ Sandra Szurek, '[...] Force Majeure', *supra* note 264, at 476-477.

²⁶⁷ *State Responsibility (Continued), Article 31 (Force Majeure) And Article 32 (Fortuitous Event), Draft Articles Submitted by Mr. Ago (A/CN.4/318 And Add. 1-4, 1569th Meeting, ILC Yearbook 1979, vol. I)* 184-187 at 184.

²⁶⁸ Art. 23(1), ARSIWA, *supra* note 8.

*due, either alone or in combination with other factors, to the conduct of the State invoking it; or (b) the State has assumed the risk of that situation occurring*²⁶⁹. Following the formulation it has been held that the force majeure situation has to be irresistible, unpredictable and in some sense external²⁷⁰. These conditions were discussed in the commentaries of ARSIWA in a following way:

‘Material impossibility of performance giving rise to *force majeure* may be due to a natural or physical event (e.g. stress of weather which may divert State aircraft into the territory of another State, earthquakes, floods or drought) or to human intervention (e.g. loss of control over a portion of the State’s territory as a result of an insurrection or devastation of an area by military operations carried out by a third State), or some combination of the two.’²⁷¹

The most notable exceptions, that perhaps cannot be used to meet the standards, are probably economic and political distress – regardless that these might have relevance in case of necessity²⁷². That will be dealt in the upcoming sub-chapters.

Due to mentioned conditions, the argument of force majeure is, as well, very much bound to the exact conditions of any particular incident. The main emphasis has to be material impossibility to foresee the event. Indeed, there ought to be nothing voluntary or even negligence in the creation of the circumstances.²⁷³ For the purpose of AxS incidents the threshold of force majeure argument is not met just by carelessness or mishandling the technical system it contains. Consequently, it is in many cases possible to argue that user should have foreseen the circumstances leading to the international wrongful act, and thus cannot invoke force majeure. This would also include many cases of malfunctioning – regardless of the accidental, unintended or undesired nature of the malfunctioning.²⁷⁴ It is however necessary to address the role of due diligence in both manufacturing (builder) and

²⁶⁹ ARSIWA Art. 23(2), ARSIWA, *supra* note 8.

²⁷⁰ Sandra Szurek, ‘[...] Force Majeure’, *supra* note 264, at 476-477.

²⁷¹ Art. 23 and commentary (3), ARSIWA, *supra* note 8.

²⁷² Sandra Szurek, ‘[...] Force Majeure’, *supra* note 264, at 478-480.

²⁷³ Art. 23 and commentaries (1-3), ARSIWA, *supra* note 8.

²⁷⁴ See e.g. MCDC, ‘Legal analysis’, *supra* note 29, 14-18.

testing (byer) stages, and its possible effect on the allocation of responsibility. The relevance for the analysis of testing is especially important for example in the context of autonomous weapons systems based on the Article 36 of Additional protocol I²⁷⁵. The due diligence is separately dealt later in the thesis.

Regarding the situations of natural phenomena, force majeure is definitely possible argument even if it dismantles the operating pattern of the system. However, it is important that such event has to be irresistible and unforeseen. For example, not all natural phenomena are unforeseen. The operator state has to be ready for regular natural events – which makes the evaluation of appropriate circumstances very case specific.

In the AxS context, the question of human intervention is rather interesting. AxS, as a system based on algorithm(s), is always vulnerable to the hacking and/or otherwise capturing the control of hardware part of the system. Such situations could in some circumstances amount to the force majeure from the perspective of the original user. For example, actions taken by AxS, which are caused by the hacker, could be considered as force majeure situation from the perspective of original user. In addition to possible force majeure, such situation might mean change in allocation of attribution. Also, an imminent threat of losing the control of the whole AxS, might amount to the situation of force majeure – allowing some actions that would otherwise be wrongful.²⁷⁶

To conclude the issue of force majeure, the general argument is that it is hard to invoke in the AxS context. Especially ‘normal’ malfunctioning based internationally wrongful acts do not fulfil the criteria of force majeure. However, there are situations where it could be invoked. These situations are arising from similar issues as the ‘regular’ force majeure arguments – mainly natural events and uncontrolled human behaviour.

2.3.3.5 Distress

As a reason to preclude wrongfulness, distress can be conceptualised to be in between force majeure and necessity. Not surprisingly such proximity of other concepts has meant division

²⁷⁵ Additional protocol I.

²⁷⁶ See chapter 2.3.2. and chapter 2.3.3.4.

between legal scholars and general ambiguity concerning the concept.²⁷⁷ Somewhat peculiar line between on the one hand distress and on the other the force majeure and necessity is clarified in ARSIWA in a following way:

1. The wrongfulness of an act of a State not in conformity with an international obligation of that State is precluded if the author of the act in question has no other reasonable way, in a situation of distress, of saving the author's life or the lives of other persons entrusted to the author's care.
2. Paragraph 1 does not apply if: (a) the situation of distress is due, either alone or in combination with other factors, to the conduct of the State invoking it; or (b) the act in question is likely to create a comparable or greater peril.²⁷⁸

So, the distress differs from force majeure by the capability to preclude wrongfulness of acts that are in fact taken voluntarily, and because of the definition of distress concentrates to particular type of acts of individuals²⁷⁹. Additionally, pursuant the ARSIWA doctrine, distress seems to be more precise than the notion of necessity described in the next chapter. For distress argument, one needs particular a situation of threat to life of the author or others. Still, it would seem that the line between necessity and distress is harder to interpret than the one between distress and force majeure – especially because of the voluntary and active nature of action leading to the distress situation.²⁸⁰

The particular character of the situation of distress might relate to the situations like entry into foreign airspace or seeking refuge in a foreign port without a permit²⁸¹. Yet, it is still plausible that distress could be invoked in the other contexts as well. Already during the drafting process of ARSIWA it was suggested that:

²⁷⁷ Sandra Szurek, 'Circumstances Precluding Wrongfulness in the ILC Articles on State Responsibility: Distress', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010), 481-489 at 481-482. See also e.g. Vaughan Lowe, 'Precluding Wrongfulness or Responsibility: A Plea for Excuses' 10:2 *EJIL* (1999) 405-411.

²⁷⁸ Art. 24(1-2), ARSIWA, *supra* note 8.

²⁷⁹ James Crawford, *State Responsibility*, *supra* note 11, at 301.

²⁸⁰ See e.g. Malcom N. Shaw, *International law*, *supra* note 13, at 796-799.

²⁸¹ Malcom N. Shaw, *International law*, *supra* note 13, at 797.

...certain conventions have extended the applicability of this principle to somewhat different fields, and the *ratio* of the principle itself suggests that it is applicable, if only by analogy, to other comparable cases²⁸².

The ratio of the distress is important also in the context of AxS. Pursuant ARSIWA the threat to life seem to be a precondition for the invoking distress. Hence, mere threat to AxS itself, regardless of whether it includes the use of force or not, would not meet the threshold alone. However, if the possibility to lose AxS would include a threat towards human life, operator's or someone else's, it might preclude a wrongful act committed by AxS. Thusly, one can conclude that acting in distress might in some specific situations be a relevant legal reason for otherwise wrongful act of AxS. But, since AxS itself cannot be in mortal danger, AxS cannot be programmed to use distress as a reason for otherwise wrongful conduct.

2.3.3.6 Necessity

The necessity is one more reason to preclude wrongfulness pursuant ARSIWA²⁸³. According to article 25, a state, or several states, can invoke necessity when it is the only way, in cases when a state is facing grave and imminent peril²⁸⁴, and the act in question does not seriously impair the interests of other states or international community as a whole.²⁸⁵ Additionally, necessity may not be invoked if the obligation in question prohibits it or state invoking it has contributed to the situation²⁸⁶. Hence, necessity, or state of necessity as it has been called previously by the ILC, is as an abstract argument and a result of very subjective decisions which makes it even more complex doctrine of law. The purpose for it to exist is to provide a safeguard against too rigid application of law in situation with conflicting values.²⁸⁷ The notion has been argued, sometimes more successfully than others, in many different

²⁸² Eighth report on State responsibility, *supra* note 257, at 61.

²⁸³ Art. 25, ARSIWA, *supra* note 8.

²⁸⁴ Art. 25(1a-b), ARSIWA, *supra* note 8.

²⁸⁵ Art. 25(1a), ARSIWA, *supra* note 8.

²⁸⁶ Art. 25(2a-b), ARSIWA, *supra* note 8.

²⁸⁷ Sarah Heathcote, 'Circumstances Precluding Wrongfulness in the ILC Articles on State Responsibility: Necessity', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 491-501 at 491.

contexts and cases like the Caroline incident²⁸⁸ of 1837, the Liberian oil tanker Torrey Canyon situation of 1967²⁸⁹, Rainbow Warrior arbitration of 1990²⁹⁰ and Gabčíkovo-Nagymaros Project case of 1997²⁹¹. For these reasons, it has to be concluded that it is valid, yet, rather clearly defined circumstance precluding wrongfulness.

In the context of AxS, the evaluation of legal use of necessity argument remains very complex. It would be clear to say that the situation has to follow grave and imminent peril rule. Whether AxS could be a target of a grave and imminent peril depends on the nature of the system. It might very well be so that without otherwise internationally wrongful action, AxS would suffer, and thusly a state would suffer, such peril. Or that necessity would be used as an argument of anticipatory, or other, action taken by the AxS. Those cases would be highly specific and irregular but not imaginably impossible. Pursuant the cases mentioned previously, a possible framework for the argument of necessity might be for example the prevention of environmental damage. This being said, it is clear that the threshold for the necessity argument is very high. Also, even AxS action taken in the name of necessity cannot breach essential interests of other states or international community. Hence, the precaution and proportionality needs to be always taken into account. Further, if the situation has been caused by the AxS, it is clear that necessity cannot be used as an excuse for the future internationally wrongful behaviour.

2.3.3.7 Compliance with peremptory norms

Compliance with peremptory norm is based on the notion of jus cogens and norm hierarchy of international law²⁹². In the context of dualistic nature of state responsibility, namely the primary and secondary norms, this particular reason to preclude wrongfulness is heavily

²⁸⁸ Anthony Clark Arend, 'International Law and the Preemptive Use of Military Force', *supra* note 231, at 90-92.

²⁸⁹ 'State Responsibility', (ILC Yearbook, 1980, vol. II[2]) 26-63 at 34-39.

²⁹⁰ Rainbow Warrior, *supra* note 165, at 254-255.

²⁹¹ Gabčíkovo-Nagymaros Project, *supra* note 16, at 40-43.

²⁹² Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 3-6; and Michael Akehurst, A Modern Introduction to International Law, *supra* note 74, at 59. See also: Martti Koskenniemi, *From Apology to Utopia*, *supra* note 18, at 307; and Jan Klabbers and Silke Trommer, Peaceful Coexistence, *supra* note 77, 67-93 at 92-93.

related to primary norms in question²⁹³. In the treaty law peremptory norm, or jus cogens, has been the most famously mentioned in the VCLT Article 53. Pursuant that treaty:

‘peremptory norm of general international law is a norm accepted and recognized by the international community of States as a whole as a norm from which no derogation is permitted and which can be modified only by a subsequent norm of general international law having the same character’²⁹⁴.

The VCLT is highly considered to represent customary law due to its wide acceptance and special role in international law²⁹⁵. Indeed, jus cogens, or peremptory norms, can be seen to ‘incorporate the fundamental values of the international community’²⁹⁶. Some examples of these might be prohibition of genocide, slavery, torture and crimes against humanity²⁹⁷. Regardless of these examples, it is clear that an exhaustive list of exact peremptory norms is, perhaps not even possible, but definitely not fruitful to go through for the purpose of the present thesis. It is sufficient to say that peremptory norms are exceptional in their importance and legal weight²⁹⁸. Thusly, in ARSIWA both the ambiguity and significance were incorporated in a following way: ‘*Nothing in this chapter precludes the wrongfulness of any act of a State which is not in conformity with an obligation arising under a peremptory norm of general international law.*’²⁹⁹

There are two particular aspects concerning the invoking of peremptory norms in the context of precluding wrongfulness. First one is the idea that these norms are a shielding against interest larger or more important than individual state interest. This means self-interest is not a reason to follow them. Secondly, states are always to follow them – also being under

²⁹³ Maja Ménard, ‘Circumstances Precluding Wrongfulness in the ILC Articles on State Responsibility: Compliance with Peremptory Norms’, in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 449-453 at 450-451.

