

Minor Dissertation

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**Nuclear liability – a comparative assessment of the  
legal situation in South Africa and Germany against  
the backdrop of international law**

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## Abbreviations

CNS	Council for Nuclear Safety
DKVG	Kernreaktor Versicherungsgesellschaft
EUR	Euro
GG	Government Gazette
GN	Government Notice
IAEA	International Atomic Energy Agency
ILC	International Law Commission
ILM	International Legal Materials
MPRDA	Mineral and Petroleum Resources Development Act
NEA	OECD Nuclear Energy Agency
NEA	Nuclear Energy Act
NEMA	National Environmental Management Act
NJW	Neue Juristische Wochenschrift
NNR	National Nuclear Regulator
NNRA	National Nuclear Regulator Act
NRWDIA	National Radioactive Waste Disposal Institute Act
OECD	Organisation for Economic Co-operation and Development
PCIJ	Publications of the Permanent Court of International Justice
R	South African Rand
RIAA	Reports of International Arbitral Awards

REG	Regulations
SDR	Special Drawing Rights
UNTS	United Nations Treaty Series
U.S.NRC	United States Nuclear Regulatory Commission
WNA	World Nuclear Association

## Chapter 1 – Introduction

### 1.1 Background

One might think nuclear energy is a topic of the last century, but it is not. While a lot of developed countries, like Germany, have opted to phase out nuclear energy, other countries cling to their nuclear power plants, like France and the United States, and then again other countries want to enhance their nuclear potential, like South Africa. The last few months have shown that the topic is not out of date. The United States, in person of President Trump, decided to expand their engagement in the nuclear sector,<sup>1</sup> while South Africa's nuclear opponents celebrated the first national nuclear case ruling against nuclear energy,<sup>2</sup> which in reality was not a ruling against the use of nuclear energy, but it shows the actuality of the topic. Furthermore, in Japan the first case started in court regarding the criminal liability of executive managers of Tepco for the Fukushima nuclear disaster six years after the accident.<sup>3</sup> In the meantime, the German government closed a deal with the German energy providers about the future of the nuclear power plants, their reconstruction and their waste,<sup>4</sup> as the last German nuclear power plant will be taken from the grid in 2022.<sup>5</sup>

These few examples already show how diverse and current the discussion of the topic nuclear energy is. The debate is also intensified by several scientific-scholars, who proclaim nuclear energy as a 'clean energy' in the days of climate change and GHG-emission.<sup>6</sup> However, the Kyoto Protocol excluded nuclear energy explicitly from its

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<sup>1</sup> <https://www.nei.org/News-Media/News/News-Archives/2017/Trump-Puts-Nuclear-First-on-America-s-Energy-Agend> accessed on 17 December 2017

<sup>2</sup> *Earthlife Africa Johannesburg v Minister of Energy* 2017 (5) SA 227 (WCC)

<sup>3</sup> <https://www.theguardian.com/environment/2017/jun/30/fukushima-nuclear-crisis-tepco-criminal-trial-japan> accessed on 17 December 2017

<sup>4</sup> <http://www.manager-magazin.de/politik/deutschland/atomare-altlasten-regierung-und-atomkonzerne-einig-ueber-entsorgung-a-1138070.html> accessed on 19 December 2017

<sup>5</sup> C Raetzke 'Nuclear third party liability in Germany' (2016) 97 *Nuclear Law Bulletin* 33; T Mann 'The legal status of nuclear power in Germany' (2014) 94 *Nuclear Law Bulletin* 43

<sup>6</sup> IAEA *Climate Change and Nuclear Power* (2016) 1-4; D Davies 'The Convention on Supplementary Compensation for Nuclear Damage and participation by developing countries: A South African perspective' (2014) 93 *Nuclear Law Bulletin* 25; WNA 'Nuclear Power in the World Today', August 2017, available at <http://www.world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx> accessed on 17 December 2017

Clean Development Mechanism, as it is not a technology beneficial to climate change.<sup>7</sup>

The topic of nuclear energy is also very relevant in South Africa, as the government considers developing its nuclear power programme due to the fact that a lot of energy is needed in times of developing the country. Therefore, nuclear resources can provide cheap energy.<sup>8</sup> South Africa currently has one nuclear power plant consisting of two reactors, both of which are operating in Koeberg in the Western Cape.<sup>9</sup>

Due to this discussion the question arises what legal consequences a development of the nuclear sector will entail, especially the topic of nuclear liability. This term includes two categories, the liability of nuclear waste and the liability in the case of an accident, such as the nuclear disasters in Chernobyl and Fukushima. The scope of the essay is limited to the latter one, nuclear liability in case of an accident.

## 1.2 Relevance of the study

As South Africa is seriously considering the expansion of nuclear energy, this study examines the questions arising in the context of nuclear liability from an international and domestic perspective. This is important, because South Africa should be aware of the consequences, which could be entailed by a larger engagement in the nuclear energy sector and the related increase of the risk of a nuclear accident. It is important to assess, if the current South African legal framework in terms of nuclear liability is sufficient and provide for enough security and compensation in case of an accident or if amendments to the legal framework should be considered.

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<sup>7</sup> D Fig 'Nuclear energy rethink? The rise and demise of South Africa's Pebble Bed Modular Reactor' (2010) 210 *ISS Paper 2*

<sup>8</sup> The government plans to provide 9.6 GW in nuclear power from 2023 until 2030. See Department of Energy *Integrated Resource Plan for Electricity Revision 2* (2010) available at [http://www.energy.gov.za/IRP/irp%20files/INTEGRATED\\_RESOURCE\\_PLAN\\_ELECTRICITY\\_2010\\_v8.pdf](http://www.energy.gov.za/IRP/irp%20files/INTEGRATED_RESOURCE_PLAN_ELECTRICITY_2010_v8.pdf) accessed on 17 December 2017 vii; Therefore, a contract was signed in September 2014 between the government of South Africa and Rosatom (the State Atomic Energy Corporation of Russia) about the building of new nuclear power plants. See WNA 'Nuclear Power in South Africa', November 2017, available at <http://www.world-nuclear.org/information-library/country-profiles/countries-o-s/south-africa.aspx> accessed on 17 December 2017

<sup>9</sup> WNA op cit (n8)

### **1.3 Key research question**

Due to these relevant assessment questions, the study will examine and compare the legislation in South Africa with international law and German law. Therefore the key research question of the study is: A critical assessment of the nuclear liability regime in South Africa against the backdrop of the international legal framework and lessons which can be learned by the case-study of the nuclear liability regime in Germany.

### **1.4 Theoretical underpinning of the study**

Nuclear liability is the core of the legal system concerning nuclear energy, as nuclear energy is an ultra-hazardous energy resource which could cause huge damage to people, their property and the environment. It is crucial to have an effective and clearly regulated legal regime, which provides for answers in the case of a nuclear accident, such as who is responsible, who has to pay for damages, which damages are compensable. Therefore, the study will outline the principles and elements of nuclear liability on the basis of ordinary law of delict and will show how the ordinary principles are refined in the nuclear liability context, before comparing and assessing the international legal framework and the domestic legislations of Germany and South Africa.

The study is therefore based on the analysis of primary legislation, which includes the relevant international conventions for nuclear liability and the relevant nuclear acts and further regulations from Germany and South Africa. As there have not been major nuclear accidents, where a claim for nuclear damage would have been possible under the discussed legal frameworks<sup>10</sup> and the nuclear liability frameworks are mainly regulated on a statutory base, the study does rarely refer to case law. Where existing, the study uses secondary resources, like books, reports and especially journal articles, to analyse the primary legislation in more detail. The literature on nuclear liability in regards to South Africa is thereby quite rare.

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<sup>10</sup> Neither Russia, nor Japan have been a member to any international nuclear convention at the time of the Chernobyl accident and the Fukushima accident, WNA 'Liability for Nuclear Damage', June 2017, available at <http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/liability-for-nuclear-damage.aspx> accessed on 17 December 2017

## 1.5 Structure

The study is divided into seven chapters.

Having introduced the topic in this chapter, chapter 2 provides a short outline about the topic nuclear energy, including how nuclear energy production works and how the technology was developed in the last decades. It focuses on damages caused by a nuclear accident.

Chapter 3 contains the international framework for nuclear liability. Therefore, it categorizes the notion of nuclear liability in regard of international responsibility in general. Afterwards it outlines the international principles of nuclear liability, which are also applicable in domestic law. It then focuses on the relevant conventions in the context of nuclear liability, by describing its functions and the relevant key articles.

Chapter 4 provides a case study of the nuclear liability regime in Germany. While the country was one of the first countries producing nuclear energy, it is now in the process of phasing out of it. It is interesting to look how Germany implemented the international framework of nuclear liability and which lessons could be learned by South Africa for its own liability regime, as Germany has a very comprehensive nuclear liability legislation.

Chapter 5 focuses on the current South African legal framework for nuclear energy and the liability for it. It examines how the country implemented the international provisions into domestic law, especially the National Nuclear Regulator Act 47 of 1999. Furthermore, it compares the German and South African legal systems and provides suggestions how South Africa could improve its legislation for a more comprehensive and better balanced nuclear liability regime.

Chapter 6 provides a conclusion, which summarises the knowledge gained about nuclear liability in the different regimes and outlines the most important findings of the study.

## Chapter 2 – Nuclear energy – a short summary

### 2.1 Introduction

The production of nuclear energy is a world-wide phenomenon. The first commercial nuclear power plants were established in the 1950s. Today, over 440 commercial nuclear power plants are operating in 31 countries with a total capacity of 390 GW and further 60 reactors are planned<sup>11</sup> Nuclear energy has a share of approximately 11 percent of the world's energy production.<sup>12</sup>

South Africa is currently the only country in Africa, which produces nuclear energy through its two nuclear reactors in Koeberg.<sup>13</sup> They have a capacity of 1.8 GW and produced 15.200 GWh of nuclear energy in 2016, which was 6.6 percent of the energy production in 2016.<sup>14</sup> Eight new reactors with a capacity of 9.6 GW are planned.<sup>15</sup> In comparison, Germany produced 80.100 GWh in 2016 with its eight remaining generators with a total capacity of 10.7 GW. This was a share of 13.1 percent of the German energy production in 2016.<sup>16</sup> Consequently, South Africa's nuclear expansion plans would result in a higher reactor capacity than Germany has today.

In describing nuclear energy production, two nuclear processes can be distinguished, namely fission and fusion.<sup>17</sup> In a nuclear fission process, energy is released when a heavy nucleus, normally a uranium or plutonium nucleus, is split into two smaller nuclei by hitting them with a neutron. The weight of the products of the fission is lighter than the initial nucleus.<sup>18</sup> This lost matter is released in the form of energy.<sup>19</sup> The fission of the nucleus releases neutrons by itself, which lead to a chain reaction and the fission of further large nuclei and the release of further energy.<sup>20</sup> The func-

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<sup>11</sup> WNA op cit (n6)

<sup>12</sup> Ibid

<sup>13</sup> WNA op cit (n8); Ghana is in the process of establishing a nuclear energy programme, IAEA *Mission report on the integrated nuclear infrastructure review (INIR) – phase 1 Ghana* (2017) available at <https://www.iaea.org/sites/default/files/documents/review-missions/inir-mission-to-ghana-january-2017.pdf> accessed on 19 December 2017 5-6

<sup>14</sup> <http://www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx> accessed on 17 December 2017

<sup>15</sup> Ibid

<sup>16</sup> Ibid

<sup>17</sup> CD Ferguson *Nuclear Energy What everyone needs to know* (2011) 7

<sup>18</sup> Ibid 10

<sup>19</sup> D Fig *Uranium Road Questioning South Africa's Nuclear Direction* (2005) 24

<sup>20</sup> Ferguson op cit (n17) 23

tion of a reactor thereby is to control this chain reaction.<sup>21</sup> All commercial nuclear power plants are operating on this process today.<sup>22</sup>

In a nuclear fusion process, energy is released when two hydrogen atoms, melt into one heavier helium atom.<sup>23</sup> This process occurs in the sun and produces its bright light. Although this kind of energy production would be of extraordinary interest, it is not yet possible to produce commercial energy through this process.<sup>24</sup>

Despite nuclear energy being a profitable energy resource, its production also entails a lot of serious risks, which can be seen when looking at the previous three serious nuclear accidents.

## 2.2 Three Mile Island accident

The first relevant nuclear accident occurred on 28 March 1979 at Unit 2 of the Three Mile Island nuclear power plant near Middletown, Pennsylvania in the USA, when the reactor partly melted down.<sup>25</sup> Due to a number of technical and human failures the cooling system of the nuclear reactor failed, which resulted in the melting of about half of the nuclear fuel pellets.<sup>26</sup> Although this is potentially the most dangerous kind of nuclear accident, the effects outside of the nuclear power plant remained small, because the reactor building stayed intact and thus kept most of the radioactive material within the building.<sup>27</sup> Therefore, in accordance to several independent studies the accident had only negligible impacts on the health of human, animals and plants,<sup>28</sup> whereby another independent study came to the result that the prevalence of cancer six years after the accident on the lee side of the nuclear power plant was significantly higher than on the windward side, partly up to 150 percent.<sup>29</sup>

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<sup>21</sup> Fig op cit (n19) 24

<sup>22</sup> <https://whatisnuclear.com/articles/nucenergy.html> accessed on 17 December 2017

<sup>23</sup> Ferguson op cit (n17) 11-12

<sup>24</sup> <https://whatisnuclear.com/articles/nucenergy.html> accessed on 17 December 2017

<sup>25</sup> U.S.NRC 'Three Mile Island Accident', February 2013, available at <https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.pdf> accessed on 17 December 2017 1

<sup>26</sup> Ibid

<sup>27</sup> Ibid

<sup>28</sup> Ibid 2

<sup>29</sup> S Wing et al. 'A Reevaluation of the Cancer Incidence near the Three Mile Island Nuclear Plant: The Collision of Evidence and Assumptions' (1997) 105 *Environmental Health Perspectives* 55, 57

However, the biggest effect of the accident, beside huge financial costs for clean-up and the loss of the revenue of the reactor,<sup>30</sup> was the newly ignited debate about nuclear energy in the USA, which reputedly enhanced the security of nuclear reactors in the USA.<sup>31</sup> After a clean-up of 14 years with the costs amounting to US Dollar 1 billion,<sup>32</sup> the reactor in Unit 2 is permanently shut down today.<sup>33</sup>

### 2.3 Chernobyl accident

The nuclear accident in the Chernobyl nuclear power plant in Ukraine was the worst accident the world has ever experienced and it had a pervasive impact on the evolution of international nuclear liability law.<sup>34</sup> It also had serious harmful impacts on human health and the natural environment, not only in the Ukraine, but also in its neighbouring countries.<sup>35</sup> On 26 April 1986 the operator simulated a blackout to test its security features.<sup>36</sup> Caused by serious disregard of safety regulations and special design characteristics of the reactor, an uncontrolled power increase occurred. This finally led to the explosion of the reactor in Unit 4 and destroyed the roof of the reactor building.<sup>37</sup> Hereafter a fire broke out. Especially the graphite, which was used as a moderator in the reactor, started burning. Due to these circumstances, the firefighters on the site incurred a lot of radiation, which cost the lives of 31 of them.<sup>38</sup>

Furthermore, large amounts of radioactive substances were released into the atmosphere. The scope of the accident spread out over the whole northern hemisphere. People in Belarus, the Ukraine and Russia, who experienced health and socio-

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<sup>30</sup> Ferguson op cit (n17) 148

<sup>31</sup> Ferguson op cit (n17) 149; U.S.NRC op cit (n25) 1

<sup>32</sup> <http://www.nytimes.com/1993/08/15/us/14-year-cleanup-at-three-mile-island-concludes.html> accessed on 18 November 2017

<sup>33</sup> U.S.NRC op cit (n25) 4

<sup>34</sup> JA Schwartz 'International Nuclear Third Party Liability Law: The Response to Chernobyl' in NEA & IAEA *International Nuclear Law in the Post-Chernobyl Period* (2006) 37; Ferguson op cit (n17) 149

<sup>35</sup> Schwartz op cit (n34) 37

<sup>36</sup> Ferguson op cit (n17) 149-151

<sup>37</sup> Ferguson op cit (n17) 149-151; NEA *Chernobyl: Assessment of Radiological and Health Impacts* (2002) available at <https://www.oecd-nea.org/rp/pubs/2003/3508-chernobyl.pdf> accessed on 17 December 2017 28

<sup>38</sup> NEA op cit (n37) 29

economic impacts, caused by the radiation were the most affected victims.<sup>39</sup> Today, about five million people still live in radioactive contaminated areas.<sup>40</sup>

Besides the 31 people, who died as an acute result of the accident, 237 people were diagnosed to suffer from radiation sickness.<sup>41</sup> Regarding the long term impacts of the accident, a significant increase of thyroid cancer, especially among children, was brought up by several studies, but negative social and psychological effects were also registered.<sup>42</sup>