²⁹⁴ Art. 53, VCLT, *supra* note 69.

²⁹⁵ See e.g. Malcom N. Shaw, *International Law*, *supra* note 13, at 94.

²⁹⁶ Maja Ménard, ‘[...] Compliance with Peremptory Norms’, *supra* note 292, at 450.

²⁹⁷ See e.g. Maja Ménard, ‘[...] Compliance with Peremptory Norms’, *supra* note 292, at 450.

²⁹⁸ Maja Ménard, ‘[...] Compliance with Peremptory Norms’, *supra* note 292, at 451. See also *Legality of Nuclear Weapons Case*, *supra* note 89, at 257.

²⁹⁹ Art. 26, ARSIWA, *supra* note 8.

coercive action of other states.³⁰⁰ It is thus to say peremptory norms prevail in situations even when there is lack of willingness or outside pressure to act otherwise. Yet, following norm hierarchy is full of political nuances which put the legal norm hierarchy in jeopardy. Despite the obvious challenges, in the present thesis these norms, even though not comprehensively defined, are taken as highest international law doctrine.

In the context of autonomous systems the peremptory norms exist carrying the same importance as in other forms of social conduct of humans. Hence also in AxS context, no reason to preclude wrongfulness can be invoked if peremptory norms would be the ones breached. Indeed, there is no excuse to allow these norms to be breached by the autonomous systems since that would be forbidden for the humans as well. In other words, the importance of these norms ought to be highlighted as a pretext of the AxS context³⁰¹.

2.3.4 Question of *ultra vires* action

The question of ultra vires acts is important part of the doctrine of state responsibility and as such it is something that needs to be addressed. Pursuant ARSIWA the issue is closely linked to state agent analysis. Indeed, this is demonstrated in two following examples:

The conduct of an organ of a State or of a person or entity empowered to exercise elements of the governmental authority shall be considered an act of the State under international law if the organ, person or entity acts in that capacity, even if it exceeds its authority or contravenes instructions.³⁰²

and

It is irrelevant for this purpose that the person concerned may have had ulterior or improper motives or may be abusing public power. Where such a person acts in an apparently official capacity, or under

³⁰⁰ Maja Ménard, '[...] Compliance with Peremptory Norms', *supra* note 292, at 491.

³⁰¹ Antônio Augusto Cançado Trindade, *International Law for Humankind*, *supra* note 67, at 292-310; and Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 27. Compare e.g. Braden R. Allenby, 'Are new technologies undermining the laws of war?' 70(1) *Bulletin of the Atomic Scientists* (2014) 21-31.

³⁰² Art. 7, ARSIWA, *supra* note 8.

colour of authority, the actions in question will be attributable to the State.³⁰³

It is rather clear that even if unit controlling AxS would act ultra vires, the attribution of state responsibility would not change. A state has responsibility to return such unit under control and only failing to do so, after trying it in bona fide, might lift responsibility from the acts of those units³⁰⁴. Indeed, state's responsibility for its own agents is strong.

The matter of agent was discussed in chapter 2.3.2 and the issue of ultra vires will be addressed on that basis. Following the definition of state agent, it is clear that AxS does not embody the legal capacity to act ultra vires as such. Operator, or his superior, does possess such capacity and should they act ultra vires, actions taken by them would be attributable to the state of origin. In those cases state is under an obligation to restore the agents under control – including the technologies they use. Also regardless of the fact that AxS might be able to learn, adapt and/or change their objective from the intended one, under contemporary international law the AxS itself cannot act ultra vires. Such event would simply constitute malfunctioning situation. Also, hacking or hi-jacking situations might change the control of an autonomous system to another agent and thus change or remove responsibility. However, that would not per se constitute ultra vires situation – given that hacking is coming from outside source.

To summarise, it is clear that there need to be preparations made to counter ultra vires situations. Such contingency plans should include prepared protocols to return agents, and the AxS close to or operated by them, into the control of the state in question.

2.3.5 Concerning multiple states and joint action

The joint operations of states are elemental part of modern interaction between states. For the purposes of state responsibility, there are two categories of behaviour. Pursuant ARSIWA:

³⁰³ ARSIWA Art. 4 and commentary (13), ARSIWA, *supra* note 8.

³⁰⁴ See e.g. Art. 7 and commentaries, ARSIWA, *supra* note 8.

A State which aids or assists another State in the commission of an internationally wrongful act by the latter is internationally responsible for doing so if:

- (a) that State does so with knowledge of the circumstances of the internationally wrongful act; and
- (b) the act would be internationally wrongful if committed by that State.³⁰⁵

If the conditions above are met, then the responsibility can be invoked from two different perspectives. These are *'circumstances where the internationally wrongful act is attributable to more than one state and where one State is implicated in the unlawful act of another State'*³⁰⁶. Both of them are worth of separate discussion this context as well. The discussion here concentrates mainly on the secondary norms of state responsibility.

Firstly, states can find themselves as co-authors of internationally wrongful act. It can happen through regular joint action, through a joint organ or by other means such as joint mandate.³⁰⁷ Joint action is a case where states act together in operation, for example military operations, either through-out the operation or in a way where different states contribute to different stages of a single action. It is crucial that, through the regular rules of attribution, the act committed by any state in that particular group contributes to internationally wrongful act attributable to all given that they are performing joint action in larger sense.³⁰⁸ Action through a joint organ, which is not international organization per se, and especially not de jure, as such is attributable to each state that is a stakeholder in that particular joint organ³⁰⁹. The joint mandate may also arise from links that common mandate creates e.g. if *'the agent commits an unlawful act in the execution of its mandate, it will certainly incur the*

³⁰⁵ Art. 16, ARSIWA, *supra* note 8.

³⁰⁶ Christian Dominicé, 'Attribution of Conduct to Multiple States and the Implication of a State in the Act of Another State', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 449-453 at 449. See also *Case Concerning Application of the Convention on the Prevention and Punishment Of The Crime Of Genocide (Bosnia And Herzegovina v. Serbia And Montenegro)* Judgment, ICJ Reports, (2007) 43 at 217.

³⁰⁷ Christian Dominicé, 'Attribution of Conduct to Multiple States [...]', *supra* note 306, at 282-283.

³⁰⁸ Christian Dominicé, 'Attribution of Conduct to Multiple States [...]', *supra* note 306, at 282-283.

³⁰⁹ Arts. 5 and 47, ARSIWA, *supra* note 8. See also Art. 5 commentaries (1,2,3 and 6), and Art 47 commentaries (2-4), ARSIWA, *supra* note 8.

*responsibility for its act, but its principal will also incur responsibility for it*³¹⁰. This would mean that even if an acting agent is one state but the mandate includes other states, the mandate might in some cases impose responsibility those states as well³¹¹.

Secondly there is a possibility to include the action of state (A) as part of illegal actions of state (B) if the action of state (A) is supporting state (B) to commit the international wrongful act. The Court decided in the *The Prevention and Punishment of the Crime of Genocide* case:

The Court sees no reason to make any distinction of substance between “complicity in genocide”, [...] and the “aid or assistance” of a State in the commission of a wrongful act by another State within the meaning of the aforementioned Article 16 [...]. In other words, to ascertain whether the Respondent is responsible for “complicity in genocide” within the meaning of Article III, paragraph (e), which is what the Court now has to do, it must examine whether organs of the respondent State, or persons acting on its instructions or under its direction or effective control, furnished “aid or assistance” in the commission of the genocide in Srebrenica, in a sense not significantly different from that of those concepts in the general law of international responsibility.³¹²

The quotation above shows the possibility of such implicit responsibility based partly on the ARSIWA article – enhanced in that particular context by a treaty obligation as well. Hence, the aiding of other state³¹³ and/or directing or controlling acts of other state³¹⁴ might implicitly spread the responsibility – even if they have not committed the act themselves. For example interstate coercion can be the reason for the joint responsibility of states. Cases of coercion³¹⁵, or relationship of dependence, might implicate either direct or indirect

³¹⁰ Christian Dominicé, ‘Attribution of Conduct to Multiple States [...]’, *supra* note 306, at 282-283, at 283.

³¹¹ *Certain Phosphate Lands in Nauru Case*, *supra* note 225, at 258-259.

³¹² *Case Concerning Application of the Convention on the Prevention and Punishment Of The Crime Of Genocide*, *supra* note 306, at 217.

³¹³ Art. 16, ARSIWA, *supra* note 8.

³¹⁴ Arts. 17-18, ARSIWA, *supra* note 8.

³¹⁵ Art. 18, ARSIWA, *supra* note 8.

responsibility of more powerful state.³¹⁶ However, specific conditions have to be met and for example the representation of another state is not enough to establish relationship of domination. More evident demonstration of power over the other state is required.³¹⁷ To understand the position of the coerced state, the situation might amount to level of force majeure. Hence, it needs to be concluded that if the conditions of article 16, mentioned previously, are met the assisting state is also responsible for the wrongful act but if the conditions of articles 17-18 and the sole responsibility remains with the controlling or coercing state.

The responsibility for different breaches is also one branch of responsibility of multiple states. It is possible that *'act of a State may in circumstances trigger the international responsibility of another State, based on an autonomous or distinct legal obligation'*³¹⁸. An example of this could be failing to mention harmful material, such as mines, to another state even in cases when the state has not planted those particular harmful materials and as such is not responsible for the primary breach of international norm³¹⁹. Similarly, omission may also result in responsibility from the action of other actors if a primary norm dictates so. For example an attack towards diplomatic mission of state A by state B in the territory of state C, might result in situation where states B and C are responsible – B because of the attack and C because of the lack of protection³²⁰.

The relevance of the mentioned state responsibility rules for the AxS are vast. The autonomous systems are very likely to be used in the cases of multiple state contexts. Thusly, all the aspects are relevant to analyse if there are many states involved. Especially it is important to realise a possibility of being co-author of the wrongful act and the possibility to be indirectly responsible if a state affects or assistants the action of the autonomous systems of other state.

³¹⁶ Art 17, ARSIWA, *supra* note 8; and e.g. Christian Dominicé, 'Attribution of Conduct to Multiple States [...]', *supra* note 306, at 284-285.

³¹⁷ Christian Dominicé, 'Attribution of Conduct to Multiple States [...]', *supra* note 306, at 287-288.

³¹⁸ Christian Dominicé, 'Attribution of Conduct to Multiple States [...]', *supra* note 306, at 283-284.

³¹⁹ See also *Corfu Channel*, *supra* note 16, at 4 and e.g. 22.

³²⁰ Christian Dominicé, 'Attribution of Conduct to Multiple States [...]', *supra* note 306, at 284.

2.3.6 Due diligence as part of state responsibility regime

By its nature due diligence obligation is an obligation concerning conduct and not a result as such³²¹. It is a method or classification of conduct that demonstrates the best effort and good faith of the actor in question when trying to obey an obligation or standard³²². It is content- and context-specific in that the due diligence constitutes an applicable requirement only in some particular situations³²³. In the context of ARSIWA, due diligence is related to the primary norms that would constitute internationally wrongful act if not followed – e.g. by an omission of state³²⁴. It is rather clear that acting due diligently cannot be wrongful act itself but a failure to act due diligently might constitute such a situation that amounts to level of omission³²⁵. The ARSIWA commentaries do not take a stand on whether a breach, as it is formulated in the Article 2, is an objective or subjective breach of an obligation regarding the definition of omission. Both are possible – depending on the particular context and applicable obligations. To put it another way, the threshold for norm breach is formed in the context of the particular norm in question. The view is supported by, the ARSIWA commentaries which do conceptualise due diligence obligation as a context specific requirement – not as a standard that is always applicable.³²⁶ It is for these reasons that only rather abstract analysis on general rules of due diligence can be done.