Furthermore, about 135.000 people had to be evacuated within a 30 kilometre radius, mostly from the nearby town of Pripjat, which is still uninhabited today.<sup>43</sup> The accident had detrimental effects on agriculture and environment. About 200.000 km<sup>2</sup> of agricultural land in the nearby area was contaminated by the accident with radiation and large amounts of food products had to be destroyed.<sup>44</sup> In the following, bans and restrictions on food products were put in place and are partly still in place today.<sup>45</sup> Several agricultural farms in other parts of Europe were subject to these restrictions, as they also experienced impacts of the accident.<sup>46</sup> Additionally, the natural environment was affected. Natural products, like fish, mushrooms, berries and game meat are still suffering from radiation and the contamination of groundwater in the Chernobyl area could also become an issue in the future.<sup>47</sup> The estimated total costs for the accident have been calculated to be hundreds of billion US dollars.<sup>48</sup>

## 2.4 Fukushima accident

On 11 March 2011, a massive earthquake (9.0 on the Richter scale) rocked the Miyagi Prefecture coast in Japan. It triggered a devastating tsunami which attacked

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<sup>39</sup> Schwartz op cit (n34) 37

<sup>40</sup> Ibid

<sup>41</sup> NEA op cit (n37) 78-79; Schwartz op cit (n34) 37

<sup>42</sup> NEA op cit (n37) 81; Schwartz op cit (n34) 37; Ferguson op cit (n17) 151

<sup>43</sup> Ferguson op cit (n17) 151-152; Schwartz op cit (n34) 37

<sup>44</sup> Schwartz op cit (n34) 37; NEA op cit (n37) 100

<sup>45</sup> Schwartz op cit (n34) 37

<sup>46</sup> NEA op cit (n37) 108

<sup>47</sup> Ibid

<sup>48</sup> Ferguson op cit (n17) 152; Schwartz op cit (n34) 38

the Fukushima Daiichi nuclear power plant.<sup>49</sup> Although the shutdown operations were implemented correctly, the cooling system failed due to the flooding of the emergency diesel generators.<sup>50</sup> The following overheating of the reactor's core and different chemical reactions, mainly between zirconium and water, caused the formation of hydrogen gas. This entailed gas explosions, which damaged the reactor buildings.<sup>51</sup> Despite the fact that in contrast to the Chernobyl accident, the core reactors were not damaged,<sup>52</sup> huge amounts of radioactive material, mostly in gas-form, were released in the atmosphere but also into the Pacific Ocean.<sup>53</sup> According to reports, the reactor units 1-3 released radioactive materials of an amount 168.5 times that of the Hiroshima atomic bomb.<sup>54</sup> The accident was classified as a level seven incident, equal to the Chernobyl accident, which is the highest level on the International Nuclear Event Scale.<sup>55</sup> It was significant for this accident that more than one reactor was involved, while the Three Mile Island and the Chernobyl accident were limited to one reactor.<sup>56</sup>

The extent of damage caused by the Fukushima accident cannot be conclusively measured today. Nevertheless, 80.000 people had to be evacuated in a radius of 20 km<sup>57</sup> and food product restrictions were put in place.<sup>58</sup> Despite the fact that the Fukushima accident entailed consequences not as bad as the Chernobyl accident, a significant increase of radiation in all relevant biota could be measured,<sup>59</sup> including Europe and North America.<sup>60</sup> Furthermore, an increase of non-radiation related diseases, such as anxiety, posttraumatic stress and depression had been noted subsequently to

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<sup>49</sup> C-K Kim et al. 'Radiological impact in Korea following the Fukushima nuclear accident' (2011) 111 *Journal of Environmental Radioactivity* 70; G Steinhauser et al. 'Comparison of the Chernobyl and Fukushima nuclear accidents: A review of the environmental impacts' (2014) 470-471 *Science of the Total Environment* 801

<sup>50</sup> Ferguson op cit (n17) 164

<sup>51</sup> Steinhauser et al. op cit (n49) 801

<sup>52</sup> Ibid

<sup>53</sup> Y Kim et al. 'Effect of the Fukushima nuclear disaster on global public acceptance of nuclear energy' (2013) 61 *Energy Policy* 822; Ferguson op cit (n17) 165-166; Kim et al. op cit (n49) 70

<sup>54</sup> Kim et al. op cit (n53) 822

<sup>55</sup> Ibid

<sup>56</sup> Ferguson op cit (n17) 167

<sup>57</sup> Kim et al. op cit (n53) 822

<sup>58</sup> Steinhauser et al. op cit (n49) 814

<sup>59</sup> Ibid

<sup>60</sup> Kim et al. op cit (n53) 822

the Fukushima accident.<sup>61</sup> The process of recovery and monitoring is still going on today.<sup>62</sup>

## 2.5 Conclusion

The accidents illustrate the serious detrimental impacts, which nuclear accidents can have and the consequences they could entail on human health and safety, the environment including animals and plants, as well as the huge clean-up costs. These potential risks must always be born in mind, when talking about the presumably attractive resource nuclear energy. Furthermore, especially after the Chernobyl accident, the world community recognized the dimension of nuclear disasters and its trans-boundary character, which strengthened the pressure to improve the international regulations.<sup>63</sup> The evolution of the international framework and its responses to the Chernobyl accident will be discussed in the next chapter.

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<sup>61</sup> Steinhauser et al op cit (n45) 814

<sup>62</sup> <https://www.iaea.org/newscenter/focus/fukushima> accessed on 20 November 2017

<sup>63</sup> Schwartz op cit (n34) 38

## Chapter 3 – Nuclear liability in the context of international law

### 3.1 Introduction

As seen above, nuclear energy is a valuable energy resource. Although there was a great enthusiasm for this technique from the beginning, the persons responsible recognized early, that it would involve hazards, which could not be compared to conventional risks, because of the potential extent of the damage and its particular characteristics.<sup>64</sup> The global community recognized that there was a crucial need for public safeguards in order to be prepared for the case of a nuclear accident, if one made extensive use of nuclear energy.<sup>65</sup> It was admitted that it is not possible to create a completely safe reactor: ‘We must recognise that the only way to be absolutely safe is not to build a reactor at all.’<sup>66</sup> The Chernobyl accident illustrated these concerns painfully and showed the extent of damage, which could be caused by a nuclear incident.<sup>67</sup> Due to these facts it was indispensable to establish a legal system which deals on the one hand with safety standards and the conduct in case of an accident and on the other hand with the liability for damages caused by an accident.<sup>68</sup> As the scope of the study is limited to the latter topic, the international law will be only discussed regarding the international nuclear liability instruments.<sup>69</sup> The chapter will introduce the notion of nuclear liability by contextualising it within the wider topic of international responsibility. Afterwards it will outline the general principles of nuclear liability and discuss the relevant international conventions.

### 3.2 Nuclear liability in the context of international responsibility

To get a better understanding of nuclear liability, the study will outline the special features of the notion in the context of international responsibility. Therefore, it will outline the traditional concept of international responsibility – state responsibility – and will show why this concept does not fit for high risk and hazardous, yet lawful

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<sup>64</sup> V Boulanenkov & B Brands ‘Nuclear Liability: Status and Prospects’ (1988) 4 *IAEA Bulletin* 5

<sup>65</sup> MJL Hardy ‘Nuclear Liability: The general principles of law and further proposals’ (1960) 36 *British Yearbook of International Law* 224

<sup>66</sup> CG McCullough, Chairman of the United States Advisory Committee on Reactor Safety, in *Atomic Industrial Forum Management economics and technology for the atomic industry: proceedings of the annual conference for members and guests, Sept. 25-27, 1956, Morrison Hotel, Chicago* (1956) 173

<sup>67</sup> see chapter 2.3

<sup>68</sup> C Stoiber et al. *Handbook on Nuclear Law* (2003) 107

<sup>69</sup> for an overview about the conventions and codes concerning nuclear safety and emergency cases, see <http://www-ns.iaea.org/conventions/default.asp?s=6&l=44> accessed on 17 December 2017

activities, such as the production of nuclear energy is one. Afterwards, it will introduce the alternative concept of civil liability and how the nuclear liability regime is embedded in this framework.

### 3.2.1 The traditional definition of international responsibility

Responsibility is a core element of international law and interacts strongly with the concept of sovereignty.<sup>70</sup> The obligation to provide reparation for damage is an immanent part of the Law of Nature and the very basis of the notion of international responsibility.<sup>71</sup> In other words, ‘it is a principle of law, and even a general conception of law, that any breach of an engagement involves an obligation to make reparation.’<sup>72</sup> This approach means that for every breach of international law, which has caused damages, compensation must be provided.<sup>73</sup> While states are generally the subject of international provisions and therefore the responsible entity, claims for compensation are only applicable in an inter-state relation.<sup>74</sup> This sole inter-state relation is expressed by the term state responsibility. It deals with the accountability of states in the case of the breach of obligations applicable to and binding on the state under international law.<sup>75</sup> In relation to these breaches, claims between states are normally brought directly before an international court or tribunal. This also means that individuals and corporations are not allowed to bring a claim to an international court or tribunal.<sup>76</sup>

Furthermore, the international law does not distinguish if the breach is part of the law of contract, delict or criminal law.<sup>77</sup> This is expressed by the judgement of the arbitral tribunal in the *Rainbow Warrior* case as

‘the general principles of International Law concerning State responsibility are equally applicable in the case of breach of treaty obligation, since in the

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<sup>70</sup> A Pellet ‘The Definition of Responsibility in International Law’ in J Crawford et al. *The Law of International Responsibility* (2010) 3

<sup>71</sup> Pellet op cit (n70) 5

<sup>72</sup> *Factory at Chorzow (Germany v. Poland)*, 13 September 1928, 1928 *PCIJ* series A No. 17, para 73

<sup>73</sup> Pellet op cit (n70) 5

<sup>74</sup> Ibid

<sup>75</sup> P Birnie et al. *International Law & The Environment* 3ed (2009) 214; J Crawford ‘The System of International Responsibility’ in J Crawford et al. *The Law of International Responsibility* (2010) 20

<sup>76</sup> Birnie et al. op cit (n75) 222

<sup>77</sup> Crawford op cit (n75) 21

international law field there is no distinction between contractual and tortious responsibility, so that any violation of a State of any obligation, of whatever origin gives rise to State responsibility.<sup>78</sup>

The reason for such a single approach is that in contrast to national law, the international rules have to address a vast range of concerns and needs on the basis of only few tools and regulations. Hence international treaties often cover a wide range of functions, such as legislative and contractual issues.<sup>79</sup>

A further deficit arises, when it comes to liability for harmful consequences of lawful activities.<sup>80</sup> The concept of state liability does not fit in this context. Due to the requirement of fault, a state cannot be held liable for unforeseeable or unavoidable damages caused by lawful activities of the private sector.<sup>81</sup> For states to be held liable under these circumstances, the principle of fault would have to be abrogated in this context. However, this would undermine the ‘polluter pays’ principle (Principle 16 of the Rio Declaration on Environment and Development<sup>82</sup>).<sup>83</sup> Therefore, state responsibility is not suited to address global environmental liability issues.<sup>84</sup> Instead, a direct liability of the company which caused the pollution and damage would satisfy a ‘polluter pays’ approach.<sup>85</sup>

Nevertheless, the international community fostered the development of international state liability regimes through the International Law Commission (ILC),<sup>86</sup> although

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<sup>78</sup> *Rainbow Warrior (New Zealand v France)*, 30 April 1990, 20 *RIAA* 215, para 75

<sup>79</sup> Crawford op cit (n75) 21

<sup>80</sup> Birnie et al. op cit (n75) 221-223; J Brunnée ‘Of sense and sensibility: Reflections on international liability regimes as tools for environmental protection’ (2004) 53 *International and Comparative Law Quarterly* 354-356

<sup>81</sup> Birnie et al. op cit (n75) 221

<sup>82</sup> Rio Declaration on Environment and Development, Annex I, Report of the UN Conference on Environment and Development, 3-14 June 1992, UN Doc. A/CONF.151/26 vol. I

<sup>83</sup> Birnie et al. op cit (n75) 222

<sup>84</sup> T Scovazzi ‘State Responsibility for Environmental Harm’ (2001) 12 *Yearbook of International Environmental Law* 43, 51

<sup>85</sup> Birnie et al. op cit (n69) 222

<sup>86</sup> The ILC developed the ILC Articles on State Responsibility (Draft Articles on Responsibility of States for Internationally Wrongful Acts in: Report of the International Law Commission on the Work of Its Fifty-Third Session, UN GAOR, 56th Session, Supplement No 10, at 43, November 2001, UN Doc. A/56/10, chapter IV.E.1), which stipulate responsibility for environmental harm, but their practical outcome is quite rare, as most transboundary environmental concerns are solved through negotiations and a lot of legal questions have not been addressed yet. See Brunnée op cit (n80) 353

these approaches were not successful.<sup>87</sup> The former idea of creating an overarching concept of state liability was reduced to the discussion of ‘allocation of loss’.<sup>88</sup> The Special Rapporteur for the topic finally recommended focusing on the development of civil liability instead of state liability.<sup>89</sup> Even the sole attempt so far to create an overarching regime for civil liability, the 1993 Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment<sup>90</sup>, was not successful at all<sup>91</sup> and it has not been ratified by any State and thereby has not entered into force yet.<sup>92</sup>

Due to these conceptual deficits state responsibility does not play a practical role in the context of liability for environmental damages and its potential continues to be limited.<sup>93</sup> Until today the international law does not provide any overarching rules for harmful consequences of lawful, non-prohibited activities.<sup>94</sup>

### 3.2.2 Civil liability regimes

Due to the stated deficits, an alternative approach, namely civil liability, was simultaneously developed for specific, ultra-hazardous and high-risk activities since the 1960s, such as for maritime transport of oil or the use of nuclear energy.<sup>95</sup> The regimes aim to harmonize national legislation concerning liability of private entities,<sup>96</sup> which seems to be a better fitting and more efficient approach for the liability of issue-specific harmful activities,<sup>97</sup> as they channel liability and costs to the operator and allow victims to bring claims to court.<sup>98</sup> Their main goal is, on the one hand, to facilitate the assert of claims for compensation of pollution damages caused by activ-

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<sup>87</sup> Brunnée op cit (n80) 355

<sup>88</sup> Ibid

<sup>89</sup> PS Rao *First report on the legal regime for allocation of loss in case of transboundary harm arising out of hazardous activities* (2003) UN Doc. A/CN.4/531 para 114; Brunnée op cit (n80) 356

<sup>90</sup> Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment, 21 June 1993, 32 *ILM* 1128

<sup>91</sup> Brunnée op cit (n80) 356; Birnie et al. op cit (n75) 220

<sup>92</sup> P Sands & J Peel *Principles of International Environmental Law* 3ed (2012) 738;

<http://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/150/signatures> accessed on 17 December 2017

<sup>93</sup> Brunnée op cit (n80) 352

<sup>94</sup> M Montjoie ‘Nuclear Energy’ in J Crawford et al. *The Law of International Responsibility* (2010) 915

<sup>95</sup> Sands & Peel op cit (n92) 738; Montjoie op cit (n94) 916

<sup>96</sup> Birnie et al. op cit (n75) 214; Sands & Peel op cit (n92) 737

<sup>97</sup> Brunnée op cit (n80) 356; Montjoie op cit (n94) 916

<sup>98</sup> Brunnée op cit (n80) 352; Brinie et al. op cit (n69) 521

ities, which entail a particular risk of hazardous damage, even when they are undertaken with all due care.<sup>99</sup> On the other hand, the regimes aim to protect operators from the risk of excessive claims, which would make it impossible for them to carry out these kinds of activities.<sup>100</sup> In general, all civil liability regimes follow a similar approach and include several main elements, ‘which

- (1) define the activities or substances covered;
- (2) define the damage (to persons, property and the environment);
- (3) channel liability;
- (4) establish a standard of care (usually strict liability);
- (5) provide for liability amounts;
- (6) allow exonerations;
- (7) require the maintenance of adequate insurance or other financial security;
- (8) identify a court or tribunal to receive the claims; and
- (9) provide for the recognition and enforcement of judgments.’<sup>101</sup>

In the meantime international treaties had been already adopted concerning damages caused by hazardous substances and wastes<sup>102</sup>, living modified organisms<sup>103</sup> and environmental damages caused by certain dangerous activities.<sup>104</sup>

### 3.2.3 The nuclear liability regime

The international convention system concerned with nuclear liability could be in general classified as a civil liability regime.<sup>105</sup> It channels the liability to the operator, thus a private entity, and aims to harmonize the national legislation for nuclear liability including transboundary damage.<sup>106</sup> However, the nuclear liability regime is not

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<sup>99</sup> Brunnée op cit (n80) 357

<sup>100</sup> Ibid

<sup>101</sup> Sands & Peel op cit (n92) 738; see also Birnie et al. op cit (n75) 316

<sup>102</sup> Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 22 March 1989, 1673 *UNTS* 126

<sup>103</sup> Nagoya - Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety, 15 October 2010, UN Doc. UNEP/CBD/BS/COP-MOP/5/17

<sup>104</sup> Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes and to the 1992 Convention on the Transboundary Effects of Industrial Accidents, 21 May 2003, UN Doc. ECE/MP.WAT/11-ECE/CP.TEIA/9

<sup>105</sup> Brunnée op cit (n80) 357

<sup>106</sup> Birnie et al. op cit (n75) 521

solely based on civil liability aspects, it rather also enshrines elements of state responsibility.<sup>107</sup> Insofar it includes provisions regarding the state as the guarantor for the strict liability of the operator and partly stipulates the obligation of additional compensation funds,<sup>108</sup> which are classified as state responsibility elements.<sup>109</sup> Despite the fact that this inclusion does not satisfy the ‘polluter-pays’ principle in full,<sup>110</sup> the combination of both systems is important in favour of an effective liability regime. The influence of state responsibility will be outlined during the study where it is significant.

### **3.3 International legal framework of nuclear liability**

As seen in chapter 1 the study will focus on the civil liability aspect of nuclear energy, thus the international legal context will only be covered in relation to the civil liability aspects. The first time regulations dealing with nuclear incidents can be found is in the domestic US legislation in the 1957 Price Anderson amendment to the 1954 Atomic Energy Act, which can be seen as the foundation of nuclear third party liability.<sup>111</sup> Not only the US government was concerned about nuclear incidents, but also the international community was discussing an international legal framework concerning nuclear incidents, as detrimental effects of nuclear accidents would not stop at state borders.<sup>112</sup> Due to this potential transboundary character of nuclear damage, the need of an international nuclear liability regime was early recognized.<sup>113</sup> This finally led to the adoption of the 1960 Convention on Third Party Liability in the Field of Nuclear Energy<sup>114</sup> (Paris Convention), followed by a range of conven-

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<sup>107</sup> Birnie et al. op cit (n75) 517

<sup>108</sup> Ibid

<sup>109</sup> Sands & Peel op cit (n92) 701

<sup>110</sup> Birnie et al. op cit (n75) 317

<sup>111</sup> Montjoie op cit (n94) 916

<sup>112</sup> Stoiber et al. op cit (n68) 107

<sup>113</sup> Ibid

<sup>114</sup> Convention on Third Party Liability in the Field of Nuclear Energy, 29 July 1960, 956 *UNTS* 263; the study refers to the version of the convention as amended by the Additional Protocol to the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, 28 January 1964, 956 *UNTS* 335 and the Protocol to Amend the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, as amended by the Additional Protocol of 28 January 1964, 16 November 1982, 1519 *UNTS* 329

tions.<sup>115</sup> This chapter will introduce this convention system, after having outlined the general principles of nuclear liability.

### 3.3.1 Principles of nuclear liability in the international legal framework

Despite the fact that there are several international legal regimes for nuclear liability, they are all based on the same ideas and follow certain principles. The principles were developed and established on the basis of two facts.<sup>116</sup> First, the international community recognized that the public must be protected against the potential risks of nuclear activities, which are much higher than the risks of conventional industries.<sup>117</sup> Second, it was realised that not only must the public be protected, but also the owner, operators, builders and suppliers of nuclear power plants. If the liability were potentially unlimited, they would be in danger of insolvency, which would endanger the development of the nuclear industry.<sup>118</sup> Due to these facts the international community thought to solve this conflict by eliminating the legal and financial obstacles to the nuclear industry, while guaranteeing adequate compensation for damage of third parties.<sup>119</sup> These objectives can be also read from the preamble of the Paris Convention, which aims to ensure

‘adequate and equitable compensation for persons who suffer damage caused by nuclear incidents whilst taking the necessary steps to ensure that the development of the production and uses of nuclear energy for peaceful purposes is not thereby hindered.’<sup>120</sup>

Fulfilling these objectives also meant to modify the rules of conventional law of delict (tort law).<sup>121</sup> They are oriented to inhibit the compensation of victims in the context of conventional industrial risks and provide therefore unlimited liability amounts

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<sup>115</sup> Montjoie op cit (n94) 916

<sup>116</sup> Schwartz op cit (n34) 39

<sup>117</sup> Schwartz op cit (n34) 39

<sup>118</sup> Ibid

<sup>119</sup> Ibid

<sup>120</sup> preamble Paris Convention

<sup>121</sup> Stoiber et al. op cit (n68) 107; Schwartz op cit (n34) 39

for unlimited periods of time.<sup>122</sup> This makes them not appropriate to bring the outlined objectives in balance.<sup>123</sup>

### 3.3.1.1 Strict liability

The operator<sup>124</sup> of a nuclear installation<sup>125</sup> is strictly liable for all damage to third parties<sup>126</sup> caused by a nuclear incident<sup>127</sup> of its nuclear installation or during the transport of nuclear material from or to its nuclear installation. Strict liability entails the fact that a claimant is not obliged to prove fault or negligence of the operator; the operator is also liable without fault or negligence on its part.<sup>128</sup> The mere existence of causality between the nuclear incident and the caused damage is enough for the operator's liability.<sup>129</sup> As the majority of people have no idea about the technical occurrences in case of an accident, the strict liability regime provides a relief for claimants in achieving their rights.<sup>130</sup>

The strict liability approach contrasts the ordinary law of delict, where it is crucial to proof fault or negligence, although the idea of strict liability is common in other specified areas of the law of delict.<sup>131</sup>

### 3.3.1.2 Exclusive liability

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<sup>122</sup> Schwartz op cit (n34) 39

<sup>123</sup> Stoiber et al. op cit (n68) 107; Schwartz op cit (n34) 39

<sup>124</sup> The operator is normally the person who is in charge of a nuclear installation. In the conventions the operator is the person (an individual or any entity having a legal personality) designated by the installation state as operator, which is left to discretion to the state, but is normally the licence holder. See Stoiber et al. op cit (n68) 110

<sup>125</sup> A nuclear installation contains 'reactors other than those comprised in any means of transport; factories for the manufacture or processing of nuclear substances; factories for the separation of isotopes of nuclear fuel; factories for the reprocessing of irradiated nuclear fuel; facilities for the storage of nuclear substances other than storage incidental to the carriage of such substances; and such other installations in which there are nuclear fuel or radioactive products or waste (...).' See article 1(a)(ii) Paris Convention

<sup>126</sup> Nuclear liability in the used context always means nuclear third party liability. Thereby, a third party is anyone other than a nuclear operator and its suppliers of goods, services or technology for use in nuclear installations. The definition covers humans inside and outside of a nuclear installation, which also includes employees of the operator. However, the employees also have further rights to claim through public health insurances or social security systems in most countries. See Schwartz op cit (n34) 39

<sup>127</sup> A nuclear incident 'means any occurrence (...) that causes nuclear damage or, but only with respect to preventive measures, creates a grave and imminent threat of causing such damage.' See Stoiber et al. op cit (n68) 110, the study also uses the term 'nuclear accident' as a synonym

<sup>128</sup> Stoiber et al. op cit (n68) 111

<sup>129</sup> Ibid

<sup>130</sup> Birnie et al. op cit (n75) 522; Schwartz op cit (n34) 39-40; Montjoie op cit (n94) 916

<sup>131</sup> Schwartz op cit (n34) 40

Furthermore, an operator is also exclusively liable for damage to third parties caused by a nuclear incident in its nuclear installation or even during the transport of nuclear substances from or to its installation.<sup>132</sup> That means the operator is liable regardless of whose act caused the accident and even its carriers are spared of liability.<sup>133</sup> The reason why is that otherwise suppliers would have to maintain an additional costly insurance for the liability, which would be a massive amount of entities.<sup>134</sup> The advantage for victims is that they do not have to identify the accountable person, as this would be very difficult after a nuclear incident, rather they can focus on the operator.<sup>135</sup>

This is also a special feature compared to the ordinary law of delict, as there normally the acting party must be held liable, although there are some exceptions, for example, where employers are accountable for their employees or where an ordering customer could be held liable for his supplier in specific circumstances.<sup>136</sup>

### 3.3.1.3 Exonerations of liability

Due to the strict and exclusive liability, several kinds of exonerations are provided. They normally include these circumstances: the nuclear accident was a direct result of an armed conflict, hostilities, civil war or insurrection.<sup>137</sup> Exonerations are also applicable in cases in which the victims contributed to the nuclear accident through gross negligence or intent.<sup>138</sup>

### 3.3.1.4 Limited liability in amount

The limitation of the liability of the operator in amount is an important principle, which is a real advantage for the operator.<sup>139</sup> As governments wanted to encourage the nuclear industry, they relieved them from potentially ruinous liability claims in case of a nuclear incident.<sup>140</sup> The limitation of amount can be seen as equalization for

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<sup>132</sup> Stoiber et al. op cit (n68) 112; Schwartz op cit (n34) 40; Birnie et al. op cit (n75) 522

<sup>133</sup> Schwartz op cit (n34) 40

<sup>134</sup> Ibid

<sup>135</sup> Schwartz op cit (n34) 40; Montjoie op cit (n94) 916

<sup>136</sup> section 831 *Bürgerliches Gesetzbuch* (German Civil Code), Bundesgesetzblatt 2002 I 42, 2909

<sup>137</sup> Stoiber et al. op cit (n68) 113

<sup>138</sup> Davies op cit (n6); Stoiber et al. op cit (n68) 113

<sup>139</sup> Stoiber et al. op cit (n68) 113

<sup>140</sup> Schwartz op cit (n34) 40

the benefits the victims gained from strict and exclusive liability of the operator.<sup>141</sup> The amount of liability and compensation is determined by each convention and has always been a major issue in the debates leading to the conventions.<sup>142</sup>

In addition, most governments provide a supplementary financial fund, because they recognise that in case of a major incident the insurances of the operator will not cover all damages. This can be seen as some kind of state responsibility in the predominant system of civil liability.<sup>143</sup>

### 3.3.1.5 Financially secured liability

As intimated above, operators of nuclear installations are obliged to maintain financial security insurances covering their liability amount for nuclear damage.<sup>144</sup> This congruence principle ensures the ability of the operator to provide compensation in case of an incident.<sup>145</sup> Usually, insurances are provided by the private sector, but alternative concepts are also possible, such as state or bank provided guarantees, operator pooling systems or self-insurance (normally only permitted when nuclear installation is owned or operated by the state).<sup>146</sup>

### 3.3.1.6 Limited liability in time

Due to the fact that insurance providers clarified that their financial coverage must be limited in time, the liability of nuclear operators is also limited in time.<sup>147</sup> Claims must be normally submitted within ten years from the date of the nuclear incident for property damages and personal injury,<sup>148</sup> in deviation of ordinary law of delict, which stipulates a time limit of 30 years.<sup>149</sup> However, recently the time limit for personal injury was extended to 30 years in the international convention system.<sup>150</sup> Furthermore, several jurisdictions include a ‘discovery rule’, which means, that victims

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<sup>141</sup> Schwartz op cit (n34) 40; Montjoie op cit (n94) 916

<sup>142</sup> Stoiber et al. op cit (n68) 113

<sup>143</sup> Schwartz op cit (n34) 40-41

<sup>144</sup> Stoiber et al. op cit (n68) 114; Schwartz op cit (n34) 40

<sup>145</sup> Stoiber et al. op cit (n68) 114

<sup>146</sup> Schwartz op cit (n34) 41

<sup>147</sup> Ibid

<sup>148</sup> Ibid

<sup>149</sup> Stoiber et al. op cit (n68) 113

<sup>150</sup> Ibid

must claim for damages within two or three years after they received notice of the damage for which they can claim compensation.<sup>151</sup>

### 3.3.1.7 Non-discrimination rule

A further principle stipulates that the conventions and the domestic law must be applicable, irrespective of the nationality, domicile or residence.<sup>152</sup> This ensures that victims suffering damage in a state other than the accident state benefit from the same treatment as victims in the accident state.<sup>153</sup>

### 3.3.1.8 Jurisdiction

In case of a nuclear accident, the jurisdiction of many courts would arise due to general procedural law.<sup>154</sup> Therefore, international conventions stipulate, on the one hand, that the courts of the country in which the nuclear accident occurred have exclusive jurisdiction, and on the other hand, that states have to ensure that only one court in their country is competent for claims relating to a nuclear accident.<sup>155</sup>

### 3.3.1.9 Conclusion

These principles are the basis of the international legal framework for nuclear liability, but as the international regime harmonizes the domestic legislation of the contracting states, they are also part of the national nuclear liability regimes, which will be outlined in chapter 4 and 5.

## 3.3.2 Convention system

There is a whole system of treaties and protocols, which deal with the topic of civil nuclear liability; hence it is important to provide an overview of the different regimes before going into the details. In brief, there are four international conventions which provide a special regime for civil liability of nuclear liability. Firstly, the 1960 Convention on Third Party Liability in the Field of Nuclear Energy<sup>156</sup> (Paris Convention), which covers nuclear incidents in Western Europe overseen by the OECD Nu-

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<sup>151</sup> Schwartz op cit (n34) 41

<sup>152</sup> Stoiber et al. op cit (n68)

<sup>153</sup> Stoiber et al. op cit (n68) 115; Davies op cit (n6) 29

<sup>154</sup> Stoiber et al. op cit (n68) 115

<sup>155</sup> Stoiber et al. op cit (n68) 115; Davies op cit (n6) 29

<sup>156</sup> see footnote 120

clear Energy Agency<sup>157</sup> (NEA) and to which all Western European nuclear states are party.<sup>158</sup> The Paris Convention is complemented by the 1963 Convention Supplementary to the Convention on Third Party Liability in the Field of Nuclear Energy<sup>159</sup> (Brussels Convention), to which a state can only become party, if it has signed the Paris Convention. The Brussels Convention provides additional financial compensations for victims.<sup>160</sup> Secondly, the 1963 Vienna Convention on Civil Liability for Nuclear Damage<sup>161</sup> (Vienna Convention) was adopted under the auspices of the International Atomic Energy Agency<sup>162</sup> (IAEA) and provides an international system for global participation based on the same principles as the Paris Convention.<sup>163</sup> Thirdly, in response to the Chernobyl accident the 1988 Joint Protocol on the application of the Vienna Convention and the Paris Convention<sup>164</sup> (Joint Protocol) was established to link both conventions.<sup>165</sup> Finally, coupled with certain revisions to the Vienna Convention through the 1997 Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage<sup>166</sup> (VC Protocol), the 1997 Convention on Supplementary Compensation for Nuclear Damage<sup>167</sup> (Convention on Supplementary

<sup>157</sup> The NEA is an intergovernmental agency which facilitates cooperation between countries with nuclear technology infrastructure. It is attached to the OECD and is operating worldwide through Europe, America and Asia with currently 33 countries, covering approximately 84 per cent of the world's nuclear capacity. See <http://www.oecd-nea.org/general/about/> accessed on 17 December 2017

<sup>158</sup> Birnie et al. op cit (n75) 520

<sup>159</sup> Convention Supplementary to the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, 31 January 1963, 1041 *UNTS* 358; the study refers to the version of the convention as amended by the Additional Protocol to the Convention of 31 January 1963 Supplementary to the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, 28 January 1964, 1041 *UNTS* 410 and the Protocol to Amend the Convention of 31 January 1963 Supplementary to the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, as amended by the Additional Protocol of 28 January 1964, 16 November 1982, 1650 *UNTS* 446

<sup>160</sup> Montjoie op cit (n94) 917

<sup>161</sup> Vienna Convention on Civil Liability for Nuclear Damage, 21 May 1963, 1063 *UNTS* 265

<sup>162</sup> The IAEA 'is the central intergovernmental forum for scientific and technical co-operation in the nuclear field. It works for the safe, secure and peaceful uses of nuclear science and technology, contributing to international peace and security and the United Nations' Sustainable Development Goals.' See <https://www.iaea.org/about/overview/> accessed on 17 December 2017; There are currently 169 states member to the IAEA, including Germany and South Africa. See <https://www.iaea.org/about/governance/list-of-member-states> accessed on 17 December 2017

<sup>163</sup> Montjoie op cit (n94) 917

<sup>164</sup> Joint Protocol Relating to the Application of the Vienna Convention on Civil Liability for Nuclear Damage and the Convention on Third Party Liability in the Field of Nuclear Energy, 21 September 1988, 1672 *UNTS* 302

<sup>165</sup> Birnie et al. op cit (n75) 521

<sup>166</sup> Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, 12 September 1997, 2241 *UNTS* 302

<sup>167</sup> Convention on Supplementary Compensation for Nuclear Damage, 12 September 1997, NFCIRC/567

Compensation) was adopted to encourage the participation of Eastern European nuclear countries and especially Russia in the international liability regime.<sup>168</sup> These four conventions and selected amendments to the Paris Convention and the Vienna Convention are presented in detail. The study will introduce them in a chronological way, as it is the easiest way to understand them and the development of the nuclear liability regime.

There are two more treaties related to the topic of nuclear liability. The first one deals with nuclear ships<sup>169</sup> and the second one with maritime carriage of nuclear materials.<sup>170</sup> As the scope of the study includes only the general framework for nuclear liability of nuclear installations and the conventions are only barely ratified, the study will not further deal with them.