Despite the lack of preciseness, it is fairly clear that the question of due diligence is part of the legal discourse of AxS as well. From the perspective of state responsibility doctrine, three different aspects of due diligence will be discussed in this thesis. These are due diligence responsibility in the context of operating the system; due diligence when a state is either

³²¹ Lindsey Cameron and Vincent Chetail, *Privatizing War*, *supra* note 234, at 226.

³²² See e.g. Robert P. Barnidge, 'The Due Diligence Principle Under International Law', http://www.academia.edu/430200/The_Due_Diligence_Principle_Under_International_Law, 1-65.

³²³ Art. 3 commentary 8; Articles on Prevention of Transboundary Harm, *supra* note 109. Compare for example of such e.g. chapter 2.3.3.7 and peremptory norms.

³²⁴ Art. 2., ARSIWA, *supra* note 8. Also: Lindsey Cameron and Vincent Chetail, *Privatizing War*, *supra* note 234 at 226.

³²⁵ Michel Montjoie, 'The Concept of liability in the Absence of an Internationally Wrongfull Act', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010), 503-513 at 507. Also cases like: *Corfu Channel*, *supra* note 16, and *The Island Of Palmas Case (Or Miangas) (United States of America v. The Netherlands)*, Award Of The Tribunal, RIAA 11 (1925) 831-868.

³²⁶ Art. 2 and commentary (3), ARSIWA, *supra* note 8.

building or buying (testing) autonomous systems; and thirdly due diligence in the framework of behaviour of citizens. The last of these concentrates on failure to prevent certain actions that would constitute state responsibility as well³²⁷. All these three aspects are analysed separately.

For the purposes of the present thesis, state responsibility and the notion of liability are both relevant in this framework. However, the main emphasis in this thesis remains at the core of state responsibility articles of the ILC. Thusly, due diligence obligations ought to be seen as a particular part of the wider notion of responsibility.³²⁸

2.3.6.1 Due diligence responsibility in the context of operating autonomous systems

Due diligence responsibility in the context of operating autonomous systems refers especially to the standards that the operating action of state has to meet. As explained in the previously, due diligence analysis is related to specific situation and primary norms in question. For this reason, the idea in this chapter is to provide the reader understanding about the general due diligence requirements of the operator. The due diligence analogies that will be introduced next are related to the thresholds of transboundary harm together with the principle of prevention and the use of force. By using these two analogies, the aim is to show two different areas of law where due diligence obligations influence the allocation and limits of responsibility – especially in the autonomous systems context.

The first analogy is taken from the international environmental law. To be precise it is the obligation not to cause damage to the environment of other states³²⁹. Arguably the analogy could be used at the least in the context of transboundary harm that has taken place when using autonomous systems.³³⁰ Still, one needs to remember that it might be problematic to apply the analogy to other context even if the analogy seemed logical – and this limitation has been taken into account. In cases of harmful activity, this particular analogy provides different categories for the accepted harmful activity. These categories are especially relevant in situation where the action in general terms is not prohibited by international law.

³²⁷ To see the context e.g. Tal Becker, 'Terrorism and the State', *supra* note 129, at 141-146.

³²⁸ See e.g. Robert P. Barnidge, 'The Due Diligence Principle Under International Law', *supra* note 150, at 9.

³²⁹ Philippe Sands, *Principles of International Environmental Law* (2nd edition, Cambridge University Press: Cambridge, 2003) at 235-249.

³³⁰ Art. 1, Articles on Prevention of Transboundary Harm, *supra* note, 109.

In the ARSIWA framework, the evaluation of harm would be relevant only in the context of a norm breach. To put it another way, from liability perspective, the evaluation of accepted harm takes place regardless of norm breaches.

Concerning the due diligence needed, the ILC argued, very likely reflecting customary law:

“risk of causing significant transboundary harm” includes risks taking the form of a high probability of causing significant transboundary harm and a low probability of causing disastrous transboundary harm³³¹

The State of origin shall take all appropriate measures to prevent significant transboundary harm or at any event to minimize the risk thereof.³³²

Any decision in respect of the authorization of an activity within the scope of the present articles shall, in particular, be based on an assessment of the possible transboundary harm caused by that activity, including any environmental impact assessment.³³³

These articles describe the limits of the acceptable level of risk – even if the action itself is legal. In those situations, the evaluation is based on the combination of risk³³⁴ as a concept of probability and harm as a term of severity for potential damage. This nexus is further explained by the ILC:

“risk of causing significant transboundary harm” refers to the combined effect of the probability of occurrence of an accident and the magnitude of its injurious impact. It is, therefore, the combined effect of “risk” and “harm” which sets the threshold [...] A definition based on the combined effect of “risk” and “harm” is more

³³¹ Art. 2(a) and commentary (1-3), Articles on Prevention of Transboundary Harm, *supra* note 109.

³³² Art. 3, Articles on Prevention of Transboundary Harm, *supra* note 109.

³³³ Art. 7, Articles on Prevention of Transboundary Harm, *supra* note 109.

³³⁴ More on risk analysis see e.g. Ulrich Beck, ‘The Reinvention of Politics’, translated by Leevi Lehto (‘Politiikan uudelleen keksiminen’) (Translated by Leevi Lehto) In Ulrich Beck, Anthony Giddens and Scott Lash, *Reflexive Modernisation. Politics, Tradition and Aesthetic in the Modern Social Order* (trans. *Nykyajan jäljillä: refleksiivinen modernisaatio*). (Gummerus Kirjapaino Oy: Jyväskylä, 1996) at 1-27.

appropriate for these articles, and *the combined effect should reach a level that is deemed significant*. The obligations of prevention imposed on States are thus not only reasonable but also sufficiently limited so as not to impose such obligations in respect of virtually any activity.³³⁵

This nexus of categories provides the threshold and limits for the action that can take place in otherwise legal activity. Vice versa this means that the spectrum of allowed activity can be described as well. Hence, the definition of allowed activity would not include small risks of ultrahazardous or a high probability of significant harm. Yet, allowed would be low probability of even significant transboundary harm.³³⁶

The works of the ILC provide a framework for legal transboundary harm analysis, given that the harm is physical and based on otherwise legal activity³³⁷. Yet, the evaluation of ‘serious consequences’ has been applied for a long time. It was invoked already in the Trail Smelter arbitration³³⁸ and thus it has a long history in international law³³⁹. Together with similar principles, like the precautionary principle³⁴⁰, the principle of prevention is at the core of due diligence obligation. Yet, the style, degree and scope of required preventive measures remain obviously context specific³⁴¹. It is worth underlining that the duty in these articles on prevention of transboundary harm is explicitly based on the environmental law obligation³⁴². Hence, there is good reason to believe that similar due diligence obligation exists in the context of AxS – in the context of environmental law. But, the actual articles also explicitly refer to the ‘physical’ transboundary harm³⁴³. Hence, if there is no other legal doctrine (as *lex specialis*) to apply, there is a good reason to argue that the concept and thresholds of physical transboundary harm would be applicable in other contexts of law as well. Also, there

³³⁵ Art. 2 commentary (2), Articles on Prevention of Transboundary Harm, *supra* note 109.

³³⁶ Art. 2 commentary (3), Articles on Prevention of Transboundary Harm, *supra* note 109.

³³⁷ Art. 1, Articles on Prevention of Transboundary Harm, *supra* note 109.

³³⁸ *Trail Smelter Arbitration (United States, Canada)* 3 RIAA (1941) 1905-1982 at 1965.

³³⁹ E.g. *Case Concerning Pulp Mills On The River Uruguay* (hereinafter *Pulp Mills case*) (*Argentina v. Uruguay*), Judgment, ICJ Reports (2010) 14.

³⁴⁰ See e.g. Philippe Sands, *Principles of International Environmental Law*, *supra* note 329, at 246-249.

³⁴¹ Art. 3, Articles on Prevention of Transboundary Harm, *supra* note 109.

³⁴² Art. 3 commentary (8), Articles on Prevention of Transboundary Harm, *supra* note 109.

³⁴³ Art. 3 commentaries (8-11), Articles on Prevention of Transboundary Harm, *supra* note 109.

is no specific reason why this would not be the case in relation to the autonomous systems as well. To summarise, the prevention principle and different degrees related to it, are relevant in the AxS context as well. The analysis should concentrate on whether situation would amount at the level of significant, or ultrahazardous, activity. This is crucial for the liability issues of autonomous systems.

The second analogy is drawn from the primary norms of the use of force. Following the context of present thesis, the use of force analogy is done in the framework of state responsibility doctrine. In fact, the use of force, as a conduct, is rarely a pure liability issue given that there are so many primary norms regulating the doctrine. Both conventions³⁴⁴ and customary law³⁴⁵ cover this area of law extensively. It is also clear that in this context there are different standards that have to be met, which differ between the norms in question³⁴⁶. For example humanitarian law, and human rights law for that matter, do create tighter obligations, than due diligence obligations, to follow³⁴⁷. Additionally, for example LOAC provides principles that have to be evaluated in the context where they are used – very similar to due diligence conduct³⁴⁸. The change of context would change the level of due diligence needed – for example being under aggression might change due diligence required. Also, in situations when there is a suspicion that proportionality principle in the context of self-defence has been violated, it has to be analysed whether necessary measures had been taken to avoid the wrongful act. The same logic is applicable to the act of omission as well. All of these aspects are applicable to autonomous systems context as well.

Also, there are due diligence analyses within the reasons to preclude wrongfulness. Arguably, these are very much connected to primary norms as well. For example due diligence in the context of proportionality of self-defence is substantively different from due diligence in the context of necessity. Also, in the context of force majeure acting in a due diligent manner

³⁴⁴ E.g. Additional protocol I, *supra* note 86.

³⁴⁵ See e.g. self-defence in chapter 2.3.3.2.

³⁴⁶ See e.g. Lindsey Cameron and Vincent Chetail, *Privatizing War*, *supra* note 234, at 230-273.

³⁴⁷ MCDC, 'Legal analysis', *supra* note 29, 14-18. See also e.g. ICRC, 'International Humanitarian Law and International Human Rights Law Similarities and differences', 1/2003, https://www.icrc.org/eng/assets/files/other/ihl_and_ihrl.pdf, Last checked 11.01.2015.

³⁴⁸ See e.g. chapter 2.3.3.2.

might mean that it goes against “*irresistible force or of an unforeseen event*” -rule³⁴⁹. Can an event be unforeseen if it is already (and due diligently) addressed? This question is almost totally case specific but in most cases the answer would seem to be not. Also, the real life use of AxS is related to issues like best practices – as implicitly referred by the ICJ³⁵⁰.

To conclude the usage of AxS sub-chapter of the due diligence obligations, one has to underline the uniqueness of primary norm situations. The usage of the autonomous systems will be subjected to this analysis. Due diligence analysis is relevant in both state responsibility and liability situations of using autonomous systems – however the premise of the analysis is different. Actually, the usage of AxS is often related to the due diligence obligation – given that there are also more precise and absolute obligations related to using them. Therefore, due diligence analysis will be taken into account in the scenario analysis chapters as well.

2.3.6.2 Due diligence regarding either building and testing or buying and testing autonomous systems

From the perspective of building and testing autonomous systems it is crucial to analyse the type of standards that are in place, related to the type of the autonomous system in question. Basically, the question is whether there is a legal obligation to vigorously test the legality of a system – or is legality presumed through more general features of apparatus. Following, the standard of testing would constitute state responsibility issue, if a state fails to comply with specific requirements regarding building or testing of an autonomous system. If there is no separate regime regarding that particular type of machines, then builder, buyer (tester) is normally responsible or liable for ultimately using the AxS – regardless of the whether they have built it by themselves or bought it from someone else.