### 3.3.2.1 Paris Convention<sup>171</sup> and Vienna Convention<sup>172</sup>

As stated above, the Paris Convention and the Vienna Convention are quite similar in their regulations and aims, therefore the study will examine them together. The Paris Convention will be discussed in its version amended by the Additional Protocol of 28 January 1964<sup>173</sup> and by the Protocol of 16 November 1982.<sup>174</sup> This version of the Paris Convention<sup>175</sup> has been in force since 7 October 1988.<sup>176</sup> The 2004 Protocol to Amend the Paris Convention<sup>177</sup> (PC Protocol) and the corresponding 2004 Protocol

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<sup>168</sup> Birnie et al. op cit (n75) 521

<sup>169</sup> Brussels Convention on the Liability of Operators of Nuclear Ships, 25 May 1962, 57 *AJIL* 268

<sup>170</sup> Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material, 17 December 1971, 974 *UNTS* 255

<sup>171</sup> The Paris Convention has currently 16 contracting states. See <https://www.oecd-neo.org/law/multilateral-agreements/paris-convention-third-party-liability.html> accessed on 19 December 2017

<sup>172</sup> The Vienna Convention has currently 40 contracting states. See <https://www.oecd-neo.org/law/multilateral-agreements/vienna-convention-civil-liability.html> accessed on 19 December 2017

<sup>173</sup> Additional Protocol to the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, 28 January 1964, 956 *UNTS* 335

<sup>174</sup> Protocol to Amend the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, as amended by the Additional Protocol of 28 January 1964, 16 November 1982, 1519 *UNTS* 329

<sup>175</sup> see footnote 119

<sup>176</sup> Montjoie op cit (n94) 917; <https://www.oecd-neo.org/law/paris-convention-ratification.html> accessed on 17 December 2017

<sup>177</sup> Protocol to Amend the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, as amended by the Additional Protocol of 28 January 1964 and by the Protocol of 16 Novem-

to Amend the Brussels Convention<sup>178</sup> (BC Protocol) will be discussed separately, as they are not yet in force.<sup>179</sup> The Vienna Convention will be examined in its original version of 21 May 1963, which entered into force on 12 November 1977.<sup>180</sup> As both Conventions were already amended by several protocols, the study will only have a brief look on these regimes.

Both conventions provide strict and exclusive liability of the operator, regardless of its legal status – a private entity or the state –, for damages of accidents occurring at the installation or during the transport of nuclear substances to or from the installation.<sup>181</sup> Compensation must be only provided for personal injury and damage to or loss of property other than the nuclear installation.<sup>182</sup> Exonerations are possible in both conventions, but they are different. The Vienna Convention provides the possibility of exoneration of the operator in case of a serious negligence of one of the persons who are victims of the incident.<sup>183</sup> Such a provision is not contained in the Paris Convention.<sup>184</sup> Nonetheless, both conventions stipulate exonerations in case of an incident as a direct consequence of an armed conflict, hostilities, war, riot or natural disasters of exceptional character (the latter one was later excluded by the Amending Protocols of both Conventions).<sup>185</sup>

Although the liability of the operator is strict, it is limited in time and amount.<sup>186</sup> Both conventions require that claims of compensation for damages must be launched

ber 1982, 12 February 2004, available at [https://www.oecd-nea.org/law/paris\\_convention\\_protocol.pdf](https://www.oecd-nea.org/law/paris_convention_protocol.pdf) accessed on 17 December 2017

<sup>178</sup> Protocol to Amend the Convention of 31 January 1963 Supplementary to the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, as amended by the Additional Protocol of 28 January 1964 and by the Protocol of 16 November 1982, 12 February 2004, available at [https://www.oecd-nea.org/law/brussels\\_supplementary\\_convention.pdf](https://www.oecd-nea.org/law/brussels_supplementary_convention.pdf) accessed on 17 December 2017

<sup>179</sup> see for PC Protocol <https://www.oecd-nea.org/law/multilateral-agreements/protocol-amend-paris-convention-third-party-liability.html> accessed on 17 December 2017; see for BC Protocol <https://www.oecd-nea.org/law/multilateral-agreements/protocol-amend-brussels-supp-convention-third-party-liability.html> accessed on 17 December 2017

<sup>180</sup> <https://www.oecd-nea.org/law/multilateral-agreements/vienna-convention-civil-liability.html> accessed on 19 December 2017

<sup>181</sup> article 3 & 6(a) Paris Convention; article II & IV(1) Vienna Convention; Schwartz op cit (n34) 42; Sands & Peel op cit (n92) 739;

<sup>182</sup> article 3(a) Paris Convention; article I(1)(k) Vienna Convention; Schwartz op cit (n34) 42-43

<sup>183</sup> article IV(2) Vienna Convention; Montjoie op cit (n94) 924

<sup>184</sup> Montjoie op cit (n94) 924

<sup>185</sup> article 9 Paris Convention; article IV(3) Vienna Convention; Montjoie op cit (n94) 924

<sup>186</sup> Schwartz op cit (n34) 43

within ten years of the date of the incident.<sup>187</sup> This is quite interesting, as it is shorter than in normal domestic legislations (30 years).<sup>188</sup> Furthermore, they provide a ‘discovery rule’, which means that claims must be brought to court within two / three years of the time the victims recognised the damage.<sup>189</sup>

Despite the fact that both conventions stipulate limited liability,<sup>190</sup> they are differences between the two conventions regarding the amount of liability. The Paris Convention determines the maximum liability amount of the operator at SDR 15 million<sup>191</sup> and the minimum amount at SDR 5 million.<sup>192</sup> The Vienna Convention only fixes a minimum amount of US Dollar 5 million.<sup>193</sup> The member states of the Paris Convention recognised early that the limits of liability would not be adequate in relation to damages, which can be caused by a nuclear incident. In order to exceed the limit of compensation, the Brussels Convention was adopted to provide additional compensation.<sup>194</sup> The Convention is based on a 3-tier system, which means that compensation is provided through three different funds.<sup>195</sup> Compensation is provided on a first level through the funds of the operator (up to SDR 5 million),<sup>196</sup> followed by public funds of the contracting states (up to SDR 175 million)<sup>197</sup> and finally an international public fund of all contracting states cover amounts up to SDR 300 million.<sup>198</sup>

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<sup>187</sup> article VI(1) Vienna Convention

<sup>188</sup> Montjoie op cit (n94) 924

<sup>189</sup> article 8(c) Paris Convention; article VI(3) Vienna Convention; Schwartz op cit (n34) 43

<sup>190</sup> article 7(a) Paris Convention; article V(1) Vienna Convention

<sup>191</sup> article 7(b) Paris Convention; Special Drawing Rights are a kind of currency mix defined by the International Monetary Fund based on the Euro, the US Dollar, the Japanese Yen and the Pound Sterling. See Schwartz op cit (n34) 43; By 19 December 2017 the exchange rate of the SDR and the EUR was SDR 1 = 1.20 EUR, the exchange rate of the EUR and the US Dollar was EUR 1 = 1.18 US Dollar and the exchange rate of the EUR and the Rand was EUR 1 = R 15. The following conversions are all based on these exchange rates; SDR 15 million are approximately EUR 18 million

<sup>192</sup> article 7(b) Paris Convention, approximately EUR 6 million

<sup>193</sup> article V(1) Vienna Convention, approximately EUR 4.2 million

<sup>194</sup> Schwartz op cit (n34) 43-44

<sup>195</sup> Ibid 44

<sup>196</sup> article 3(2)(1) Brussels Convention, approximately EUR 6 million

<sup>197</sup> article 3(2)(2) Brussels Convention, approximately EUR 210 million

<sup>198</sup> article 3(2)(3) Brussels Convention, approximately EUR 360 million; Schwartz op cit (n34) 44

In terms of jurisdiction, both conventions state the principle that the courts of the contracting party in which the incident took place are applicable for compensation claims.<sup>199</sup>

The Paris Convention only applies to incidents in the territory of a Contracting State,<sup>200</sup> while the text of the Vienna Convention is not clear about this fact and can also be read as being applicable for damages in the territory of a non-signatory state.<sup>201</sup>

Consequently, the comparison of the two main tools of the international nuclear liability regime reveals the general principles of nuclear liability and shows the similarity between the conventions.

### 3.3.2.2 Joint Protocol<sup>202</sup>

This similarity and impracticability of the two parallel convention systems were also recognised by the international community. As a first, fairly quick, response to the Chernobyl accident in 1986, the Joint Protocol was adopted on 21 September 1988 and entered into force on 27 April 1992.<sup>203</sup> Before the adoption of the Joint Protocol, victims in member states of the particular convention could benefit from incidents happened in one of the contracting states of its convention, but were not able to claim compensation, when the accident occurred in a state, which was member to the other convention.<sup>204</sup>

Consequently, the main objective of the Joint Protocol was to outline the victim's right to claim for compensation in any member state, irrespectively to which of the two conventions the state is a member.<sup>205</sup> The Joint Protocol is also applicable to all

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<sup>199</sup> article 13(1) Paris Convention; article XI(1) Vienna Convention; Montjoie op cit (n94) 927

<sup>200</sup> article 2 Paris Convention

<sup>201</sup> Montjoie op cit (n94) 922; other opinion Schwartz op cit (n34) 43, who states that the Vienna Convention is also not applicable in the territory of a non-contracting state

<sup>202</sup> The Joint Protocol has currently 28 contracting states. See <https://www.oecd-neo.org/law/multilateral-agreements/joint-protocol-application-vienna-convention-paris-convention.html> accessed on 19 December 2017

<sup>203</sup> Montjoie op cit (n94) 919

<sup>204</sup> Schwartz op cit (n34) 44

<sup>205</sup> Montjoie op cit (n94) 919

future amendments of the two conventions.<sup>206</sup> In fact, the geographical coverage of nuclear liability was extended.<sup>207</sup> With regard to the Chernobyl accident, the intention was also that the extended application would engage further countries to join the international liability system, especially in East Europe. This would extend the nuclear liability system throughout Europe and would prevent that for accidents like Chernobyl no compensation was provided.<sup>208</sup> However, the result must be seen as disappointing, because only a few states were attracted by the Joint Protocol and the idea of a single liability regime in Europe failed.<sup>209</sup>

### 3.3.2.3 VC Protocol<sup>210</sup>

Despite the lack of compensation following the Chernobyl disaster, the accident also showed the dimension of damage which could be caused by a nuclear incident.<sup>211</sup> The international community had to recognise that more financial compensation needed to be provided and compensation should be available for a larger number of people.<sup>212</sup> As the Joint Protocol could only contribute to the second goal, a ‘further strengthening of the liability regime for nuclear damage [was] essential to the development and use of nuclear energy for peaceful purposes.’<sup>213</sup> Due to these facts the VC Protocol was adopted on 12 September 1997 and entered into force on 4 October 2003.<sup>214</sup> It was the most noteworthy development in the context of nuclear liability law for decades, as it extended the amount of available money, the circle of people and the kind of damage which would be compensated.<sup>215</sup>

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<sup>206</sup> Montjoie op cit (n94) 919

<sup>207</sup> Schwartz op cit (n34) 44-45

<sup>208</sup> Ibid 45

<sup>209</sup> Schwartz op cit (n34) 45

<sup>210</sup> The VC Protocol has currently 13 contracting states. See <https://www.oecd-nea.org/law/multilateral-agreements/protocol-amend-vienna-convention-civil-liability.html> accessed on 19 December 2017

<sup>211</sup> V Lamm ‘The Protocol amending the 1963 Vienna Convention’ (1998) 61 *Nuclear Law Bulletin* 8

<sup>212</sup> Schwartz op cit (n34) 45

<sup>213</sup> Measures to strengthen international co-operation in nuclear safety and radiological protection – Liability for nuclear damage, 23 September 1988, IAEA Doc. GC(XXXII)/RES/491

<sup>214</sup> Montjoie op cit (n94) 918

<sup>215</sup> Schwartz op cit (n34) 48

First of all, the VC Protocol increased the minimum amount of liability from US Dollar 5 million to SDR 300 million.<sup>216</sup> The liability of the operation can be reduced to SDR 150 million, when in return the respective contracting state provides a public fund with the same additional amount.<sup>217</sup> However, the protocol stipulates a transitional period of 15 years starting at the date of the entry into force, where the minimum amount of liability is fixed at SDR 100 million.<sup>218</sup> The protocol does not earmark any maximum of liability, so it allows the states to impose unlimited liability.<sup>219</sup>

The installation of a public fund could be seen as some kind of state liability. The need for which was also considered in the negotiations for the VC Protocol, as it was thought that only the financial resources of states would be able to provide enough compensation for accidents like Chernobyl.<sup>220</sup> In the end, the idea was rejected in favour of a civil liability regime with state liability components like the public fund.<sup>221</sup>

The VC Protocol also clarifies the applicability of the Vienna Convention, as it states that ‘the Convention shall apply to nuclear damage wherever suffered’,<sup>222</sup> followed by some exceptions.<sup>223</sup> This means, more people can invoke the Vienna Convention in terms of compensation.<sup>224</sup> In addition, the VC Protocol gives victims more time to claim compensation for loss of life or personal injury by extending the time limit from ten years to 30 years.<sup>225</sup> Furthermore, it expands the competence of the jurisdiction with adding the exclusive economic zone (EEZ) of a member state to its jurisdiction.<sup>226</sup>

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<sup>216</sup> article V(1)(a) revised Vienna Convention (the Vienna Convention in the edition as amended by the 1997 VC Protocol is referred to as revised Vienna Convention), approximately EUR 360 million

<sup>217</sup> article V(1)(b) revised Vienna Convention, approximately EUR 180 million

<sup>218</sup> article V(1)(c) revised Vienna Convention, approximately EUR 120 million

<sup>219</sup> Schwartz op cit (n34) 47

<sup>220</sup> Lamm op cit (n211) 10; Schwartz op cit (n34)

<sup>221</sup> Schwartz op cit (n34) 46-47

<sup>222</sup> article I A(1) revised Vienna Convention

<sup>223</sup> article I A(2) revised Vienna Convention

<sup>224</sup> Schwartz op cit (n34) 47

<sup>225</sup> article VI(1)(a)(i) revised Vienna Convention

<sup>226</sup> article XI(2) revised Vienna Convention

Another fact, which was recognised after the Chernobyl accident, was the huge damage to the environment and the costs to rehabilitate it.<sup>227</sup> Thus the definition of nuclear damage was refined and extended,<sup>228</sup> by including several new types of damage, such as ‘the costs of measures of reinstatement of impaired environment’,<sup>229</sup> ‘the costs for preventive measures’,<sup>230</sup> but also the compensation for ‘economic loss’<sup>231</sup> was added.

Although it was hoped that the VC Protocol would encourage further states to join the nuclear liability regime or just enhance their liability position of the Vienna Convention through signing and ratifying the protocol, the success of the attempt is minimal with only a few member states, which in addition are mostly no significant nuclear generating countries.<sup>232</sup>

#### 3.3.2.4 Convention on Supplementary Compensation<sup>233</sup>

A further achievement was the adoption of the Convention on Supplementary Compensation, which in the views of some scholars opened ‘a new chapter in international nuclear liability law.’<sup>234</sup> The reason is the fact that the Convention on Supplementary Compensation deals with liability and compensation in a global context, which includes all nuclear energy operating countries as well as countries, which do not generate nuclear energy at all.<sup>235</sup> The convention is a free-standing set of rules open to all states.<sup>236</sup> It imposes mandatory contributions and is applicable to both, trans-boundary damage and damage suffered within the state of a potential accident.<sup>237</sup>

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<sup>227</sup> see chapter 2.3

<sup>228</sup> Lamm op cit (n211) 11-13; Schwartz op cit (n34) 48

<sup>229</sup> article I(1)(k)(iv) revised Vienna Convention

<sup>230</sup> article I(1)(k)(vi) revised Vienna Convention

<sup>231</sup> article I(1)(k)(iii) revised Vienna Convention

<sup>232</sup> Schwartz op cit (n34) 48-49

<sup>233</sup> The Convention on Supplementary Compensation has currently 10 contracting states. See <https://www.oecd-nea.org/law/multilateral-agreements/convention-supp-compensation-nuclear-damage.html> accessed on 19 December 2017

<sup>234</sup> B McRae ‘The Compensation Convention: Path to a Global Regime for Dealing with Legal Liability and Compensation for Nuclear Damage’ in NEA & IAEA *International Nuclear Law in the Post-Chernobyl Period* (2006) 187

<sup>235</sup> Ibid

<sup>236</sup> McRae op cit (n234) 187; Davies op cit (n6) 30

<sup>237</sup> Schwartz op cit (n34) 49; Montjoie op cit (n94) 918

Although it was adopted together with the VC Protocol on 12 September 1997, it only entered into force recently on 15 April 2015.<sup>238</sup>

The convention is open to all states, regardless of their adherence to the Paris or Vienna Convention.<sup>239</sup> However, if they are not party to any of these conventions, the national legislation must be in line with the principles of the two conventions.<sup>240</sup> This should allow the compensation of more people.<sup>241</sup>

The convention is based on a 2-tier system to make more money available for compensation.<sup>242</sup> In a first step, the availability of at least SDR 300 million SDR<sup>243</sup> must be provided, either by the nuclear operator, the nuclear installation state or by a combination of both.<sup>244</sup> The second tier is allocated by an international fund, established through the convention and to which all contracting states have to contribute in case that the damage to be compensated, exceeds the amount provided by the installation state.<sup>245</sup> The compensation should be distributed without any discrimination.<sup>246</sup> An interesting feature is the allocation of the fund. While half of its amount shall be allocated for victims in and outside the installation state, the other half shall only be available for victims outside the installation.<sup>247</sup> This 50-50 rule is a new innovation in nuclear liability law and has been welcomed by several scholars.<sup>248</sup>

The approach of a broader understanding of nuclear damage, including environmental damage, was also set out in the Convention on Supplementary Compensation, which was adopted together with the VC Protocol. Insofar the terms ‘nuclear dam-

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<sup>238</sup> <https://www.oecd-nea.org/law/multilateral-agreements/convention-supp-compensation-nuclear-damage.html> accessed on 19 December 2017

<sup>239</sup> Davies op cit (n6) 30

<sup>240</sup> the principles are stated in the Annex of the Convention on Supplementary Compensation; Schwartz op cit (n34) 50

<sup>241</sup> Schwartz op cit (n34) 50

<sup>242</sup> Schwartz op cit (n34) 50

<sup>243</sup> approximately EUR 360 million

<sup>244</sup> article III(1)(a)(i) Convention on Supplementary Compensation; Davies op cit (n6) 32; Schwartz op cit (n34) 50

<sup>245</sup> article III(1)(b) Convention on Supplementary Compensation; Schwartz op cit (n34) 50

<sup>246</sup> article III(2)(a) & (b) Convention on Supplementary Compensation

<sup>247</sup> article XI(1) Convention on Supplementary Compensation

<sup>248</sup> Schwartz op cit (n34) 50; McRae op cit (n234) 192-193

age' and 'nuclear incident' are defined in the same broad manner as in the VC Protocol.<sup>249</sup>

The Convention on Supplementary Compensation was intended to attract further countries to join the nuclear liability regime, especially countries, which have not been party to any of the two already established systems. However, the success was not that great with only a few contracting states.<sup>250</sup> Nevertheless, in the last years important nuclear generating states, such as the United States, Canada and India became party to the Convention.<sup>251</sup>

### 3.3.2.5 PC Protocol and BC Protocol

The last relevant international treaties are the protocols to amend the Paris Convention and the Brussels Convention. Caused by the far reaching amendments of the VC Protocol, which would also have an impact on the Paris regime through the Joint Protocol, the Paris regime had to be amended as well.<sup>252</sup> The intention of the protocols, similar to the VC Protocol and the Convention on Supplementary Compensation, was to extent the scope of the conventions in terms of the amount of available money, the circle of victims to compensate and the scope of the damage to compensate.<sup>253</sup>

#### 3.3.2.5.1 PC Protocol

The mentioned aims were realised by increasing the minimum liability amount to EUR 700 million<sup>254</sup> in general, for low risk nuclear installation to EUR 70 million<sup>255</sup> and for transport to EUR 80 million.<sup>256</sup> That is exceptional, as it nearly doubles the minimum amount of the VC Protocol and further does not make provisions for a limit of liability. This makes it more compatible with states, which have already im-

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<sup>249</sup> article I(f) & (i) Convention on Supplementary Compensation; Schwartz op cit (n34) 51

<sup>250</sup> Schwartz op cit (n34) 51

<sup>251</sup> WNA op cit (n8)

<sup>252</sup> Schwartz op cit (n34) 52-53

<sup>253</sup> Ibid 53

<sup>254</sup> article 7(a) revised Paris Convention (the Paris Convention in the edition as amended by the 2004 PC Protocol is referred to as revised Paris Convention)

<sup>255</sup> article 7(b)(i) revised Paris Convention

<sup>256</sup> article 7(b)(iI) revised Paris Convention

posed unlimited liability on their nuclear operator (like Germany).<sup>257</sup> Financial security is still required by the nuclear operators, at least the applicable minimum liability amount, and contracting states have to secure payment for claims, which exceed the maximum liability amount of their nuclear operators.<sup>258</sup> A further improvement is the expansion of the scope of the Paris Convention. Originally, compensation was limited to the territory of the contracting states, with a few exceptions.<sup>259</sup> The revised Paris Convention is now applicable to a whole range of further countries.<sup>260</sup> Besides contracting states of the Vienna regime and the Joint Protocol, it also includes countries without nuclear installations or countries with a sufficient national legislation.<sup>261</sup> The prescription period for compensation claims for damage respecting personal injury or death is extended to 30 years.<sup>262</sup> Finally, the revised Paris Convention now includes a definition of ‘nuclear damage’, similar to the definitions in the VC Protocol and the Convention on Supplementary Compensation.<sup>263</sup>

#### 3.3.2.5.2 BC Protocol

The BC Protocol does not change the three-tier compensation system of the Brussels Convention, but increases the liability amounts of each stage significantly.<sup>264</sup> Minimum liability is increased on the first tier to EUR 700 million, on the second tier to EUR 500 million and on the third tier to EUR 300 million,<sup>265</sup> which raises the total amount available for compensation to EUR 1.5 billion.<sup>266</sup> However, the revised Brussels Convention remains applicable only in the territory of contracting states, even if its scope was extended to the EEZ of the respective contracting state.<sup>267</sup> The idea behind this is that the money provided by the revised Brussels Convention is

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<sup>257</sup> Schwartz op cit (n34) 53-54

<sup>258</sup> article 10(a) & (c) revised Paris Convention; Schwartz op cit (n34) 54

<sup>259</sup> R Dussart Desart ‘The reform of the Paris Convention on Third Party Liability in the Field of Nuclear Energy and of the Brussels Supplementary Convention’ (2005) 75 *Nuclear Law Bulletin* 16

<sup>260</sup> Schwartz op cit (n34) 54; Dussarta Desart op cit (n259) 16

<sup>261</sup> article 2(a)(ii)-(iv) revised Paris Convention

<sup>262</sup> article 8(c)(i) revised Paris Convention

<sup>263</sup> article 1(a)(vii) revised Paris Convention

<sup>264</sup> Schwartz op cit (n34) 55

<sup>265</sup> article 3(b) revised Brussels Convention (the Brussels Convention in the edition of the 2004 BC Protocol is referred to as revised Brussels Convention)

<sup>266</sup> Dussart Desart op cit (n259) 21; Schwartz op cit (n34) 55

<sup>267</sup> article 2(a)(i) & (iii) revised Brussels Convention

mainly funded by public resources and should therefore only be used to compensate victims in the contracting states.<sup>268</sup>

As already mentioned above, the Paris regime, including the PC and BC Protocol is only open to OECD member states, unless all contracting states agree to the admission of a non-OECD member state, as it was agreed on for Slovenia in 2001.<sup>269</sup> Neither the PC Protocol nor the BC Protocol have yet entered into force,<sup>270</sup> although several countries have already aligned their national legislation to the provisions of the revised Conventions (such as Germany). However, it can be assumed that the protocols will enter into force soon.<sup>271</sup>

### 3.3.2.6 Assessment and outlook on the future of the conventions

As illustrated above, the international nuclear liability system is based on two pillars, which are concurring, even though they represent the same core principles. The adoption of the Convention on Supplementary Compensation involved a third player, which perhaps was intended to connect the two systems, but indeed created a further competition between the liability regimes.<sup>272</sup> The problem of the concurrent system is especially significant, when it comes to the use of public funds for compensation. The revised Brussels Convention therefore includes a progressive regulation in article 14(d) revised Brussels Convention, which allows the contracting states to use the money from the public funds to satisfy obligations arising by virtue of other international agreements, with the specific reference to the Convention on Supplementary Compensation.<sup>273</sup>

The future of these conventions is contentious. Suggestions were made for a universal system, which would cover all relevant states and provisions concerning nuclear

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<sup>268</sup> Schwartz op cit (n34) 55

<sup>269</sup> Schwartz op cit (n34) 56

<sup>270</sup> <https://www.oecd-nea.org/law/multilateral-agreements/protocol-amend-paris-convention-third-party-liability.html> accessed on 23 November 2017; <https://www.oecd-nea.org/law/multilateral-agreements/protocol-amend-brussels-supp-convention-third-party-liability.html> accessed on 23 November 2017

<sup>271</sup> Schwartz op cit (n34) 56

<sup>272</sup> Montjoie op cit (n94) 919

<sup>273</sup> article 14(d) revised Brussels Convention; Montjoie op cit (n94) 919

safety,<sup>274</sup> but also for a convention dealing specifically with state responsibility in the context of nuclear liability.<sup>275</sup> The latter approach was accused to be ineffective<sup>276</sup> and although the ideas were appreciated in general, they could not find enough support amongst the international community.<sup>277</sup>

Apart from this, the provided international nuclear regimes remain imperfect.<sup>278</sup> Three significant problems should be outlined. The first one is the required financial security of the nuclear operators. Despite the fact that it is desirable to increase the operators' liability amounts, it remains unclear, if they are able to meet these requirements.<sup>279</sup> Generally, financial security is provided through appropriate insurances. The insurers made several announcements that they would not be able to provide adequate insurances, such as for the full 30-year prescription duration, for the damages especially related to environmental damages and preventive measures or for risks arising from terrorist attacks.<sup>280</sup>

A further problem is the question concerning on-site damages. These damages are excluded by all conventions due to the intention that the nuclear operator should not use the provided financial security for its own damages at the expense of third parties.<sup>281</sup> Although the argument is favourable, it poses the question if nuclear operators could claim for their own damages against negligent suppliers. While one view denies this with regard to the principle of exclusive liability of the operator, another view affirms the possibility of compensation. Its argument is that these kind of damages fall outside of the scope of the conventions, which makes them recoverable under ordinary civil law.<sup>282</sup> The conventions should clarify this question.

Finally, the most distressing issue probably is the lack of contracting states to all conventions. Currently, by 2014 249 of 435 nuclear reactors were located in coun-

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<sup>274</sup> L de la Fayette 'Towards a New Regime of State Responsibility for Nuclear Activities' (1992) 50 *Nuclear Law Bulletin* 7

<sup>275</sup> de la Fayette op cit (n274) 7; Montjoie op cit (n94) 919; Birnie et al. op cit (n75) 519

<sup>276</sup> P Strohl & N Pelzer *The Hazards Arising out of the Peaceful Use of Nuclear Energy* (1993) 273

<sup>277</sup> Montjoie op cit (n94) 919

<sup>278</sup> Schwartz op cit (n34) 60

<sup>279</sup> Ibid

<sup>280</sup> Schwartz op cit (n34) 60-61

<sup>281</sup> Ibid 61

<sup>282</sup> Ibid 61-62

tries, which are not party to any international nuclear liability agreement.<sup>283</sup> South Africa is one of these countries. Some of the countries do not even provide any specific domestic legislation regarding nuclear liability, such as Pakistan or the Islamic Republic of Iran.<sup>284</sup> Nuclear incidents occurring in any of the non-convention states put victims, regardless of damage suffered inside or outside the country, in a precarious situation in terms of claiming damages.<sup>285</sup> They are left with issues regarding the principle right to sue compensation, but also with problems of burden of proof or the amount of available compensation, which is solved by the existing conventions.<sup>286</sup> One explanation for this irresponsibility is given by *Schwartz*, who suggests, that the system of 'limited liability', laid down in the nuclear liability regimes, might be a reason for countries not to join the regime, because they want to provide unlimited compensation for victims.<sup>287</sup> The author of this study, who places the intentions of the non-contracting states more in the area of preventing liability and the lack of willingness to impose stricter regulations on the nuclear industry due to political reasons highly doubts this argument. Furthermore, the system of 'limited liability' is more or less abrogated by the latest PC Protocol and the case of Germany shows that implementation of an unlimited liability regime is also possible within the Paris Convention system (see below). The last argument is also acknowledged by *Schwartz*.<sup>288</sup> Further consistent reasons are the regional scope of the Conventions, especially the Paris regime, or if countries are geographically too remote to benefit from the liability regime.<sup>289</sup> However, further incentives must be made for these countries to sign and ratify the conventions and protocols. This is only possible by accompanying states which are interested and helping them to adapt their domestic legal framework. This should be supported by a strong cooperation of NEA and IAEA.<sup>290</sup>

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<sup>283</sup> Davies op cit(n6); this figure is not up to date, as especially the USA and Japan have recently joined the Convention on Supplementary Compensation

<sup>284</sup> Schwartz op cit (n34) 58

<sup>285</sup> Ibid

<sup>286</sup> Ibid

<sup>287</sup> Ibid 59

<sup>288</sup> Schwartz op cit (n34) 59

<sup>289</sup> Ibid 63

<sup>290</sup> Ibid 62-63

Nevertheless, it will be interesting to examine in chapter 5 the intention and reasons of South Africa not adhering to any international nuclear liability agreement by assessing its legal nuclear liability framework.

### **3.4 Conclusion**

As seen above, the international framework of nuclear liability is an ongoing process. It reacts to events occurring related to nuclear liability. The reactions to the Chernobyl accident can illustratively be read from the development of the international nuclear liability regime. It will be interesting, how the international community will react to the Fukushima accident and to the further demand and establishment of nuclear energy reactors. This discussion is already conducted amongst legal scholars.<sup>291</sup> The findings to the classification of nuclear liability in international law and the international principles of nuclear liability should be borne in mind for the following assessment of the domestic nuclear liability frameworks.

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<sup>291</sup> see RJ Heffron et al. 'The global nuclear liability regime post Fukushima Daiichi' (2016) 90 *Progress in Nuclear Energy* 1-10

## Chapter 4 – German nuclear liability regime

### 4.1 Introduction

Germany has always had and still has a special relationship with nuclear energy. When it comes to environmental movements in Germany, the first association is Greenpeace and its most important topic, the resistance to nuclear energy. In no other country was the environmental movement focused on the topic of the civilian use of nuclear energy to such an extent and for such a long period of time as in Germany.<sup>292</sup> This eternal dispute finally resulted in the decision of the German government to stop the nuclear energy programme after the Fukushima accident by taking the last two power plants from the grid by the end of 2022.<sup>293</sup>

However, not only this discussion has always been of significant interest for the international nuclear community, but also the German nuclear liability framework has gathered particular attention, as it is outstanding by providing more or less the highest standards compared to other nuclear liability frameworks.<sup>294</sup> Unlimited liability, an unlimited territorial scope and the highest financial security provisions of any Paris Convention state are part of the German nuclear liability framework.<sup>295</sup> That makes it so interesting for a comparison with the South African legal framework for nuclear liability.

Germany, as an OECD member state, is part of the Paris Convention system. For implementing the Paris Convention and its principles, it has chosen to adopt the convention in its entirety. This means that instead of adopting a new domestic act, the German legislator transposed the text of the Paris Convention literally into binding German domestic law.<sup>296</sup> Furthermore, it stretched the Paris Convention to its very

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<sup>292</sup> J Roose ‘Der endlose Streit um die Atomenergie. Konfliktsoziologische Untersuchung einer dauerhaften Auseinandersetzung’ in P Feindt & T Saretzki *Umwelt- und Technikkonflikte* (2010) 79

<sup>293</sup> Mann op cit (n5) 51-52

<sup>294</sup> Raetzke op cit (n5) 9

<sup>295</sup> Ibid

<sup>296</sup> Ibid

limits, by making use of all options and margins the system provides for the national legislators and by going beyond this with several reservations to the Convention.<sup>297</sup>

The aim behind this approach is, firstly, to shift the above mentioned balance of the nuclear industry and the potential victims of a nuclear accident towards the latter ones and, secondly, to narrow the gap between ordinary law of delict and nuclear liability law as much as possible.<sup>298</sup>

To get a better understanding of the German legal framework for nuclear liability and its structure, the study will give a brief overview about the history of German nuclear liability legislation, before outlining the elements of German nuclear liability law and assessing it.