Therefore, the clearest examples related to the responsibility of building and testing or buying and testing situations are arising in situations when there exists an explicit reason to do so. The question is therefore primary norm specific and impossible to go through exhaustively for whole autonomous systems discourse. However, as an example, there is a

³⁴⁹ Art 23, ARSIWA, *supra* note 8.

³⁵⁰ Pulp Mills case, *supra* note 339, at 77-79.

specific primary norm in place concerning the testing of new weapon systems. It can be found from widely ratified³⁵¹ Additional Protocol I:

NEW WEAPONS. In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party.³⁵²

The provision is a good example of particular primary norm that imposes certain level of standards for treaty parties. The effect of the Article 36 is on the one hand explicit but on the other hand it could be described to represent the object and purpose of the treaty – specified in the VCLT³⁵³. Thusly, it is clear that contracting parties have a clear reason to obey it in a good faith. Yet, it is not unproblematic to interpret the treaty this way and for example in the context of the ILC jurists could not fully agree on the weight of different treaty interpretations³⁵⁴. Especially in the context of Article 36 it is hard to interpret when the ‘determination’ of legality is fully followed – it is practically impossible to foresee all possible scenarios of applicability and malfunctioning situations. So, even there it has to be a threshold of good practices and due diligence that is enough. Hence, the question of the limits of treaty obligation is indeed intriguing and very case specific. As a general rule, a state needs to consider whether the field of autonomous system is such that there are obligations regarding the harmfulness the system. If so, there is a good reason to believe that building or buying a system is subjected to the principle of not going against the object and purpose interpretation³⁵⁵. It is safer to be aware of treaty obligations and to take them, as vigorously as it is possible, into account the building and buying phases of the system.

³⁵¹ The protocol has 174 ratifications, see: ICRC, ‘Treaties and States Parties to Such Treaties’, <https://www.icrc.org/applic/ihl/ihl.nsf/Treaty.xsp?action=openDocument&documentId=D9E6B6264D7723C3C12563CD002D6CE4>, Last checked 19.01.2015.

³⁵² Art. 36, Additional Protocol I, *supra* note 86.

³⁵³ Arts 18-19 and 31, VCLT, *supra* note 69.

³⁵⁴ Art. 27-28th and commentary 2, *Draft Articles on the Law of Treaties with commentaries* (1966), (ILC Yearbook, 1966, vol. II).

³⁵⁵ Arts 31, VCLT, *supra* note 69.

A situation where there is no prohibited action as such, requires liability analysis. This is also relevant in building or testing context as well. These are usage specific questions in the framework of manufacturing and using (or deployment) of the system. For example, if physical harm takes place, the question of the precautionary principle is then to be discussed³⁵⁶. Indeed, precautionary principle is a clear demonstration of such due diligence threshold in the testing context as well. Since the principle has been applied in different contexts, it is quite clear that there are different interpretations of it. The common elements of precautionary principle(s) are the following: in international context it always refers to transboundary situations; there is a scientific uncertainty at least to a certain degree; uncertainty does not mean automatic blocking of technology but only applying best practices when utilizing the technology; a certain level of potential risk of damage is required; balance of cost regarding precautionary measures and cost of doing nothing have to be evaluated; and the principle may entail shifting the burden of proof to one who is starting the activity³⁵⁷. Following these definitions, the applicability of the principle is unquestionable when it comes to explicit treaty obligations. Whether there exists a customary law principle of precaution remains contested. Some are arguing that such regime is in place due to the usage of the term in various international regimes. For example, the European Court of Human Rights has applied the principle both as treaty obligation and as principle in international law.³⁵⁸ Yet, many seem to challenge the idea based on the ambiguity of the term; disunited and heterogeneous state practice; and lack of e.g. ICJ case law accepting the principle as part of customary law³⁵⁹. Consequently, the precautionary principle has relevance in analysis of state responsibility of autonomous systems. However, only through context specific analysis the actual legal weight of the doctrine can be analysed. It is clear that precaution has to be differentiated from the more solid principle of prevention – difference being harm that the

³⁵⁶ Gerhard Hafner and Isabelle Buffard, 'Obligations of Prevention and Precautionary Principle', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010) 522-534 at 526.

³⁵⁷ Gerhard Hafner and Isabelle Buffard, '[...] Prevention and Precautionary Principle', *supra* note 356, at 528-530.

³⁵⁸ Gerhard Hafner and Isabelle Buffard, '[...] Prevention and Precautionary Principle', *supra* note 356, at 530-532. Also: *Tătar v. Romania*, no. 67021/01, ECHR Judgment (27th January 2009) at paras. 73 and 120.

³⁵⁹ Gerhard Hafner and Isabelle Buffard, '[...] Prevention and Precautionary Principle', *supra* note 356, at 530-532.

prevention principle is preventing is more probable than the scientific risk behind the principle of precaution. The more probable the risk, the clearer it is that it needs to be due diligently dealt.

It is rather clear that the due diligence obligation cannot be used to discriminate other sellers of systems. There are two main rules in international law concerning the treatment of foreigners – or foreign companies. The western idea is that there ought to be minimum standards that every nation ought to respect³⁶⁰. The other option is the national treatment standard held mainly by South American countries³⁶¹. This theory would require foreign companies to be held in the same standard as national companies³⁶². The general rule is then amended by restrictions – e.g. generally speaking national security questions give the right to discriminate while making purchases. This is evident for example in the EU law context.³⁶³ These aspects need to be taken into account when acquiring AxS systems for official purposes. If a system is purchased from an EU country in the context of civilian use, and without any other legal reason to discriminate the seller, the origin of the supplier ought not to be part of evaluation as such. Regarding the most contemporary development, the negotiations concerning The Transatlantic Trade and Investment Partnership (TTIP)³⁶⁴ might additionally affect the sale of autonomous systems. However, given secrecy concerning the negotiations the issue cannot be evaluated as such. In the context of due diligence the fact that a company is foreign cannot as such result in different treatment. However, if AxS are bought for national security purposes there is a legal room for a different type of scrutiny. In this sense autonomous systems do not seem to have technology specific characters.

³⁶⁰ Malcom N. Shaw, *International Law*, *supra* note 13, at 824; and Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 525.

³⁶¹ Malcom N. Shaw, *International Law*, *supra* note 13, 824-825; and Ian Brownlie, *Principles of Public International Law*, *supra* note 20, at 524.

³⁶² Malcom N. Shaw, *International Law*, *supra* note 13, 824-827. See also e.g. United Nations Conference On Trade And Development (hereinafter UNCTAD) *National Treatment*, UNCTAD/ITE/IIT/11 (Vol. IV, United Nations: New York, 1999) 1-84.

³⁶³ Arts. 34-37, Consolidated Version Of The Treaty On The Functioning Of The European Union (hereinafter TFEU), Official Journal of the European Union, C 326/47, 13th of December, in force 1st of December.

³⁶⁴ See e.g. European Commission, 'Trade: In focus: The Transatlantic Trade and Investment Partnership – Making trade work for you', <http://ec.europa.eu/trade/policy/in-focus/ttip/>, Last checked 11.01.2015.

Regarding general analysis, the state responsibility doctrine relates to the process and the best practices required from the builder or from the buyer when testing the autonomous system. Due diligence is a method that represents primary norm obligation. In cases like weapon systems, where there is a ban of developing some particular features pursuant the Article 36³⁶⁵, there are no excuses if the testing part of the process does not meet the most relevant standards. In this situation negligence in testing would constitute an internationally wrongful act. In cases where there is no such provision general answer cannot be given. The question can be answered only case specifically.

2.3.6.3 Behaviour of private individuals in state responsibility doctrine and in the context of due diligence

Pursuant the main rules a state should not be held responsible for the actions of private individuals. This rule also includes individuals who though possessing the status of state agent, do not act in that capacity at the time of action – yet acting *ultra vires* does not constitute such private action. However, it is clear that the distinction between official and unofficial capacities must be made in the context of action. General doctrine concerning the acts of individuals has been the acknowledged by scholars and is arguably the position of contemporary state responsibility system.³⁶⁶ Yet, there are two types of situations when the actions of individuals become an issue of state responsibility. The first category is formed of the situations that might seem, *a priori*, to be attributable to individuals but end up to become state activity. The second category comprises from situations where state responsibility is based on the catalytic action of an individual. In the latter category, the act of an individual is not the basis for state responsibility as such but the state responsibility arises from a separate wrongful act of state.³⁶⁷ Following the ILC's formulation, it is relevant to understand that:

³⁶⁵ Additional Protocol I, *supra* note 86,

³⁶⁶ Olivier de Frouville, 'Attribution of Conduct to the State: Private Individuals', in James Crawford, Alain Pellet and Simon Olleson (Eds.) and Kate Parlett (Ass. Ed.) *The Law of International Responsibility* (Oxford University Press: Oxford, 2010), 257-280 at 257-264. See also: Art. 4 and commentaries 1-13 and Arts. 7-8, ARSIWA, *supra* note 8.

³⁶⁷ Olivier de Frouville, 'Attribution [...] Private Individuals', *supra* note 365, at 257-261. See also Art 4 and commentary 2, ARSIWA, *supra* note 8.

The attribution of conduct to the State as a subject of international law is based on criteria determined by international law and not on the mere recognition of a link of factual causality. As a normative operation, attribution must be clearly distinguished from the characterization of conduct as internationally wrongful.³⁶⁸

Pursuant the formulation, the attribution to a state has to be based on an international law norm – not seeming logical causality of events. Thusly, from the perspective of state responsibility doctrine, the question of state responsibility and actions of individuals has to be understood as secondary norms. Yet, when examining the catalytic side of the behaviour of individuals, the notion does not exclude possibility that there are primary norms making actions of individuals as an issue of state's responsibility. This is arguably different than main doctrine of state responsibility, and very much an issue of due diligence as well. Hence, it is justified to analyse the issue in the present chapter.

The first category of a priori attribution is based on articles 5, 6, 8, 9 and 11 of ARSIWA³⁶⁹. Typical for the reasons mentioned in the articles are either by the type of recognition by a state³⁷⁰ or de facto (or fonctionnaire de fait) control of actions of individuals³⁷¹. Regarding the de facto option, it is clear that the exact interpretation is complex. At the very least two interpretations of the threshold of attribution: one view argues for the complete dependence of private actors (on state) and the other effective control of state over the private actors.³⁷² There is no attempt to solve this ambiguity in the present thesis but it is sufficient that both views are noticed at this point. The use of public power in the absence of default state authority is based on three, rather equivocal, criterions that have to be met in order for the attribution to exist:

first, the conduct must effectively relate to the exercise of elements of the governmental authority, secondly, the conduct must have

³⁶⁸ Chapter II commentary 4, ARSIWA, *supra* note 8.

³⁶⁹ ARSIWA, *supra* note 8. See also: Olivier de Frouville, 'Attribution [...] Private Individuals', *supra* note 365, at 264-275.

³⁷⁰ Arts. 6 and 11, ARSIWA, *supra* note 8.

³⁷¹ Arts. 5, 8 and 9, ARSIWA, *supra* note 8. See also: See also Olivier de Frouville, 'Attribution [...] Private Individuals', *supra* note 365, at 265-275.