#### **4.2 History of German nuclear liability**

The first regulations concerned with nuclear liability could be found in the *Atomgesetz*<sup>299</sup> (Atomic Energy Act) which was promulgated in 1959.<sup>300</sup> It included a chapter dealing with liability issues, independent from the Paris Convention, which was adopted in 1960. A special feature was the channelling of liability in an economic manner to the operator, instead of a legal manner as in the Paris Convention. Furthermore, the limit of liability was DM 500 million (approximately EUR 250 million) then, which was far beyond the limit of the Paris Convention.<sup>301</sup> As the *Atomgesetz* fitted much better in ordinary law of delict and provided a higher liability standard, huge discussions about the ratification of the Paris Convention erupted in Germany. However, Germany finally ratified the Paris Convention and the Brussels Convention in 1975 and transferred the wording of the Paris Convention literally into

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<sup>297</sup> Germany has signed four of the five reservations listed in Annex I of the Paris Convention, but only made use of two of them. See Raetzke op cit (n5) 9

<sup>298</sup> Raetzke op cit (n5) 10

<sup>299</sup> Bundesgesetzblatt 1985 I 1565; an unofficial translation can be found at <http://extwprlegs1.fao.org/docs/pdf/ger50913E.pdf> accessed on 17 December 2017; the study refers to the *Atomgesetz* in its current edition in force; to the original version of 1959 it refers to as *Atomgesetz* 1959 and to the version including the Amendment of 2008, which is not yet in force, it refers to as revised *Atomgesetz*

<sup>300</sup> Raetzke op cit (n5) 10

<sup>301</sup> Raetzke op cit (n5) 10; the original maximum limit of the Paris Convention was SDR 15 million, see chapter 3.3.2.1

German legislation.<sup>302</sup> In this context, the German nuclear liability legislation was also brought in line with the provisions of the Paris Convention.<sup>303</sup> The next important step was the abrogation of limited liability in 1985.<sup>304</sup> Since this time the liability of nuclear operators is unlimited. In 1998, the national government was built by a coalition, which had a negative attitude against the use of nuclear energy. This culminated in the first legislation concerned with phasing-out of nuclear energy in 2002.<sup>305</sup> In the context of this amendment of the *Atomgesetz*, the maximum amount for financial security was raised to EUR 2.5 billion, paired with a new system to secure the availability of this money, namely a pooling system.<sup>306</sup>

The last important amendment was promulgated in 2008,<sup>307</sup> in order to align the German legislation with the 2004 PC Protocol. The amendment will become effective, as soon as the PC Protocol will enter into force.<sup>308</sup> Due to the fact that the current German legislation already includes most of the amendments of the PC Protocol, its pending status does not have that much impact on Germany – compared to other contracting states – and will not bring essential changes to the German nuclear liability framework.<sup>309</sup>

### 4.3 Elements of German nuclear liability

The German nuclear liability regime is based on two pillars, namely the Paris Convention and the *Atomgesetz*, which supplements the Paris Convention. The *Atomgesetz* thereby regulates issues, which are left to the discretion of the contracting states by the Paris Convention and even modifies the convention at particular points.<sup>310</sup> This will be outlined later.

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<sup>302</sup> Bundesgesetzblatt 1975 II, 957; Raetzke op cit (n5) 10-11

<sup>303</sup> Bundesgesetzblatt 1975 I 1885

<sup>304</sup> Bundesgesetzblatt 1985 I 781

<sup>305</sup> Bundesgesetzblatt 2002 I 1351

<sup>306</sup> Raetzke op cit (n5) 11

<sup>307</sup> Bundesgesetzblatt 2008 I 1793

<sup>308</sup> article 5 revised *Atomgesetz*

<sup>309</sup> OECD & NEA *Nuclear Legislation in OECD and NEA Countries* (2011) available at <https://www.oecd-nea.org/law/legislation/germany.pdf> accessed on 17 December 2017 21; Raetzke op cit (n5) 12

<sup>310</sup> T Keich 'Die Haftung für Risiken aus dem Betrieb einer Kernanlage – Eine Bestandsaufnahme des deutschen Rechts' (2011) 33 *Natur und Recht* 481; Raetzke op cit (n5) 12

The process of implementing the Paris Convention into German domestic law consisted of the promulgation of an act of the *Bundestag* (German Parliament) in line with the *Grundgesetz* (German Constitution), which in fact includes the consent of the parliament to implement the Paris Convention and the original convention text of 1960 plus the text of the amendment of 1964.<sup>311</sup> Similar procedures took place for the amendment protocol of 1982<sup>312</sup> and the PC Protocol of 2004,<sup>313</sup> while the latter one is still pending.<sup>314</sup> This was possible, because the Paris Convention is regarded as self-executive.<sup>315</sup>

Despite its self-executive character, the Paris Convention leaves options and margins for the contracting state, either deliberately to specify certain provisions, such as the amount of the liability limit, or to develop general aspects, such as the process for a claim for compensation.<sup>316</sup> As there is no particular act for nuclear liability in Germany, this task is undertaken by the *Atomgesetz*. Bearing in mind that the act was adopted in advance of the Paris Convention, the structure is not aligned to the convention, which makes it more difficult to read both statutes alongside with each other.<sup>317</sup> However, the most important sections concerning liability could be found in chapter 4 *Haftungsvorschriften* (liability provisions) and therein particular in the sections 25-40 *Atomgesetz*, paired with several other provisions in the act.<sup>318</sup> The supplementary character of the *Atomgesetz* could be read from section 25(1) *Atomgesetz*, which states that the provisions of the act apply complementary to the Paris Convention.<sup>319</sup> Further cases of nuclear liability outside the Paris Convention system are regulated in section 25(a) *Atomgesetz* for nuclear ships and in section 26 *Atomgesetz*, which is a catch-all provisions for radiation-related damage.<sup>320</sup> In terms of the out-

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<sup>311</sup> Bundesgesetzblatt 1975 II 957

<sup>312</sup> Bundesgesetzblatt 1985 II 690

<sup>313</sup> Bundesgesetzblatt 2008 II 902

<sup>314</sup> Raetzke op cit (n5) 12

<sup>315</sup> Ibid

<sup>316</sup> N Pelzer 'Conflicts of Laws Issues under the International Nuclear Liability Conventions' in JF Baur et al. *Festschrift für Gunther Kühne zum 70. Geburtstag* (2009) 824-828; Raetzke op cit (n5) 12-13

<sup>317</sup> Raetzke op cit (n5) 13

<sup>318</sup> G Kühne 'Haftung bei grenzüberschreitenden Schäden aus Kernreaktorunfällen' (1986) *Neue Juristische Wochenschrift* 2139; OECD & NEA op cit (n309) 20

<sup>319</sup> Kühne op cit (n318) 2139; Raetzke op cit (n5) 13

<sup>320</sup> OECD & NEA op cit (n309) 21; Raetzke op cit (n5) 13; Keich op cit (n310) 481

lined international nuclear liability regime it must be mentioned that Germany is also party to the Brussels Convention and the Joint Protocol.<sup>321</sup>

Another important, but rather general act, which contains specific regulations concerning the nature and extent of compensation is the *Bürgerliches Gesetzbuch* (German Civil Code),<sup>322</sup> which will be covered in more detail later.

#### 4.3.1 Strict liability

As mentioned above, article 3 and 4 Paris Convention impose strict liability on the operator of a nuclear installation. These provisions are unrestrictedly applicable in Germany.<sup>323</sup> The concept of strict liability (in German: *Gefährdungshaftung*) is not alien to German civil law, as it has been an element of it since the 19<sup>th</sup> century and was originally applicable for railway operators and later for other industrial sectors.<sup>324</sup> Furthermore, the concept of strict liability can be already found in the *Atomgesetz* 1959,<sup>325</sup> which shows that the principle of strict liability fits well with German domestic law.<sup>326</sup>

#### 4.3.2 Exclusive liability

The channelling of liability exclusively to the operator of the nuclear installation could also be found in the German domestic law, as outlined in article 6 Paris Convention.<sup>327</sup> According to the Paris Convention the operator is thereby ‘the person designated or recognised by the competent public authority as the operator of that installation.’<sup>328</sup> The expression ‘operator’ can be also found in section 17(6) *Atomgesetz*. The provision stipulates that the licence authority must outline in any licence for the operation of a nuclear installation that ‘the licence holder is the operator as defined by the [Paris Convention.]’<sup>329</sup> The idea behind this provision is to bring the general German nuclear energy law in line with the provisions of the Paris Conven-

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<sup>321</sup> OECD & NEA op cit (n309) 20;

<sup>322</sup> Raetzke op cit (n5) 13

<sup>323</sup> Keich op cit (n310) 481

<sup>324</sup> Raetzke op cit (n5) 14

<sup>325</sup> H Fischerhof et al. *Deutsches Atomgesetz, und Strahlenschutzrecht, Kommentar* (1962) 354-356

<sup>326</sup> Raetzke op cit (n5) 14

<sup>327</sup> Keich op cit (n310) 482

<sup>328</sup> article 1(a)(vi) Paris Convention

<sup>329</sup> Raetzke op cit (n5) 14

tion. Insofar the term ‘operator’ is only used for formal purposes, while in reality the licence holder is the crucial and responsible person or company in Germany in terms of nuclear liability.<sup>330</sup> This intention could be also read from section 25(2) *Atomgesetz*, which – according to article 4(d) Paris Convention – allows the transmission of liability to a carrier, if he or she assumed the nuclear liability through contraction.<sup>331</sup> In this case, the carrier is regarded as the operator of the nuclear installation.<sup>332</sup>

As already outlined above, this exclusive legal liability approach was not part of German law before it ratified the Paris Convention; instead the *Atomgesetz* 1959 provided the concept of economic channelling of liability.<sup>333</sup> The first approach was to maintain this idea, which can be read from Germany’s reservation to the Paris Convention at the time of signature.<sup>334</sup> The reservation states ‘the right to provide, by national law that persons other than the operator may continue to be liable for damage caused by a nuclear incident.’<sup>335</sup> In the following this intention was changed due to two main arguments. Firstly, the legal channelling of liability would be simpler and would prevent complicated cross liability of different entities. Secondly, it would also facilitate the sector of insurance, as only one person or company would be obliged to maintain liability insurance.<sup>336</sup> Due to these arguments, Germany did not make use of its reservation by the time of ratification of the Paris Convention and abrogated the contradicting section in the *Atomgesetz*.<sup>337</sup>

#### 4.3.3 Exoneration of liability

As mentioned above, the Paris Convention provides exoneration in several cases of liability in article 9 Paris Convention. This procedure is typically in strict liability regimes, especially for *force majeure* cases due to the extent of the liability.<sup>338</sup> The exoneration of the Paris Convention include ‘an act of armed conflict, hostilities,

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<sup>330</sup> Keich op cit (n310) 482

<sup>331</sup> Raetzke op cit (n5) 16

<sup>332</sup> section 25(2) *Atomgesetz*

<sup>333</sup> section 33 *Atomgesetz* 1959; Raetzke op cit (n5) 15

<sup>334</sup> Raetzke op cit (n5) 15

<sup>335</sup> reservation no. 1 Annex I Paris Convention

<sup>336</sup> Raetzke op cit (n5) 15

<sup>337</sup> Ibid

<sup>338</sup> Keich op cit (n310) 481

civil war, insurrection or (...) a grave natural disaster of an exceptional character.’<sup>339</sup> Consequently, the liability in the case of the Fukushima accident would be excluded in terms of the Paris Convention.<sup>340</sup> Nevertheless the category ‘grave natural disaster of an exceptional character’ was abrogated by the 2004 PC Protocol.<sup>341</sup>

The German liability framework completely excludes these exonerations. According to section 25(3) *Atomgesetz*, the provision of article 9 Paris Convention is not applicable in German law. The provision is secured by a reservation to the Paris Convention.<sup>342</sup> This approach is quite untypical, as exonerations are usual for strict liability regimes,<sup>343</sup> but then again it is a proof of the comprehensive German nuclear liability framework.

However, the applicability of this provision is confined in two manners.<sup>344</sup> If the damage occurs in another country, compensation is only provided, when the other country has a similar provision like section 25(3) *Atomgesetz*.<sup>345</sup> Furthermore, in the cases of article 9 Paris Convention, the liability is limited to EUR 2.5 billion.<sup>346</sup>

#### 4.3.4 Damage to be compensated

The damage to be compensated is defined by section 3(a) Paris Convention, which outlines the liability of the operator for ‘damage to or loss of life of any person’ and ‘damage to or loss of any property’.<sup>347</sup> As these terms are quite vague, they are further developed by national legislation, particularly through section 28-30 *Atomgesetz* and in a non-nuclear-specific manner through the German Civil Code, the *Bürgerliches Gesetzbuch*, which is supplemented and further defined by German legal literature and a wide variety of court judgments.<sup>348</sup> The compensation regime of the *Bür-*

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<sup>339</sup> article 9 Paris Convention

<sup>340</sup> Keich op cit (n310) 481

<sup>341</sup> article 9 revised Paris Convention

<sup>342</sup> reservation no. 4 Annex I Paris Convention

<sup>343</sup> Keich op cit (n310) 481

<sup>344</sup> Raetzke op cit (n5) 16

<sup>345</sup> section 25(3) *Atomgesetz*; OECD & NEA op cit (n309) 21

<sup>346</sup> section 31(1) *Atomgesetz* in conjunction with section 34(1) *Atomgesetz*; OECD & NEA op cit (n309) 21

<sup>347</sup> section 3(a) Paris Convention

<sup>348</sup> Keich op cit (n310) 482; Raetzke op cit (n5) 17

*gerliches Gesetzbuch* includes the notion of full compensation<sup>349</sup> and compensation for immaterial damage.<sup>350</sup> Despite the fact that German law also covers consequential financial loss, purely financial loss could not be claimed under German law.<sup>351</sup> Furthermore, a provision for prioritisation of specific compensation, like in other member states of the Paris Convention, such as for the loss of life or personal injury does not exist in German law.<sup>352</sup>

With article 1(a)(vii)(3)-(6) revised Paris Convention, further categories of nuclear damage are introduced in the international nuclear liability regime. In addition to the installation of consequential financial loss<sup>353</sup> and compensation for preventive measures<sup>354</sup>, compensation for environmental damage is included in the revised Paris Convention. This compensation includes ‘the costs of measures of reinstatement of impaired environment’<sup>355</sup> and ‘loss of income deriving from a direct economic interest in any use or enjoyment of the environment’<sup>356</sup>.

While the corresponding amendment in German law is silent about these new categories, the question arises how they should be implemented in the domestic law. The two categories of consequential financial loss and compensation for preventive measures are already covered by the general compensation provision of section 249(1) *Bürgerliches Gesetzbuch*.<sup>357</sup> Regarding the categories attached to environmental damages, it would be the task of the German courts to examine, if the general rules of the *Bürgerliches Gesetzbuch* can be stretched to such an extent.<sup>358</sup> In the opinion of *Raetzke* the German framework already includes these categories of damage in its current legislation. His argumentation is based on the fact that nearly all parts of the environment in Germany are attached to persons by ownership or similar rights and, thus, these persons have a right to claim compensation. This approach is supported by the argumentation that the 2004 PC Protocol only introduced environ-

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<sup>349</sup> section 249(1) *Bürgerliches Gesetzbuch*

<sup>350</sup> section 253(2) *Bürgerliches Gesetzbuch* in conjunction with section 29(2) *Atomgesetz*

<sup>351</sup> *Raetzke* op cit (n5) 17; to read further *Kühne* op cit (n318) 2143-2145

<sup>352</sup> *Raetzke* op cit (n5) 17-18

<sup>353</sup> article 1(a)(vii)(3) revised Paris Convention

<sup>354</sup> article 1(a)(vii)(6) revised Paris Convention

<sup>355</sup> article 1(a)(vii)(4) revised Paris Convention

<sup>356</sup> article 1(a)(vii)(5) revised Paris Convention

<sup>357</sup> *Raetzke* op cit (n5) 19

<sup>358</sup> *Ibid*

mental damages under private law attributed to individual victims and precisely not the environment as a common asset of the general public.<sup>359</sup>

Collectively, German law provides a comprehensive range of damages to be compensated in accordance with the stipulations of the Paris Convention and the 2004 PC Protocol. The compensation for environmental damage must be highlighted in this context, although it does not include environment in a general sense, rather only in conjunction with damages of individuals.

#### 4.3.5 Nature and amount of liability

The probably most interesting and unique tool of the German nuclear liability framework are the regulations concerning the amount of liability.

##### 4.3.5.1 General – the principle of unlimited liability

As already mentioned above, Germany introduced the concept of unlimited liability in 1985 by rewriting section 31(1) *Atomgesetz*. The section nowadays simply outlines that the liability of the operator is unlimited.<sup>360</sup> This means that the operator bears liability after all compensation possibilities, such as the mandatory financial security, state funds and the funds of the Brussels Convention, are exhausted until its insolvency.<sup>361</sup> This provision is contradictory to the regulations of the Paris Convention, which stipulate a limited liability with a maximum amount of SDR 15 million.<sup>362</sup> This conflict was also considered by the drafters of the amendment of the *Atomgesetz*, but they interpreted the provisions of the Paris Convention in a broader way and not as irrefutable. Indeed, the provisions require more consistency between the amount of liability and the financial security.<sup>363</sup> Due to this argumentation the unlimited liability was implemented in German law and the other contracting parties, even though they were not convinced, ultimately accepted the unlimited liability sys-

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<sup>359</sup> N Pelzer ‘Deliberations on Compensation and Remediation of Nuclear Damage to the Environment’ (2011) 86 *Nuclear Law Bulletin* 53-54

<sup>360</sup> section 31(1) *Atomgesetz*

<sup>361</sup> Raetzke op cit (n5) 20

<sup>362</sup> approximately EUR 18 million; article 7(b) Paris Convention

<sup>363</sup> see the Parliament Bill for the 1985 Amendment: Entwurf eines Gesetzes zur Änderung des Atomgesetzes, 25 October 1984, Bundestagsdrucksache 10/2200 5; Raetzke op cit (n5) 20

tem in Germany as a *fait accompli*, which could not be changed anyway.<sup>364</sup> This decision by Germany could probably be seen as the door opener for a new development of liability, as it queried the principle of limited liability which had been uncontested till then.<sup>365</sup>

The decision was endorsed by several arguments. After the nuclear industry was developed and matured, one could not see a reason for still privileging the industry in contrast to ordinary law of delict.<sup>366</sup> It was also recognized that a strict liability does not mandatorily entail limited liability.<sup>367</sup> A further argument was derived from the most important court ruling of the German Constitutional Court concerning the use of nuclear energy. It states that through the provisions of the *Atomgesetz*, mainly section 7(2) *Atomgesetz*,<sup>368</sup> the licencing of a nuclear installation can only be permitted, if the risk of damages to life, health and property is practically excluded.<sup>369</sup> Insofar it would be inconsistent, if the licence for a nuclear installation required practically no residual risks of damage, but at the same time the liability for such a theoretical risk should be limited.<sup>370</sup> And finally, the concept of unlimited liability benefits potential victims of an accident.<sup>371</sup>

However, this discussion will become redundant, when the 2004 PC Protocol will enter into force, which increases the minimum liability amount significantly to EUR 700 million and does not stipulate anymore a maximum amount of liability,<sup>372</sup> thus it includes the concept of unlimited liability.