³⁷² Olivier de Frouville, 'Attribution [...] Private Individuals', *supra* note 365, at 266-271.

been carried out in the absence or default of the official authorities, and thirdly, the circumstances must have been such as to call for the exercise of those elements of authority.³⁷³

Hence, even the lack of default state authority does not mean that actions might not be attributable to any state. Following, in the cases of articles 8 and 9 the attribution to the state arises from the certain facts regarding the situation – not the legal institutional link. In other words, the action committed by the individuals constitutes action that is attributable to the state on the factual level of action not on an institutional level.³⁷⁴ Regarding a posteriori endorsement of an act, mentioned previously, it is possible to link acts committed by individuals to state, if ‘...*State acknowledges and adopts the conduct in question as its own*’³⁷⁵. The rule remains complex both in sense of act and omission. If an action is explicitly considered by a state as its own, there is a question whether the rule would apply. Yet, one may imagine a situation where: firstly, a wrongful action itself would not be conducted by a state but by private individuals (de facto and de jure); secondly, the state would bear primary norm responsibility to try to end the breach; and thirdly, the state still would endorse the act. This type of situation might be attributable since endorsement would reflect larger tolerance and a deeper connection towards the act – especially from the omission perspective.³⁷⁶ The ICJ supported this type of view in its judgment as well³⁷⁷. Hence, it ought to be concluded that the endorsement of actions of civilians might build the legal threshold for wrongful act.

From the autonomous systems perspective, the actions of individuals can easily become state activity as well. This is most evident in a situation when a state explicitly acknowledges individuals using, or otherwise acting together with AxS, as state action. In these situations, states will probably be quite diligent regarding the actions they are willing to consider as their own – in order to avoid the possibility for internationally wrongful acts. Secondly, unacknowledged actions of individuals might become relevant to states in the AxS context

³⁷³ Art. 9 commentary 3, ARSIWA, *supra* note 8.

³⁷⁴ Olivier de Frouville, ‘Attribution [...] Private Individuals’, *supra* note 365, at 265.

³⁷⁵ Art. 11, ARSIWA, *supra* note 8.

³⁷⁶ Olivier de Frouville, ‘Attribution [...] Private Individuals’, *supra* note 365, at 273-275.

³⁷⁷ *United States Diplomatic and Consular Staff in Tehran*, *supra* note 16, at 35-37.

as well. In these cases, the action that individuals commit themselves through AxS become such that states, by implicitly endorsing it, invoke state responsibility doctrine. These situations could easily be imagined in the autonomous systems context. But, similarly, there is an assumption that states will rather carefully evaluate whether to give such implicit endorsement to actions – this is a highly political decision which still might have international law consequences.

The second category of links between the state responsibility and action of individuals is the catalysis aspect. It is based on the different logic than previously discussed categories. The idea of catalysis responsibility is derived from the notion of complicit responsibility of a state for the actions of private individuals. For these reasons, the idea of catalysis is criticized since complicit theory implies the rejection of a dualistic model of law – where individuals are bound by domestic laws and states by international law. On the surface this claim seems reasonable. Still, some factors have made the catalysis argument a relevant part of state responsibility regime as well.³⁷⁸

Indeed, there are a couple of problems in renouncing the catalysis effect. For example the contemporary international law encompasses norms which invoke obligations both to state and individual. In these situations it is reasonable to see an apparent nexus between state responsibility and acts of individuals. A state does not make itself an accomplice to the action of individual but the action of individual makes the matter a state obligation issue.³⁷⁹ Indeed, the obligation of controlling individuals is related, in a due diligence manner, to the effective control of state over its territory³⁸⁰. The threshold for it is rather important. The control of state's territory does not have to be absolute but as the ICJ put in the Corfu Channel case:

But it cannot be concluded from the mere fact of the control exercised by a State over its territory and waters that that State necessarily knew, or ought to have known, of any unlawful act perpetrated therein, nor yet that it necessarily knew, or should have

³⁷⁸ Olivier de Frouville, 'Attribution [...] Private Individuals', *supra* note 365, at 275-277.

³⁷⁹ Olivier de Frouville, 'Attribution [...] Private Individuals', *supra* note 365, at 277. See also: *Case Concerning Application Of The Convention On The Prevention and Punishment Of The Crime Of Genocide*, *supra* note 306, at 176-178.

³⁸⁰ Lindsey Cameron and Vincent Chetail, *Privatizing War*, *supra* note 234, at 226-228.

known, the authors. This fact, by itself and apart from other circumstances, neither involves prima facie responsibility nor shifts the burden of proof³⁸¹.

Hence, it is clear that states do not have to monitor everything. The threshold seems to be that a state has to take all reasonably expected measures to avoid the situation. This obligation is very much primary norm specific and consequently state responsibility for the acts of individuals is not automatically invoked – even when there is lack of effort on behalf of a state. For example the treaty obligation arising from the 1907 Hague convention explains threshold for due diligence action in one particular context:³⁸²

Art. 4. Corps of combatants cannot be formed nor recruiting agencies opened on the territory of a neutral Power to assist the belligerents.
[...] Art. 6. The responsibility of a neutral Power is not engaged by the fact of persons crossing the frontier separately to offer their services to one of the belligerents.³⁸³

In the quotations above, the level of due diligence that is required from a treaty party is limited to stop recruiting agencies – not to stop individuals from leaving. This is a good illustration of type of behaviour that has to be analysed in every situation separately. In the context of autonomous systems it is very much domain and system specific what type of norms are related to using of AxS by individuals. What is clear, though, is that this obligation is there because of the obligations based on the primary norms. In the drafting process of ARSIWA catalysis idea was rejected from the state responsibility articles themselves and the catalysis that we have nowadays is legal regime specific.³⁸⁴

Still, the argument based on the catalysis effect remains ambiguous for autonomous systems context. There is a possibility to invoke this argument. However, it has to be done context specifically. For example autonomous weapon systems are weapon systems as any other, and actions of individuals will constitute international, and possibly internationally wrongful

³⁸¹ *Corfu Channel*, *supra* note 16, at 18.

³⁸² Lindsey Cameron and Vincent Chetail, *Privatizing War*, at 228.

³⁸³ Arts. 4 and 6, Convention (V) respecting the Rights and Duties of Neutral Powers and Persons in Case of War on Land (hereinafter Hague Convention V). The Hague 18th October 1907, in force 26.01.1910.

³⁸⁴ See chapters 2.2.2 and 2.2.3.

acts, of states if primary norms so govern. As a concrete example, states would probably bear responsibility for the acts of individuals if they are sending autonomous weapon systems (with their operators) to other countries. If such recruiting office exists, the state would probably bear responsibility to interfere to the recruiting or it would commit an internationally wrongful act. Hence, individuals can act as catalysis for state responsibility. However, these situations are similar to other contexts of social life. The new aspects that autonomous systems are creating are thus rather few.

2.3.7 Acts not prohibited by international law in the context of state responsibility

In addition to state responsibility regime there is a notion of liability in the situations of acts not prohibited by international law. There is some ambiguity concerning the term since the phenomenon called liability in English is in some other UN languages the same as for the word responsibility – e.g. *responsabilité* and *responsabilidad*³⁸⁵. In legal Finnish language the words have similarities though are different – responsibility is *syntakeisuus* or *vastuunalaisuus* and liability is *tuottamusvastuu*³⁸⁶. But as evident, in English the distinction between the terms has been made explicitly. Perhaps there is a good reason to make this distinction since pursuant ARSIWA in the absence of internationally wrongful act state responsibility cannot be invoked, however, a state might be liable for some harm done without a breach of specific obligation³⁸⁷. The notion has been called by many names but they all include the core idea of liability without internationally wrongful act as such. For the purpose of this thesis, this phenomenon is called objective liability and it is used as a supplementary set of rules towards state responsibility doctrine.³⁸⁸

It needs to be underlined that there is persuasive argument implying that the regime of objective liability is not fully established as applicable international law regime. It might be accepted as a concept on the domestic legislation level but contemporary it lacks the full applicability of international legal regime. It has been argued that these rules have some

³⁸⁵ James Crawford, Alain Pellet and Simon Olleson (Eds.) *The Law of International Responsibility*, at v-vii.

³⁸⁶ MOT Dictionary, <https://mot.kielikone.fi/mot/hy/netmot.exe?motportal=80>, Last checked 19.01.2015.

³⁸⁷ See e.g. Art. 1 commentary (6), Articles on Prevention of Transboundary Harm, *supra* note 109.

³⁸⁸ Michel Montjoie, 'The Concept of liability [...]', *supra* note 324, at 504; and Malcolm N. Shaw, *International Law*, *supra* note 13, at 856-862.

characteristics of recommendation (or soft law), however it is definitely not totally negligible.³⁸⁹ Problematic issues include for example: the influence and relationship towards responsibility regime as a separate regime of law; differing and incomparable state practise; rise of specific legal regimes prohibiting certain hazardous activities; and the incoherent scope of applicability of the doctrine³⁹⁰. Taking into account these substantial challenges in the legal applicability of objective liability, there still remain good reasons to go through some specifics of the notion.

In the context of present thesis, the doctrine of objective liability is a supplement to the state responsibility doctrine. There is a reason to identify intersections between state responsibility and objective liability, and further to explore the role of due diligence within that nexus. So, the thesis concentrates on the doctrine of state responsibility, yet, objective liability will be used as a tool to frame the limits of the state responsibility doctrine.

The purpose of the objective liability is to provide a mechanism of compensation for situations where victims have suffered from action that is not prohibited. It is therefore damage or injury that is crucial in the context of liability³⁹¹. This is contrary to the premise of the ILC state responsibility doctrine where the crucial factor is internationally wrongful act – not necessarily damage as such³⁹². Yet, in both contexts the remedy and compensation are crucial for the real life impacts of the doctrines. In the present thesis, the allocation of such remedies has been excluded. The ILC formulated the core of liability in a following way:

Contrary to State responsibility, international liability rules were primary rules, for they established an obligation and came into play not when the obligation had been violated, but when the condition that triggered that same obligation had arisen. [...] Under the present topic, on the other hand, the harmful event, while perhaps being a foreseeable event, did not constitute a breach of an obligation. [...]

³⁸⁹ Michel Montjoie, 'The Concept of liability [...]', *supra* note 324, at 512. See also ILC, 'International liability in case of loss from transboundary harm arising out of hazardous activities', http://legal.un.org/ilc/summaries/9_10.htm, Last checked 11.01.2015.

³⁹⁰ Michel Montjoie, 'The Concept of liability [...]', *supra* note 324, at 507-508.

³⁹¹ Michel Montjoie, 'The Concept of liability [...]', *supra* note 324, at 505-508.

³⁹² See chapters 2.2.2. and 2.2.3. Also: e.g. *Report of the International Law Commission on the work of its thirty-ninth session*, (A/CN.4/SER.A/1987/Add.1, ILC Yearbook 1987, vol. II[2]), 1-62 at 43.

In the view of these members, however, under the regime of the present topic the State liable would have to compensate as a general rule. [...] The rules of attribution were also different under the two topics. In the case of liability without a wrongful act, the place where the activity was carried on determined the State that was in principle liable. In the case of responsibility for a wrongful act, that criterion was, on the contrary, inadequate.³⁹³

Following the reasoning of majority of the ILC members, the liability is a separate legal notion from state responsibility. The objective liability seems to be related only to physical harm – not for example commercial or financial one³⁹⁴. Accordingly, within physical harm there are types of activities that might lead to objective liability. These activities have to be evaluated through the risk based evaluation of accidents (hazardous) and collateral effects (harmful activities) – especially in the environmental law context. The first one is related to the consequence that is both unintended and to certain extent unanticipated – at the very least the aim of the activity has not been this outcome³⁹⁵. The unwanted effects are based on the concept of gradual harm where the threshold of liability is rather ambiguous³⁹⁶. The best clarification seems to be the concept of significant harm³⁹⁷ that then shapes the threshold for acceptable conduct – more significant harm is probable to take place, more due

³⁹³ *Report of the International Law Commission on the work of its thirty-ninth session*, *supra* note 392, at 43.

³⁹⁴ Michel Montjoie, 'The Concept of liability [...]', *supra* note 324, at 505; and *Report of the International Law Commission on the work of its thirty-ninth session*, *supra* note 392, at 43.

³⁹⁵ Michel Montjoie, 'The Concept of liability [...]', *supra* note 324, at 506; and Philippe Sands, *Principles of International Environmental Law*, *supra* note 329, at 246-249. Compare: Jacqueline Peel, *Science and Risk Regulation in International Law* (Cambridge University Press: Cambridge, 2010) at 88-110.