#### 4.3.5.2 Damage outside of Germany – the principle of reciprocity

The German liability provisions apply regardless of the place, thus they can be applied everywhere. This is stated by section 25(4) *Atomgesetz*, which coincidentally

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<sup>364</sup> N Pelzer ‘The NEA Nuclear Law Committee – from the viewpoint of a Committee Member’ (2007) *Colloquium on the Past, Present and Future of the Nuclear Law Committee* 46

<sup>365</sup> Pelzer op cit (n359) 46

<sup>366</sup> Raetzke op cit (n5) 21

<sup>367</sup> N Pelzer *Begrenzte und unbegrenzte Haftung im deutschen Atomrecht* (1982) 34-36

<sup>368</sup> the section includes the requirement that all necessary preventive measures of the state of the art against damages have to be taken into account before granting a nuclear licence

<sup>369</sup> BVerfG Beschluss vom 8.8.1978 – 2 BvL 8/77 NJW 1979 363; C Raetzke ‘Nuclear law and environmental law in the licensing of nuclear installations’ (2013) 92 *Nuclear Law Bulletin* 59

<sup>370</sup> Raetzke op cit (n5) 21-22

<sup>371</sup> *Ibid* 22

<sup>372</sup> article 7(a) revised Paris Convention

declares article 2 Paris Convention as not applicable. Although this might sound quite excessive and suggests unlimited liability for people who suffered damage outside of Germany, the provision must be read together with section 31(2) *Atomgesetz*.<sup>373</sup> This provision restricts the concept of unlimited liability of section 31(1) *Atomgesetz* through installing a reciprocity clause, which limits the liability of a German operator for damage of victims located in another country to the amount that would be provided by the other country for German victims in the equal scenario.<sup>374</sup> Section 31(2) *Atomgesetz* thereby differentiates between three types of states. The first type of state also provides unlimited liability for German victims; in this case the foreign victims would benefit from the German unlimited liability.<sup>375</sup> The second type of state (the majority of European states) has a limited liability regime in place for German victims; for victims from these states Germany provides the equal amount of compensation. It is significant in this context that resources from supplementary funds, such as the Brussels Convention, are incorporated; hence the amount for contracting states of the Brussels Convention is at least SDR 300 million (EUR 1.5 billion under the revised 2004 BC Protocol).<sup>376</sup> Finally, the liability amount for victims from states without any nuclear installation is linked to the maximum amount of the Brussels Convention, actually SDR 300 million.<sup>377</sup>

The introduction of this legislation was critically regarded by other contracting states with reference to the non-discrimination rule of article 14 Paris Convention. However, the German government argued against these reservations with regard to the *do ut des* principle, which embodies an equal and non-discrimination treatment.<sup>378</sup> In addition, despite the fact that the reciprocity clause limits the liability of German operators, they have to provide more compensation than their counterpart. Reasons for that are the lower threshold of the Brussels Convention, but also the fact that German operators have to compensate the full amount measured by section 31(2) *Atomgesetz*

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<sup>373</sup> Raetzke op cit (n5) 22

<sup>374</sup> Keich op cit (n310) 483; Raetzke op cit (n5) 22-23; to read further C Raetzke 'Haftung deutscher Betreiber für Auslandsschäden: Das Gegenseitigkeitsprinzip des § 31 Abs. 2 AtG' in C Raetzke et al. *Aus der Werkstatt des Nuklearrechts* (2016) 331-358

<sup>375</sup> section 31(2) *Atomgesetz*; Raetzke op cit (n5) 23

<sup>376</sup> section 31(2) *Atomgesetz*; Raetzke op cit (n5) 23

<sup>377</sup> section 31(2) *Atomgesetz*; Raetzke op cit (n5) 23

<sup>378</sup> Raetzke op cit (n5) 24

for damage outside of Germany, while the potential German victims would only benefit from a share of the already limited liability of the foreign operator.<sup>379</sup>

#### 4.3.6 Financially secured liability

Due to the fact that the liability is only effective if it is sufficiently secured, the relevant legislation requires financial liability cover.<sup>380</sup> The Paris Convention therefore offers two possibilities: the maintenance of insurance or other financial security.<sup>381</sup> While normally the amount of financially secured liability is linked to the maximum amount of liability,<sup>382</sup> a certain amount of financial security must be determined and even the revised Paris Convention stipulates for unlimited liability regime, the necessity of the establishment of a limit of financial security provided by the operator.<sup>383</sup> The liability cover in Germany is regulated in section 13 *Atomgesetz*, which requires an amount of EUR 2.5 billion.<sup>384</sup> The security system consists of a range of instruments, consisting of mandatory insurance, other financial security in the form of the Solidarity Agreement, and – where necessary – further state indemnification.

The requirements for financial security are further outlined in the *Atomrechtliche Deckungsvorsorge-Verordnung*<sup>385</sup> (Financial Security Ordinance), which was established in accordance with section 13(3) *Atomgesetz*.<sup>386</sup> It includes detailed regulations about the determination of the financial security (by outlining both possibilities of mandatory insurance or other financial security<sup>387</sup>), which is established for every nuclear installation separately, while all commercial reactors in Germany reach the upper threshold of EUR 2.5 billion.<sup>388</sup> The calculated amount is laid down in the nuclear licence and is reviewed every two years.<sup>389</sup> The operators have to raise the financial security and have to be able to demonstrate this, as otherwise the licence

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<sup>379</sup> Raetzke op cit (n5) 24

<sup>380</sup> Keich op cit (n310) 483

<sup>381</sup> section 10(a) Paris Convention; Keich op cit (n310) 483

<sup>382</sup> section 10(a) Paris Convention

<sup>383</sup> section 10(b) revised Paris Convention; Keich op cit (n310) 483

<sup>384</sup> section 13(3) *Atomgesetz*

<sup>385</sup> Bundesgesetzblatt 1977 I 220

<sup>386</sup> Raetzke op cit (n5) 25

<sup>387</sup> section 2 & 3 Atomrechtliche Deckungsvorsorge-Verordnung

<sup>388</sup> section 9 Atomrechtliche Deckungsvorsorge-Verordnung ; Raetzke op cit (n5) 25

<sup>389</sup> section 13(1) *Atomgesetz*; Raetzke op cit (n5) 26

shall be withdrawn.<sup>390</sup> A further important provision stipulates that no direct legal action against the insurer is possible.<sup>391</sup>

The financial security was originally covered by a special pooling system created by the German insurance sector, the *Deutsche Kernreaktor Versicherungsgemeinschaft*, (DKVG) in Cologne, founded in 1957.<sup>392</sup> As the amount of financial cover was raised from DM 500 million (approximately EUR 256 million) to EUR 2.5 billion in 2002, a new pooling system had to be established, because the new threshold was far beyond any insurance amount available on the market. This was realised through the already mentioned so called *Solidarvereinbarung*<sup>393</sup> (Solidarity Agreement) between the four German energy providers, which operate all commercial nuclear power plants in Germany.<sup>394</sup> The agreement establishes a two-tier system. The first tier entails the existing insurance of EUR 256 million, while the second tier contains the residual amount of EUR 2.244 billion, provided by all four parties, composed through a specific calculation code according to their respective share of the reactors in Germany.<sup>395</sup> In case of an accident, the energy providers have to contribute their share to compensation if the damage exceeds the mandatory insurance.<sup>396</sup> Although there is no premium payable and payment obligations are only triggered in case of an accident,<sup>397</sup> the availability of the money is secured through an annual certification, which secures the availability of the required sum.<sup>398</sup> The establishment of this financial cover tool makes it possible to reach amounts for liability far beyond the capacity of the insurance sector, but it seems to be difficult to translate it into other regional or international pooling systems, as it requires a lot of cooperation between the parties and similar safety standards.<sup>399</sup>

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<sup>390</sup> section 17(4) *Atomgesetz*; Raetzke op cit (n5) 26

<sup>391</sup> section 14(1) *Atomgesetz*; Keich op cit (n310) 483-484

<sup>392</sup> Keich op cit (n310) 484; Raetzke op cit (n5) 26

<sup>393</sup> *Solidarvereinbarung zwischen Energie Baden-Württemberg AG, E.On Energie AG, Hamburgische Elektrizitäts-Werke AG und RWE AG* 11 July / 27 July / 21 August / 28 August 2001, no official publication available, but reproduced in H Posser et al. *Atomgesetz, Kommentar zur Novelle 2002* (2003) 342

<sup>394</sup> Raetzke op cit (n5) 26; Keich op cit (n310) 484

<sup>395</sup> Raetzke op cit (n5) 26-27; Keich op cit (n310) 484

<sup>396</sup> Raetzke op cit (n5) 27

<sup>397</sup> *Ibid* 28

<sup>398</sup> Keich op cit (n310) 484

<sup>399</sup> Raetzke op cit (n5) 27-28

A further financial cover instrument is laid down in section 34 *Atomgesetz*. The provision regulates the providing of a supplementary state fund in form of a *Freistellungsverpflichtung* (state indemnification).<sup>400</sup> It releases an operator of its liability obligations upon an amount of EUR 2.5 billion if the compensation payable exceeds the financial cover or if the claim could not be answered by the financial cover.<sup>401</sup> In other words, it fills the gap between the compensation available and the damage upon the amount of EUR 2.5 billion.<sup>402</sup> In this context it is important that only the operator has a claim against the German state, while the victim does not.<sup>403</sup> Scenarios in which the *Freistellungsverpflichtung* comes into effect are for example cases in which exclusion clauses in the insurance contracts are in place or cases of non-compliance of an operator.<sup>404</sup> However, since the *Solidarvereinbarung* is in place, which does not provide any exclusion clauses and where the liquidity is checked annually, the importance of the *Freistellungsverpflichtung* has diminished, especially because it provides the same amount of EUR 2.5 billion as the *Solidarvereinbarung*.<sup>405</sup> However, the *Freistellungsverpflichtung* falls under the requirement of a public fund of the second tier of the Brussels Convention, but is far beyond the stated amount.<sup>406</sup>

Furthermore, compensation could also be requested from the Brussels Convention. The problem hereby is that the German liability amounts exceed the thresholds of the tiers in the Brussels Convention. Due to this fact, the third tier of the Brussels Convention is only triggered for Germany, if the compensation payable exceeds the amount of EUR 2.5 billion.<sup>407</sup> For the revised Brussels Convention, this concept was abandoned. Article 9(c) revised Brussels Convention now stipulates that the third-tier funds shall be available, as soon as its threshold is triggered, irrespective if other

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<sup>400</sup> section 34(1) *Atomgesetz*; Raetzke op cit (n5) 28

<sup>401</sup> section 34(1) *Atomgesetz*, Keich op cit (n310) 485

<sup>402</sup> Raetzke op cit (n5) 28

<sup>403</sup> Ibid

<sup>404</sup> Ibid

<sup>405</sup> Keich op cit (n310) 485-486; Raetzke op cit (n5) 28-29

<sup>406</sup> Raetzke op cit (n5) 29

<sup>407</sup> Ibid 30

compensation is still available. This should prevent the punishment of states, which implement high liability amounts.<sup>408</sup>

The last piece in terms of financial security is section 38 *Atomgesetz*. It provides additional compensation for victims in Germany, who suffered damage from an accident, which occurred outside of Germany in a contracting state of the Paris Convention or the Vienna Convention in conjunction with the Joint Protocol, in case he or she does not obtain the same amount of compensation, as they would under German law.<sup>409</sup> The provision is described as a *gesetzliche Ausfallbürgschaft* (statutory deficit guarantee)<sup>410</sup> and aims to provide equal compensation for victims in Germany regardless of which law is applicable.<sup>411</sup> As the compensation is provided by the German state, it is limited to the amount of EUR 2.5 billion, according to the state indemnification of section 34 *Atomgesetz*.<sup>412</sup> In the cases of section 38 *Atomgesetz*, the victims have a direct claim against the German state.<sup>413</sup>

In conclusion, the German system is an unlimited liability system with limited financial cover.<sup>414</sup>

#### 4.3.7 Limited liability in time

The limitation periods of article 8(a) Paris Convention (prescription or extinction after ten years) and the 2004 PC Protocol (extension to 30 years for claims regarding loss of life or personal injury)<sup>415</sup> are surpassed by German law, which sets out a 30-year period for all kinds of damage in section 32(1) *Atomgesetz*.<sup>416</sup> Although such an extension is particularly permitted by article 8(a) Paris Convention, the German government secured its course of action through a reservation to the Paris Convention.<sup>417</sup>

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<sup>408</sup> Raetzke op cit (n5) 30

<sup>409</sup> section 38(1) *Atomgesetz*; Kühne op cit (n318) 2143; Raetzke op cit (n5) 30; OECD & NEA op cit (n309) 21

<sup>410</sup> Fischerhofer et al. op cit (n325) 716; Kühne op cit (n318) 2143; Raetzke op cit (n5) 30

<sup>411</sup> Kühne op cit (n318) 2143

<sup>412</sup> section 38(2) *Atomgesetz*; Kühne op cit (n318) 2143; Raetzke op cit (n5) 30

<sup>413</sup> Raetzke op cit (n5) 31

<sup>414</sup> Pelzer op cit (n359) 46

<sup>415</sup> section 8(a)(i) revised Paris Convention

<sup>416</sup> Raetzke op cit (n5) 20

<sup>417</sup> reservation no. 3 Annex I Paris Convention; Keich op cit (n310) 482; Raetzke op cit (n5) 20

A ‘discovery-rule’, as mentioned above, is also contained in German law and expressed by section 32 *Atomgesetz*.<sup>418</sup> It states the limitation of liability claims to the period of three years after acquiring knowledge of the damage by the victim.<sup>419</sup>

#### 4.3.8 Jurisdiction

The current German law does not include any special provision for the jurisdiction of a special court, which means that several courts would be competent according to the general provisions on jurisdiction.<sup>420</sup> However, in line with the revised Paris Convention and the single court principle,<sup>421</sup> the revised *Atomgesetz* will include a new section 40(a), which assigns exclusive jurisdiction for nuclear damage to the *Landgericht* (regional court) in whose district the accident occurred.<sup>422</sup>

#### 4.4 Assessment and Conclusion

The German nuclear liability regime is embedded in the framework of the Paris Convention system, but modifies and refines it at the given options and margins in favour of the compensation of victims. The result of this attempt is a comprehensive and highly standardised nuclear liability regime, which tries to converge to the ordinary law of delict regime as closely as possible.<sup>423</sup> Germany is also a pioneer in the matter of nuclear liability and several amendments of the 2004 PC Protocol can be traced back to the German nuclear legislation.<sup>424</sup> Despite this exceptional character, several deficits remain. One has to go a little bit more into detail to find them. One disadvantage could be located in relation to the Fukushima accident. The actual Paris Convention still includes the exoneration of ‘a grave natural disaster of an exceptional character.’<sup>425</sup> Therefore, the liability remains limited to EUR 2.5 billion in the

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<sup>418</sup> Keich op cit (n310) 482

<sup>419</sup> section 32 *Atomgesetz*

<sup>420</sup> Raetzke op cit (n5) 31

<sup>421</sup> article 13(h) revised Paris Convention

<sup>422</sup> Raetzke op cit (n5) 31

<sup>423</sup> Raetzke op cit (n5) Ibid 33

<sup>424</sup> Ibid

<sup>425</sup> article 9 Paris Convention

German framework<sup>426</sup> and if the damage is suffered outside of Germany, only is applicable if the other country provides an equal provision.<sup>427</sup>