³⁹⁶ See e.g. *Island of Palmas Case (Or Miangas)*, *supra* note 325; *Trail Smelter*, *supra* note 338; *Corfu Channel*, *supra* note 16; and *Lake Lanoux Arbitration (France v. Spain)* 12 RIAA (1957) 281; 24 ILR. 101, 1-36. See also: Michel Montjoie, 'The Concept of liability [...]', *supra* note 324, at 506-509.

³⁹⁷ *Corfu Channel*, *supra* note 16; Art. 1-2 and their commentaries, Articles on Prevention of Transboundary Harm, *supra* note 109; and Convention on the Law of the Non-navigational Uses of International Watercourses, 1997, UNGA 21st May 1997, in force 17th August 2014. See also Art. 7, Law of Non-Navigational Uses of International Watercourses, GA Res. 51/229, 8th of July 1997; and Chinthaka Mendis, 'Sovereignty vs. trans-boundary environmental harm: The evolving International law obligations and the Sethusamuduram Ship Channel Project' United Nations / Nippon Foundation Fellow (2006) http://www.un.org/depts/los/nippon/unff_programme_home/fellows_pages/fellows_papers/mendis_06_07_sri_lanka.pdf. Last checked 11.01.2015, 1-70 at 11-12.

diligence³⁹⁸ is required to prevent it. From point of view of these effects, the principle of prevention and due diligence are crucial.

The objective liability is differently attributable to state than state responsibility doctrine. The later required a person or entity that forms the attribution³⁹⁹. In the context of liability, however, the condition for attribution is based on territorial jurisdiction of that particular area where harmful action is taking place. Although if one loses territorial jurisdiction but remains to occupy it, state responsibility and liability responsibilities remain accompanied with the physical control of a territory⁴⁰⁰. The problem is that action within jurisdiction controlled by states is in many times taken by individuals and other non-governmental actors. This part of the question remains very controversial, and for example it seems to be unanswered “*whether one could attribute to the State an activity liable to cause technological or industrial harms simply because these harms would be catastrophic?*”⁴⁰¹ So, it is clear that the weaknesses of liability regime remain relevant in the context of attribution as well. Indeed, attribution seems to be rather context specific issue in that some actions are rising to (state) responsibility level and some remain for the liability of the operator level.

The principle of prevention has relevance from the perspective of liability, however, the ILC treats these as separate entities⁴⁰². The principle of prevention has been developed in the context of environmental law but it arguably has customary relevance in other sectors of law as well⁴⁰³. It is a legal principle that has significance both in the context of state responsibility and liability – though the meaning differs between the two. The main difference is related to the breach of an obligation. In cases when the prevention principle is an international norm and has not been followed, the breach of obligation means that the issue falls under the doctrine of state responsibility. The wrongfulness of not following preventive principle changes the applicable doctrine of law. In those cases prevention principle is part of the

³⁹⁸ See more on the concept in chapter 2.3.6.

³⁹⁹ See chapter 2.3.2.

⁴⁰⁰ *Legal Consequences for States of the Continued Presence of South Africa in Namibia (South West Africa) notwithstanding Security Council Resolution 276 (1970)*, Advisory Opinion, ICJ Reports (1971) 16 at 54.

⁴⁰¹ Michel Montjoie, ‘The Concept of liability [...]’, *supra* note 324, at 510.

⁴⁰² ILC, ‘International liability in case of loss from transboundary harm arising out of hazardous activities’, *supra* note 389, Last checked 5.11.2014.

⁴⁰³ Philippe Sands, *Principles of International Environmental Law*, *supra* note 329, at 246-249; and Michel Montjoie, ‘The Concept of liability [...]’, *supra* note 324, at 511.

normal customary law. The treaty regime does not, however, fully contribute the liability regime since liability might arise from non-prohibited action and it also includes the notion of reparation – to which many treaties stay silent. Thus, in those cases the principle of prevention is even more ambiguous.⁴⁰⁴

There is some ambiguity whether the obligation of prevention is primary or secondary norm since on the one hand it is an obligation regulating the result and on the other hand obligates to the certain positive action of prevention⁴⁰⁵. In the context of state responsibility the prevention principle seems to have secondary norm qualities⁴⁰⁶ – for example in the Article 14(3)⁴⁰⁷. This is very a due diligence obligation⁴⁰⁸.

In the framework of liability, the principle of prevention is very much an issue of primary norms the setting conditions of conduct. In these cases a breach of obligation of conduct may take place without material damage to the surrounding world – this is particularly so in the case of environmental law.⁴⁰⁹ In other words, it is possible to breach the principle of prevention without causing for example environmental damage as such. The major problem with the principle of prevention in this context is that perhaps the most relevant legal document, the ILC's Articles on Prevention of Transboundary Harm, sets the strict limitation to its applicability. These are the transboundary requirement and the requirement that a breach has to be related to hazardous activities or substances that are otherwise not prohibited by international law but still containing the risk of physical damage⁴¹⁰. Hence, the applicability of this type of argument is rather limited – though not irrelevant.

From the perspective of autonomous systems, the notion of liability is very important. It forms a counterpart to the state responsibility doctrine, and thus it needs to be opened in

⁴⁰⁴ Michel Montjoie, 'The Concept of liability [...]', *supra* note 324, at 508-512; and Philippe Sands, *Principles of International Environmental Law*, *supra* note 329, at 246-249.

⁴⁰⁵ Gerhard Hafner and Isabelle Buffard, '[...] Prevention and Precautionary Principle', *supra* note 356, at 522-523. See also e.g. Convention on International Liability for Damage Caused by Space Objects, General Assembly in 1971, resolution 2777 [XXVI] in 1971, into force September 1972, at 11-18.

⁴⁰⁶ Gerhard Hafner and Isabelle Buffard, '[...] Prevention and Precautionary Principle', *supra* note 356, at 522-523.

⁴⁰⁷ Art. 14(3), ARSIWA, *supra* note 8.

⁴⁰⁸ Gerhard Hafner and Isabelle Buffard, '[...] Prevention and Precautionary Principle', *supra* note 356, at 523.

⁴⁰⁹ Gerhard Hafner and Isabelle Buffard, '[...] Prevention and Precautionary Principle', *supra* note 356, at 523-524.

⁴¹⁰ Art. 1, Articles on Prevention of Transboundary Harm, *supra* note 109; and see also Gerhard Hafner and Isabelle Buffard, '[...] Prevention and Precautionary Principle', *supra* note 356, at 524.

the present thesis as well. Autonomous systems will not conduct internationally wrongful acts for the most of the time and thus the state responsibility regime is relevant only as guiding legal doctrine for cases of illegal situations. Yet, 'normal' and legal conduct of autonomous systems is the most likely subjected to a certain degree of liability. How that liability is then allocated, and to what degree that allocation goes, cannot be fully discussed in the present thesis.

3 Testing the notion of state responsibility

This chapter is the scenario case analysis of the thesis. The scenarios are constructed to contain particular features that are realistically imagined to represent future autonomous systems. These scenarios can be found from the annexes of the thesis. The methodology for choosing these features is following.

Firstly, two scenarios are made to represent the opposite sides of the issue as far as possible. They are constructed to consist of chosen dichotomies where each of them represent the selected features of the system. These dichotomies are divided into five different categories: the background and manufacturing; the testing; the usage of the system; nature of the norm breach; and the timeline and duration of the usage. Within these categories there are twenty-three dichotomies – one side of the dichotomy can be found from scenario one and the other from scenario two. The dichotomies are selected to represent as extensively as possible the relevant issues related to the autonomous system. For example in the scenario one, the machine is made in a foreign country (from the point of view of the user) and in the scenario two the country of origin is the same as the user country.⁴¹¹ Further, these features are selected to represent those issues that might have the biggest potential to be problematic from responsibility perspective. Secondly, the methodological premise is that the scenarios, and dichotomies within them, are written to describe premises and events. These descriptions are not written as a narrative but as a general representation of aspects important from the state responsibility perspective. Following, it is necessary to understand that all the dichotomies have to be considered forming the description of the event as a whole. Hence, the reading guide for the scenarios is that columns should be read as whole – one column represent all relevant issues related to the topic of the column. Thirdly, methodologically speaking, the chosen dichotomies are ultimately based on the subjective decision. There might be other features to be studied as well but these particular dichotomies were chosen because, from subjective perspective, they were the best to conceptualise problematic issues of autonomous systems. Fourthly, the analysis concentrates on international law and not to obvious political realities related to autonomous systems. Fifthly,

⁴¹¹ See Annexes 1 and 2.

there is a genuine attempt to make these scenarios as sweeping as possible. Obviously, the aim is to be able to generalise the findings as much as possible. However, one cannot emphasise enough that in real life situations small details do matter and might settle the case differently. Lastly, the concentration of the analysis follows the same framing and restrictions than the present thesis in general⁴¹².

The style in the following sub-chapters is chosen to address the relevant issues. The scenarios themselves are not repeated but they can be read from the annexes⁴¹³. Hence, the text in these sub-chapters will only give the interpretations of the general rules that have been explained previously in the thesis.

3.1 Manufacturing issues related to autonomous systems

In this sub-chapter, the manufacturing issues of the scenarios are dealt. The purpose of this analysis is to discuss the role and limits of state responsibility from the perspective of a manufacturer. In this context liability doctrine shows the limits of the state responsibility doctrine. The material allocation of liability is not the aim of the thesis. Related to chapter 3.1 especially relevant facts of the scenarios are from the background and building column and the testing column⁴¹⁴.

3.1.1 Scenario one

In the scenario one, the internationally wrongful act has happened. Hence, the examination will concentrate on the fact whether a manufacturer state bears responsibility for it. The norm breach is related to the use of force and therefore the relevant primary norms can be found from that context. The role of manufacturer is from general state responsibility perspective rather small. Arguably, a manufacturer is not automatically attributable to a user state if the system is bought from a foreign country. It would mean that pursuant state responsibility doctrine this would settle the matter.

Yet, the question remains whether the manufacturer, and a seller of the system, would constitute any type of joint action – namely perhaps the assistance of wrongful act. The

⁴¹² See chapter 1

⁴¹³ Annexes 1 and 2.

⁴¹⁴ Annexes 1 and 2.

threshold here is whether the manufacturing state would actually sell the system with the knowledge of possible wrongful act. Since the situation in the scenario seems to be based on malfunction, it is hard to argue that manufacturing state would actually commit the act consciously. Hence, a manufacturer is probably not a co-author of the act.

As a separate notion, primary norms might provide responsibilities for the manufacturer. In the context of scenario one, it is clear to say that state bears responsibility for manufacturing of weapons in their country – given that they are a party to the Additional protocol I⁴¹⁵. This would include weapons manufactured by private companies. Thusly, if the malfunction that has taken place in the scenario is proven to be such that it will rise to the level of illegal weapon, the state would separately be responsible for the manufacturing of the weapon. It is important to realise that this would be separate responsibility from the actual wrongful act taking place in the scenario. Nevertheless, because of the primary norm, wrongful conduct of the manufacturing state would invoke responsibility.

It is also rather obvious that user state has a contractual relationship towards the manufacturer. In the context of scenario one certain elements have been ordered by the user state and the seller (state) has been bound by contract to deliver them. This depends on the detailed requirements laid down by the buyer/user. Such an issue would be subordinate to any trade regime rules that the states might be involved. Hence, it would be a trade dispute related to not fulfilling the contract. However, a user state might be compelled to argue that a breach of contract, together would form material impossibility to fulfil user state obligations to give absolute guarantees of the autonomous system.

Liability regime issues, in the context of international law, are relevant if damage has happened but there is no internationally wrongful act. Regarding the manufacturer's role in the scenario one, the wrongful act has happened. Similarly, the possible primary norm breach would constitute an internationally wrongful act. Additionally, given that the doctrine is still precarious, it might be difficult to argue manufacturer's liability without contractual obligation. If there would be such contractual obligation, it would settle the issue. However,

⁴¹⁵ Especially in the context of Article 36.

in the context of scenario one, the liability doctrine as it is in the contemporary international law would probably not be applicable.

3.1.2 Scenario two

In the scenario two, the operator state is also the builder state. Pursuant the main rules of state responsibility, attribution arises from a group of people acting in capacity of state. Since, in the scenario two there is only one state occupying both positions (operator and manufacturer) it is rather clear that the state's possible responsibility or liability is not changed because of the manufacturing issues. However, similar obligation pursuant the Article 36 of the Additional Protocol I are in place⁴¹⁶. Since there is no difference as such, it is not relevant to do the same analysis again.

3.2 Testing autonomous systems – from byers perspective

Testing of the system is closely linked to the manufacturer and usage of the system. The purpose of the tester is to make sure that the system fulfils all the legal requirements. From responsibility perspective, the question is, whether the testing affects the allocation of state responsibility in international law. Obviously, domestic legal systems are not considered in this analysis. In the context of the present chapter, especially relevant facts of the scenarios can be found from the background and building column and the testing column of the scenarios⁴¹⁷.

3.2.1 Scenario one

The state responsibility doctrine does not directly address testing as an action. The attribution to state is based on the status of the actor – not to the assumption she or he are concerning the workability of an equipment or an apparatus they are using. Hence, pursuant the main rule of state responsibility, and regardless of the fact that testing has been rather vigorous in the scenario one, the responsibility of the act is in accordance of the main rule.

⁴¹⁶ See chapter 3.1.1.

⁴¹⁷ Annexes 1 and 2.

In scenario one, it is clear that there are testing responsibilities arising from the primary rules of international law. The Article 36 of the Additional Protocol⁴¹⁸ imposes such obligations that can be met only through testing. This is similar obligation as it is imposed on a manufacturer⁴¹⁹. Hence, the testing of the system is compulsory, and negligence of testing, might lead to new internationally wrongful acts.

Additionally, in the context of scenario one, the aspect that might change the situation is force majeure as a circumstance to preclude wrongfulness. For example self-defence and necessity would not be applicable in the situation of the scenario. As a reminder, a force majeure needed three conditions: *'(a) the act in question must be brought about by an irresistible force or an unforeseen event; (b) which is beyond the control of the State concerned; and (c) which makes it materially impossible in the circumstances to perform the obligation.'*⁴²⁰ Also, as it has been shown previously, a state cannot contribute to the situation of force majeure. The vigorousness of the testing might have a connection towards the unforeseen part of the force majeure requirement. Whether malfunctioning, which is something that the tester tries to avoid, is an unforeseen event, is very much matter of interpretation and material possibility of testing. The state party that purchases the autonomous systems in question, might have willingness to argue that the event was unforeseen since it could not have been avoided despite the vigorous testing. Also in the context of reasonable expectation that seller would not have the right to manufacture such weapons⁴²¹, the argument of force majeure becomes even stronger. Additionally it is reasonable to assume that the purchasing contract includes responsibilities to the manufacturer to follow the Article 36 of the Additional Protocol I. Still, such argument would stay vulnerable to criticism and lacks similar precedence in international law. One of the problems is the material impossibility of knowing. If risk is assumed, then force majeure cannot be invoked⁴²². To accept malfunction in cases of vigorous testing as a proof of an unforeseen event is problematic because it would open the scope of precluding wrongfulness

⁴¹⁸ Additional protocol I, *supra* note 86.

⁴¹⁹ See chapter 3.1.1.

⁴²⁰ Art. 23 and commentary 2, ARSIWA, *supra* note 8.

⁴²¹ Art. 36, Additional protocol I, *supra* note 86.

⁴²² Art. 23(2b), ARSIWA, *supra* note 8.

for certain misuse. Additionally, the threshold of vigorousness of testing should then be analysed at a very detail level. Especially in cases when some features are prohibited to test by a seller of AxS, the behaviour of a testing state does not rise to the level of material impossibility. In those situations, the state has accepted not to test something and, thus, affected to the situation which means that testing state cannot later invoke force majeure. Regarding the B and C obligations mentioned above, they might actually be met. Still, the article 23 of ARSIWA has to be read as whole and, hence, testing would be under high scrutiny if it were to be accepted as something having a difference.

Concerning the liability doctrine, the testing in the present scenario one is not that relevant. The norm breach in the present context is clear and so the applicable international law doctrine is state responsibility doctrine. Hence, the testing of the system does not affect the liability issue.

3.2.2 Scenario two

The testing part of the scenario two is very much similar as it is in the case of the manufacturer in chapter 3.1.2. Since, the state is involved in designing and manufacturing of the AxS, the tests are carried out simultaneously with the manufacturing process by the user state. Thusly, there are no reasons related to state responsibility doctrine to differentiate these two positions. However, vigorous testing might be shown as the evidence of prevention (or precautionary) measures if the act of the AxS will be classified as internationally wrongful act. Therefore testing cannot be neglected either.

Given that there is a norm breach, the testing would not probably meet the standards of reason to preclude wrongfulness. Reason for this is that state should have known the risks since it has contributed to all the parts of inventing the AxS – as explained in previous sub-chapter. Here only reason to preclude such wrongfulness would also be force majeure, which is already dealt as well. Although, from testing perspective it is good to remind that it is impossible to test everything imaginable. So, due diligence and best practices of testing have to be analysed in real life situation as well – yet, that is neither possible nor feasible in the present context.

In the context of liability doctrine, the testing of the scenario two might have relevance in cases when the damage to other state is significant but not small or ultra-hazardous –

because of the primary norm in question⁴²³. It can be argued that in the context of scenario two the damage cannot be evaluated as small. So, if the damage remains 'merely' significant, preventive intent is relevant – as a due diligence obligation. Arguably, if a state has tried to minimize the risk, a state would not be liable for it. However, this position is vulnerable to critique as well. If the damage would be considered as ultra-hazardous, the testing would not preclude any wrongfulness or change liability. Nevertheless, even in these cases it might increase the unacceptability if the state would not have made the testing part properly. Ultimately, the liability doctrine, and the thresholds of it, might be complementary in state responsibility doctrine as well when analysing the reparations. However, that analysis is framed out from this thesis.

3.3 Using and deployment of the autonomous systems

Usage and deployment of the autonomous system is the most relevant part of the evaluation of responsibility and liability. It is the part where the attribution is usually established. In this chapter the relevant aspects are introduced from the perspective of the user, and hence the emphasis is solely on the issues mentioned in the scenarios. Related to chapter 3.3 especially relevant facts of the scenarios come from the usage of the system, the nature of the norm breach and the timeline and duration columns⁴²⁴.

3.3.1 Scenario one

The first thing to analyse is the norm breach. There is a good reason to argue that the act in question is internationally wrongful act. The primary norm is related to acceptable use of force and it depends on multiple factors and conditions that cannot be described here. However, it can be assumed that such incident would be against the international law – especially in not a wartime situation. Therefore it is assumed that the applicable doctrine in the scenario one is the state responsibility doctrine. Pursuant the doctrine, the attribution has to be confirmed as well. As a fairly off-the-loop machine, the autonomous system in question is not directly controlled by the operator but still the AxS itself does not form a legal

⁴²³ See Annexes 1 and 2.

⁴²⁴ Annexes 1 and 2.

link to the operating state. It is the status of the operator, and the operation command structure, that form the connection in question. So, the main rule is fulfilled and at least the operator state is responsible for the action.

Concerning the position of other states, there is a good reason to argue co-authority of wrongful act. Especially the operation's leader nation is pretty much automatically involved alongside with the operator nation. Additionally, it is important to remember that AxS is literally speaking a system dependent on the e.g. signal and visual information provided for it by multiple sources. Hence, it is lucrative to argue that purely from the perspective of international law, the states that are providing support for the system are part of the action as well. This is based on the ICJ's view on the supportive role of other actors⁴²⁵. Therefore, these actors supporting the system would also form a link to their states, making these supporting states co-authors of internationally wrongful act.

If the system has been captured by hackers, the system is not operated by the state of origin anymore. Similarly, if hackers change the operation parameters of the system, the link to the state of origin becomes unclear. The original user state could argue that hacking caused a reason to preclude wrongfulness depending on the nature of the hacking. There is a requirement that state cannot contribute to such reason. Hence, there is clear obligation not to provide assistance to the capture of the AxS. Additionally, the obligation would probably include a positive requirement to provide reasonable amount of protection against such hacking – but since no such case has been evaluated by the courts it is hard to evaluate the actual threshold. Lastly, the state would bear responsibility to try to restore the AxS in its control if it wishes to avoid state responsibility.

Regarding the timeline factors, the action taken after the wrongful act has been identified is critical. In the scenario one the state of origin has applied correct protocol and ended the mission. This is in accordance with the ARSIWA doctrine⁴²⁶. Still, the effects of the wrongful act reach long into the future. This means that the consequences of the wrongful act fall to the state of origin – probably compensations. The question of consequences is, however, framed outside of the thesis and thus will not be dealt. Regarding the future activity of the

⁴²⁵ See chapter 2.3.3.2.

⁴²⁶ See e.g. Art. 14 and commentaries (1-14) ARSIWA, *supra* note 8.

AxS that has committed the norm breach, it is rather clear that the state has knowledge of wrongful act. This would mean that state has even less basis to invoke reason to preclude similar wrongfulness. To put it in other way, the responsibility over the action of the AxS is even greater after the norm breach.

The liability doctrine, as it means acts not prohibited by international law, is not applicable in the context of scenario one from the point of view of the user state.

3.3.2 Scenario two

The question, whether an internationally wrongful act has happened, is related to the primary norms of the state in question. Also, the evaluation of the norm breach is linked to the action itself and consequences related to it. It is therefore not clear whether a state bear specific, mainly convention, responsibilities in the context of scenario two. The most apparent applicable convention is United Nations Law of the Sea which is almost universally ratified. Thusly, in the present context it is assumed that it will form the norm base. Pursuant the UNCLOS, and arguably customary law, there is an obligation not cause damage to the environment of another states – in accordance with the *sic utere tuo ut alienum non laedas* principle⁴²⁷. There is no reason to believe that the main rule would not apply in the context of scenario two.

The original and intended action in the scenario two is not prohibited as such. But, the action taken led to a norm breach since it caused damage to other states. Therefore it has to be analysed whether this damage itself constitutes internationally wrongful act. Regarding this analysis, it is critical whether this is damage would rise to the level of significant or ultrahazardous. Low level damage would not constitute internationally wrongful act nor would state be liable for it. Ultrahazardous would constitute internationally wrongful act and responsibility rather surely. The level of significant damage is the problematic one.

Arguably there is an obligation to prevent significant harm from taking place. In the second scenario, the norm breach can be categorized as an accident. Thusly, the affect it had was unintended and presumably due diligence was applied through-out the process. Though the

⁴²⁷ UNCLOS, *supra* note 186; and Philippe Sands, *Principles of International Environmental Law*, *supra* note 329, at 241-246 and 869-896.

threshold of reasons to preclude wrongfulness are arguably not met because of the accidental nature of the incident. A state contributes to the situation even in cases of accidents. Hence, it can be concluded that responsibility lies within the state that has caused the accident.

The liability doctrine contributes to the analysis in that the situation in scenario two would probably invoke liability for any significant or hazardous damage even without wrongful act. However, since it has been concluded that norm breach has happened, this analysis is not that relevant.

4 Conclusion

The present thesis has been about state responsibility in the context of autonomous systems. State responsibility doctrine, as one of the prime aspects of international law, is a widely analysed doctrine of law. Responsibility questions are at the core of law and the notion of state responsibility has definitely a major role in international legal order. It is for that reason why state responsibility was chosen as the legal framework of the thesis. The premise and justification for the topic of this thesis are the growing interest in autonomy within technical solutions. In the contemporary literature these solutions are often called autonomous systems and it is the term used in this thesis as well. The thesis has been written in cooperation with the Finnish Defence Forces.

In addition to pure technological research, there is also legal, ethical and political analysis of the social impact these technologies are assumed to produce. The spreading interest is very much due to the huge potential these systems contain. The assumed changes include for example a wider range of operational capabilities and faster decision-making systems for high tempo situations. Autonomous systems are also assumed to minimise threats towards humans both because of the roles that are planned for the machines and the information these machines are assumed to provide. The critique of autonomous systems is based from ethical, and also from legal, perspectives to the lack of trust in decision-making capabilities that are given to these sets of machines. Also, the sceptics tend to underline the possible breaches of law that autonomous systems might commit. This conflict of arguments is highly visible in the context of lethal autonomous systems. System approach is also an important part of these technologies in that autonomous systems refer to sets of machines including for example sensors, elements of communication and executing apparatuses.

The purpose of the thesis was to analyse autonomous systems from legal perspective. In the meta-level the objective was to analyse whether autonomous systems, as a set of technology which changes the role of human as a decision-maker, are something that challenges the usability of the basic principle of international responsibility – namely the state responsibility. The chosen research questions were: firstly, what are the main legal issues when applying the state responsibility in the context of autonomous systems; and secondly, what special

questions arise from the framework of state responsibility regarding manufacturing, testing and using autonomous systems.

Substantively the defining term of the thesis is autonomous systems. It refers to a set of technologies that have specific autonomous features. The question of a human influence is crucial for understanding the concept. In the thesis three categories to define human role are in-the-loop, on-the-loop and off-the-loop. The in-the-loop systems are categorised as systems where a human has the control over all the action taken by the set of machines. The on-the-loop systems are systems where a human is supervising the action of the system. The off-the-loop systems have potential to act without human supervision and to a certain extent to learn and adapt in unpredictable circumstances. The categorisation illustrates rather well the different roles of humans and simultaneously the changing link between humans and a system of machines. The off-the-loop systems are the closest representation of autonomous systems. It is also acknowledged that totally off-the-loop systems do not exist as such. Therefore, while still referring to autonomous systems, it is recognised that in fact these systems are systems with autonomous capabilities.

Regarding the main legal issues when applying the state responsibility in the context of autonomous systems, the analysis concentrated on the state agent, the act of a state, the attribution of an act to one state or multiple states, the reasons to preclude wrongfulness and the action of ultra vires. This main part of the analysis was accompanied with explanation of sources of state responsibility and a short historical section to give context and depth to the answers of the main research questions. Additionally, the analysis included an overview on due diligence aspects and the relevance of liability from acts not prohibited by international law.

State responsibility culminates in two main aspects. Firstly, the action has to be internationally wrongful. A norm breach based on any source of international law is sufficient to be categorised as internationally wrongful act. These norms are called primary norms. It is worthy to underline that damage is not a precondition for wrongfulness or responsibility but it is only after a breach of international legal norm when responsibility can be established. Secondly, the internationally wrongful act in question has to be attributable to state.

Accordingly, attribution can result from an act or an omission. Both of them are equally relevant.

A machine or a technological system cannot be a state agent. It is always a person or a group of humans that form the state agent in the state responsibility doctrine. Hence, the act of a state is always done by those people – not by the machine. In order to clarify the phenomenon, an act of autonomous system becomes attributable to state through those people who are either operators of the machine (controlling, supervising, sending or inputting parameters) or those who are forming the command structure of the operation involved in the use of autonomous systems. Even when the actual norm breach might have taken place because of the decision-making process of the machine itself, it is the people behind the machine that form the attribution to state in the light of state responsibility doctrine. The actual circumstances define which one of the two is preferred if the two are separate from each other. From the state responsibility perspective the user state is the first to form attribution. This is the case especially when looking at the responsibilities related to the actions of autonomous systems. Regarding the manufacturing of autonomous systems, there are primary norms that could lead internationally wrongful acts committed by that state and thusly to international responsibility. Also, some specific aspects regarding the responsibilities of manufacturer were analysed in the scenarios.

In cases where an internationally wrongful act takes place in an operation including several states, there is a good chance that the responsibility is attributed to the participant states. Because autonomous systems may include components from several states, there is a possibility that these systems might increase the chance of joint responsibility for internationally wrongful acts. Additionally, ultra vires activity does not automatically change the attribution. Only after failing to take back the control of rebel units, the responsibility for possible wrongfulness might change. The same rule applies to the autonomous systems context. It is also important to remember that machines themselves, even when acting in an unwanted manner due to their decision-making, cannot act ultra vires – those situations are categorised as malfunctioning.

The evaluation of due diligence is relevant in the state responsibility context of autonomous systems in manufacturing, testing and using situations. Due diligence seems to be norm

specific and is not applicable in all situations as a threshold of legality. However, for many internationally wrongful acts, due diligent bona fide activity may be relevant when evaluating whether a norm breach has taken place or not. Even in cases when a norm breach has not taken place there may be liability issues to be analysed as well. Autonomous systems might in many cases engage in activities which are not internationally prohibited but are harmful for other states. In these cases, the applicable doctrine is liability doctrine – given that it is contested and remains vulnerable to criticism. Autonomous systems designers should, however, be very aware of such possibility and apply preventive measures to contain any damage that might be caused by these machines.

Regarding the second research question, the special questions arising in the context of manufacturing, testing and deploying autonomous systems, the scenario analysis produced more concrete examples and answers. The analysis contains two separate scenarios that are constructed to represent opposite sides of the issue. Methodologically the scenarios include dichotomies that represent aspects that can be assumed to be interesting in the context of autonomous systems. The scenarios are not narratives but more descriptions of possible international wrongful acts and situations leading to them.

In the first scenario, the role of a manufacturer is subjected to Article 36 of the Additional Protocol I due to the fact that the autonomous system was an autonomous weapon system. The article obligates every state to make sure that the weapon technology they are developing or adopting follows international law. Hence, both the manufacturer and the buyer of these autonomous weapon systems are subjected to this provision. Also the user state would bear responsibility over the internationally wrongful action taking place in the scenario. Hence, scenario one illustrated different issues which the building, testing, or using autonomous weapon systems may face. It also includes an analysis of possible outside influence by hacking possible responsibility to other states involved.

The second scenario includes a different type of international wrongful act. In this scenario the focus is in environmental norm breach. In this situation, primary norms arise especially from international environmental law and law of the sea frameworks. The secondary norms are rather clear since it can be established that the user state bears the responsibility over the machine they are using. The primary norm analysis, however, is closely linked to the

analysis of harm and the preventive measures. The analysis of chapter 2 also includes due diligence consideration. In the context of the harm caused to other states, testing a machine is due diligence related matter.

To summarise, the state responsibility analysis is only a first step in the legal analysis of autonomous systems. Throughout this thesis it is demonstrated that the applicability of the state responsibility doctrine in the context of autonomous systems is evident. The overall finding of the thesis is that state responsibility cannot be avoided in the cases when there are internationally wrongful acts connected to the behaviour or manufacturing of autonomous systems. Similarly all other branches of state responsibility doctrine, such as reasons to preclude wrongfulness, are applicable and relevant in the regulatory framework of autonomous systems. Also, the amount of primary norms that might be linked to the usage of autonomous systems is definitely vast and needs a lot of attention in the future. State responsibility is undoubtedly an upper level legal framework for the deployment of autonomous systems.

After the present thesis, many legal aspects of autonomous systems remain uncharted. Remaining research topics include the applicability of numerous primary norms within the limits of international criminal law, humanitarian law and human rights. In terms of domains, it can be assumed that all of them remain important. For example the law of the sea might come across questions like the definition of autonomous vessels. Also for example in cyber domain, human rights clauses related to the data collected by autonomous systems might become part of the legal debate of data protection as technologies develop. The most heated contemporary debate over the use of lethal force by autonomous systems will most likely also continue for years given the reluctance of the great weapons manufacturers to implement any restrictions to their industries. Foreseeable debate over the limits of artificial intelligence will probably open possibilities for legal analysis as well. Overall, the legal research clearly has a huge role in debate over the future of autonomous technologies.

Annexes:

Annex 1:

Scenario 1

The background and building	The testing	The usage of the system (while breaching the norm in question)	The nature of the norm breach	The timeline and duration of the usage
Built by another state and it has then purchased by the state using it.	In the negotiation stage and just before the purchase.	On the ground, in the air and/or in the space.	The premise of the norm is that it is generally considered strong and important.	Medium duration operation. The breach of an obligation takes place within hours.
Since the autonomous system is foreign built, the buyer has set the technical and operational requirements for the autonomous system they are about to buy. However, the buyer is not designing or inventing the mentioned capabilities.	Despite the best efforts, something will remain untested. These features are either unknown, something that cannot be tested, or something that is forbidden to test in the purchasing contract.	The machine is relatively far from an operator. Autonomy of the machine system is in those situations close to the off-the-loop level.	The internationally wrongful act is related to the use of force.	The norm breach ends before there was an opportunity to stop it. After the internationally wrongful act has been identified, the autonomous system fleet has been called back for investigation. However, the machines themselves are so valuable that they continue to be used in the operation later.

<p>The buyer state of the autonomous system is in loose collaboration with a company that is manufacturing the autonomous system.</p>		<p>The machine possesses capabilities to adapt its behaviour reflecting the changing operational requirements. These capabilities could be described as capability to learn new ways of problem solving especially when acting in off-the-loop missions.</p>	<p>A fleet of autonomous systems has engaged using military force against a target that later was shown to unauthorized target.</p>	<p>The effect of the internationally wrongful act is long since the situation cannot be restored and reinstated to normal.</p>
		<p>The autonomous system is military hardware and software. It is used in military led mission.</p>	<p>The geographical effect is fairly limited.</p>	
		<p>The operation in question is led by another state than owns this particular autonomous system. It is therefore a joint operation.</p>	<p>It is not a war time, even though some force has been used.</p>	

		A great amount of operational information come from foreign sources.		
		The autonomous system might be subjected to outside interference such as hacking or hijacking – it remains unclear.		

Annex 2

Scenario 2

The background and building	The testing	The usage of the system (while breaching the norm in question)	The nature of the norm breach	The timeline and duration of the usage
Built in the same state that is using it. Additionally, it has been bought from domestic company.	Throughout the whole process of designing, building and when purchasing.	On the surface of the sea and underwater.	The norm itself is recognised but there are factors of interpretation relating to the application of it.	The act that leads to an internationally wrongful act takes place in a short period of time.
Since the autonomous system is domestic build, the same state has also set the technical and operational requirements for the autonomous system. These requirements can be adjusted throughout the manufacturing process rather easily.	Something remains untested. The reason is related to the process issues and/or to the fact that they are unknown.	Rather close to the operator. Human is on-the-loop and possess a possibility to go in-the-loop mode.	Environmental norm. Polluting environment.	Instantly there is a knowledge that a breach of norm has occurred and the action is halted.

<p>The state using the autonomous system has a significant role in building it together with a domestic company.</p>		<p>Only very limited learning capabilities. The autonomous system gets its commands and procedural requirements are mostly preprogrammed.</p>	<p>The autonomous system that went to repair and assist in repairing of a broken electronic cable. While doing that it accidentally damaged an oil pipeline causing environmental damage.</p>	<p>Even though the action that led to the norm breach did not take long, the duration of the breach is long since the environmental damage cannot be stopped within a couple of days.</p>
		<p>Originally, military hardware and software used in a civilian led operation.</p>	<p>The effect is international but regional.</p>	<p>The effect of the internationally wrongful act is long. Restoring the former status is difficult, however, not impossible.</p>
		<p>Actions have been conducted under the authority of one state. There was no international cooperation related to the operation.</p>	<p>It is not a war time.</p>	

		Practically all intelligence, and other information concerning the operation, is from domestic sources of the user.		
		The autonomous system is not subjected to any outside interference.		