Furthermore, the *Solidarvereinbarung* is indeed theoretically applicable, but it will not be sufficient in practice, as nuclear damages can entail compensation claims of EUR 100 billion and more. For the case of a nuclear disaster, the capacity of the nuclear operators would not be adequate to cover further compensation claims beyond the *Solidarvereinbarung*. As these claims could not remain unpaid, the claims would fall back to the German state and the tax payers.<sup>428</sup>

A German study<sup>429</sup>, which determined the premium for a nuclear insurance, even came to the result for the expectable average amount for a nuclear accident in the amount of EUR 6.009 billion.<sup>430</sup> They went beyond that and measured the premium of the insurance for different periods of the lifetime of the insurance, between ten and 100 years. Based on the payable premiums, they had a look at the electricity prices as they wanted to find out if these costs could be spread on the electricity prices from nuclear energy. The result was that the prices would have to be increased between EUR 0.139 per kWh (for a lifetime of 100 years) and EUR 67.3 per kWh (for a lifetime of ten years).<sup>431</sup> While even the first amount would mean a significant increase of the electricity prices and would make nuclear energy unprofitable, the second figure would not be payable at all. Thus they came to the result that the German energy providers are insufficiently insured, but also that nuclear accidents in fact are not insurable at all.<sup>432</sup>

A further deficit could be found in section 13(a) Paris Convention, which states that the courts of the country in whose territory the nuclear accident occurred are competent. This is fully applicable in Germany and is also reflected generally by the Ger-

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<sup>426</sup> section 31(1) in conjunction with section 34(1) *Atomgesetz*; Keich op cit (n310) 487

<sup>427</sup> section 31(2) *Atomgesetz*

<sup>428</sup> Keich op cit (n310) 487

<sup>429</sup> Versicherungsforen Leipzig *Berechnung einer risikoadäquaten Versicherungsprämie zur Deckung der Haftpflichtrisiken, die aus dem Betrieb von Kernkraftwerken resultieren* (2011)

<sup>430</sup> Versicherungsforen Leipzig op cit (n429) 101

<sup>431</sup> Versicherungsforen Leipzig op cit (n429) 102-103

<sup>432</sup> Ibid 103

man legislation of liability for environmental damages.<sup>433</sup> This regulation is a disadvantage for foreign victims, as they are not able to bring claims to court in their own language. A solution, which allows claims also at the places, where the damage was suffered, would be preferable.<sup>434</sup>

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<sup>433</sup> H Gaßner & G Buchholz *Atomhaftung in Europa und Deutschland – Defizite und Empfehlungen zur Fortentwicklung* (2013) available at [https://www.gruene-bundestag.de/fileadmin/media/gruenebundestag\\_de/themen\\_az/atomausstieg/Gutachten\\_Atomhaftung\\_B90\\_Gruene\\_Maerz\\_2013\\_.pdf](https://www.gruene-bundestag.de/fileadmin/media/gruenebundestag_de/themen_az/atomausstieg/Gutachten_Atomhaftung_B90_Gruene_Maerz_2013_.pdf) accessed on 17 December 2017 21-22

<sup>434</sup> *Ibid* 47-48

## Chapter 5 – South African nuclear liability regime

### 5.1 Introduction

Nuclear energy is not only used in developed countries, it is also popular in more developing countries, such as South Africa. The country has already two operational reactors, both located in Koeberg in the Western Cape.<sup>435</sup> Furthermore, the government is busy with expanding its nuclear energy programme. It recently signed a contract with the Russian enterprise Rosatom about the building of a range of reactors with a total capacity of 9.6 GW.<sup>436</sup> Although this agreement was suspended by the Western Cape High Court due to administrative law reasons,<sup>437</sup> the further development of nuclear energy in South Africa will not be stopped. Recently, the Department of Environmental Affairs granted the environmental authorisation for a nuclear power plant at Duynefontein in the Western Cape.<sup>438</sup> Due to this new development it is worth having a look on the nuclear liability regulation of South Africa and their performance in comparison with the international regime and the high standard regime in Germany.

Nuclear energy is regulated by three different acts in South Africa: the Nuclear Energy Act<sup>439</sup> (NEA) and the National Nuclear Regulator Act<sup>440</sup> (NNRA), which together replaced the old Nuclear Energy Act<sup>441</sup> (NEA 1993), and the National Radioactive Waste Disposal Institute Act<sup>442</sup> (NRWDIA). While the NEA is more concerned about general topics of nuclear energy, such as the establishment of a Nuclear Energy Corporation Limited, the dealing with the Treaty on the Non-Proliferation of Nu-

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<sup>435</sup> WNA op cit (n10)

<sup>436</sup> see footnote 8

<sup>437</sup> *Earthlife Africa Johannesburg v Minister of Energy* 2017 (5) SA 227 (WCC)

<sup>438</sup> Unknown 'South Africa: Department of Environmental Affairs grants Environmental Authorisation for the proposed construction and operation of the Eskom Nuclear Power station at Duynefontein in Western Cape' *Mena Report Academic OneFile*, October 2017, available at <http://link.galegroup.com/apps/doc/A510737697/AONE?u=unict&sid=AONE&xid=51e568a4> accessed on 17 December 2017

<sup>439</sup> Act 46 of 1999

<sup>440</sup> Act 47 of 1999

<sup>441</sup> Act 131 of 1993

<sup>442</sup> Act 53 of 2008; M Kidd *Environmental Law* 2ed (2011) 194; the Nuclear Energy Policy 2008 is silent about the topic of nuclear liability, see Department of Minerals and Energy *Nuclear Energy Policy for the Republic of South Africa* (2008) available at [http://www.energy.gov.za/files/policies/policy\\_nuclear\\_energy\\_2008.pdf](http://www.energy.gov.za/files/policies/policy_nuclear_energy_2008.pdf) accessed on 19 December 2017

clear Weapons<sup>443</sup> and the possession and export / import of nuclear fuel, the NNRA mainly deals with the regulation of nuclear activities and safety standards.<sup>444</sup> The NRWDIA lastly deals with the bigger topic of nuclear waste management.<sup>445</sup>

## 5.2 History of South African nuclear liability

The history of the use of nuclear energy in South Africa can be traced back to the 1960s, when South Africa started the research for a commercial nuclear power plant.<sup>446</sup> South Africa was a producer of uranium, mainly as a by-product of the rich gold mines in the Witwatersrand<sup>447</sup> and exported it to Britain and the USA from the 1950s on for the construction of their nuclear weapons.<sup>448</sup> As the export to Britain and the USA got stuck in 1964, the mining industry and the nuclear researchers called for an own nuclear energy programme and the building of a nuclear power plant.<sup>449</sup> As a country with massive coal resources, the development of a nuclear power plant could be only envisaged in a place far away from the coal fields. Thus the decision fell on the Western Cape. Due to this consideration and with the oil crisis of 1973 / 1974, which made it possible to justify the costs for the development of a nuclear power plant, the first, and until today the only South African nuclear power plant was built in Koeberg in the Western Cape.<sup>450</sup> The first reactor unit finally got on the grid in September 1984, followed by the second unit a year later.<sup>451</sup>

With the operation of two nuclear reactors, there was the need to establish related legislation. Hence the first Nuclear Energy Act<sup>452</sup> (NEA 1982) was adopted in 1982, which stipulated the establishment of a Council for Nuclear Safety (CNS) as a regulatory agency,<sup>453</sup> which was finally founded in 1988.<sup>454</sup> The CNS was also integrated

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<sup>443</sup> Treaty on the Non-Proliferation of Nuclear Weapons, 01 July 1968, 729 *UNTS* 161

<sup>444</sup> J Glazewski *Environmental Law in South Africa* 4ed (2016) 18-40 – 18-42; Kidd op cit (n442) 194-195

<sup>445</sup> Kidd op cit (n442) 196

<sup>446</sup> Fig op cit (n19) 54

<sup>447</sup> Fig op cit (n4) 2; WNA op cit (n8)

<sup>448</sup> Fig op cit (n4) 3

<sup>449</sup> Fig op cit (n19) 54

<sup>450</sup> Ibid 55

<sup>451</sup> Fig op cit (n19) 57; J-A van Wyk 'South Africa's Nuclear Future' (2013) 150 *Occasional Paper SAIIA* 7

<sup>452</sup> Act 92 of 1982

<sup>453</sup> section 24 NEA 1982

<sup>454</sup> Fig op cit (n19) 59

in the NEA 1993<sup>455</sup> by awarding it with several functions, such as the granting of nuclear licences,<sup>456</sup> and thereby it asserted more regulatory authority and independence.<sup>457</sup> With the rewriting of South Africa's nuclear legislation, the regulatory regulations were set out in the NNRA and the CNS was replaced by the National Nuclear Regulator (NNR), which inherited most of its functions.<sup>458</sup> The NNR is governed by a Board of Directors,<sup>459</sup> which is also concerned with nuclear liability matters.<sup>460</sup> Provisions regarding nuclear liability were already established in the NEA 1993. However, this took place in a rudimentary and partial way.<sup>461</sup> With the establishment of the NNRA, which was adopted as a separate act apart from the NEA due to the reason that the sectors of nuclear safety and the sector of development of nuclear technologies should be separated,<sup>462</sup> the provisions for nuclear liability were enhanced and bundled. They are now laid down in chapter 4 of the NNRA, more precisely in sections 29-35 NNRA.

### 5.3 Elements of South African nuclear liability

The nuclear liability regime in the sections 29-35 NNRA is orientated to the nuclear liability principles worked out in chapter 3.3.1, even though South Africa is not a contracting state to any of the outlined international conventions.<sup>463</sup> The features of South Africa's nuclear liability legislation are outlined in the following, before they are assessed against the international and the German nuclear liability framework. The special provisions concerning the liability for nuclear vessels in section 31 NNRA, similar to section 25a *Atomgesetz* in Germany, and the provisions for the compensation of the Regulator's employees in section 35 NNRA are not dealt with in further detail, as they are not part of the general international nuclear liability regime and their assessment would go beyond the scope of this study.

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<sup>455</sup> section 33 NEA 1993

<sup>456</sup> section 35 NEA 1993

<sup>457</sup> section Fig op cit (n19) 59

<sup>458</sup> section 7 NNRA; Fig op cit (n19) 60

<sup>459</sup> section 8(1) NNRA

<sup>460</sup> section 29 NNRA

<sup>461</sup> section 59, 61 & 64 NEA 1993

<sup>462</sup> Glazewski op cit (n444) 18-42

<sup>463</sup> KA Qasaymeh *South Africa's peaceful use of nuclear energy under the Nuclear Non-Proliferation treaty and related treaties* (2014) 192; WNA op cit (n10)

### 5.3.1 Strict liability

The most significant principle of nuclear liability, strict liability, is reflected in the South African legislation.<sup>464</sup> Section 30(1) NNRA stipulates that the holder of a nuclear installation licence is liable for nuclear damage, irrespective of intent or negligence.<sup>465</sup> In accordance with the international provisions, the strict liability refers to both incidents on a nuclear installation site<sup>466</sup> and incidents during a transport under the responsibility of the licence holder.<sup>467</sup> The NNRA further provides a specific provision for persons, who conduct actions without a nuclear installation licence, which normally would require one. These persons are strictly liable in the same way as a holder of a licence.<sup>468</sup> Such a provision is neither contained in the international nor in the German legislation.

### 5.3.2 Exclusive liability

Section 30(1) NNRA also includes the principle of channelling liability to the holder of a nuclear installation licence,<sup>469</sup> which can be read from the expression that ‘only’ the holder is liable for ‘all’ nuclear damage.<sup>470</sup> Consequently it is striking that the South African legislation does not include the word ‘operator’ in contrast to the international conventions and the German legislation, although the German and the South African legislation hold the same entity liable, the licence holder.<sup>471</sup> The reason why could be the fact that the German legislation had to bring its legislation in line with the international regulations, while the South African legislation is not required to clarify this due to the lack of any international convention membership.

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<sup>464</sup> Kidd op cit (n442) 196

<sup>465</sup> The term ‘nuclear installation’ is defined by section 1(xviii)(a) NNRA and includes facilities processing with radioactive substances, such as uranium and thorium, and nuclear fuel. The Minister of Energy has further the possibility to determine a installation as ‘nuclear installation’ according to section 1(xviii)(b) & 2(3) NNRA. Categorized as nuclear installation are mainly the Koeberg Nuclear Power Station, the Safari-1 Research Reactor and the Vaalputs National Radioactive Waste Disposal Facility. Regulations about the application for a nuclear installation licence could be found in section 21 NNRA.

<sup>466</sup> section 30(1)(a) NNRA

<sup>467</sup> section 30(2)(b) NNRA

<sup>468</sup> section 30(8) NNRA

<sup>469</sup> D Kgomo ‘South Africa’s Legal Framework of Third Party Liability for Nuclear damage’, March 2014, available at <http://www.nuclearafrica.co.za/pdf/conference2014/Ditebogo%20Kgomo%20-%20Nuclear%20Liability%20Legal%20Framework.pdf> accessed on 17 December 2017 6

<sup>470</sup> section 30(1) NNRA

<sup>471</sup> as seen above, the German legislation defines the licence holder as the operator of the nuclear installation in section 17(6) *Atomgesetz*

### 5.3.3 Exoneration of liability

Besides the general scope of the nuclear liability provisions, which exonerates nuclear damage occurring on the nuclear installation site<sup>472</sup> and which is also laid down in the international and German legislation, and the regulations for contributory negligence,<sup>473</sup> the South African nuclear liability regime does not provide any exoneration provisions.<sup>474</sup>

### 5.3.4 Damage to be compensated

The licence holder is liable for nuclear damage according to section 30(1) NNRA. The term is further defined in the definition section as

- ‘(a) any injury to or the death or any sickness or disease of a person; or
- (b) other damage, including any damage to or any loss of use of property or damage to the environment.’<sup>475</sup>

Therefore, the South African legislation includes the general damage categories concerning personal property damages, such as the recent international conventions.<sup>476</sup> It even provides for compensation of damage to the environment, even though the term is not further defined. A definition for ‘environment’, like in the Mineral and Petroleum Resources Development Act<sup>477</sup> (MPRDA) with references to the definition of National Environmental Management Act<sup>478</sup> (NEMA) is missing,<sup>479</sup> as well as a further classification of which kind of environmental damages are compensable, as in the international conventions.<sup>480</sup>

### 5.3.5 Nature and amount of liability

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<sup>472</sup> section 30(6)(a) NNRA

<sup>473</sup> section 30(6)(b) NNRA; in Germany section 27 *Atomgesetz*

<sup>474</sup> Kgomo op cit (n469) 7

<sup>475</sup> section 1(xv) NNRA

<sup>476</sup> see article 1(1)(k) revised Vienna Convention & article 1(a)(vii) revised Paris Convention

<sup>477</sup> Act 28 of 2002

<sup>478</sup> Act 107 of 1998

<sup>479</sup> section 1 ‘environment’ MPRDA

<sup>480</sup> see article 1(1)(k)(iv) & (vii) revised Vienna Convention & article 1(a)(vii)(4) & (5) revised Paris Convention

Section 30(2) NNRA stipulates the nature of liability. It states that liability of the holder of a nuclear installation licence is limited<sup>481</sup> and, thus, reflects the general nuclear liability principle of limited liability. The amount of liability is congruent with the financial security, which must be provided by the licence holder according to section 29(2) NNRA.<sup>482</sup> Thus, it reflects the principle of congruent financial security. Another section concerned with the amount of liability is section 32(1) NNRA, which stipulates that the liability of a holder of a certificate of registration must be determined in line with the common law and the Compensation for Occupational Injuries and Diseases Act.<sup>483</sup> This section explicitly refers to the holder of a certificate of registration, which is referred to in section 22 NNRA. Such a certificate is needed for actions, which can cause nuclear damage other than for actions on nuclear installation sites.<sup>484</sup> Insofar the provision does not refer to holders of nuclear installation licences and therefore is not applicable.<sup>485</sup> This argumentation is supported by the NNRA, which distinguishes between application for a nuclear installation licence (section 21 NNRA) and the application for a certificate of registration (section 22 NNRA). Furthermore, the distinction also makes sense, as it is important to provide clear determined statutory provisions for major risks of large nuclear damages from nuclear installations, while the common law could provide more flexible and better fitting solutions for a lot more and different actions with a lower risk profile.

### 5.3.6 Financially secured liability

The South African legislation also stipulates the obligation of a mandatory financial security for the liability obligations of a nuclear installation in section 29(1) & (2) NNRA, in accordance with the amount of limited liability.<sup>486</sup> The Minister of Energy is assigned to determine the amount of financial security in accordance with the Board of Directors.<sup>487</sup> Therefore, the Minister has to determine categories of nuclear

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<sup>481</sup> Kgomo op cit (n469) 6

<sup>482</sup> section 30(2) NNRA

<sup>483</sup> Act 130 of 1993; section 31(1) NNRA

<sup>484</sup> <http://www.nnr.co.za/acts-regulations/overview-of-regulatory-framework/> accessed on 17 December 2017

<sup>485</sup> agreeing Qasaymeh op cit (n463); in contrast to the opinion of Glazewski op cit (n444) 18-43, who determines the liability of the holder of a nuclear installation licence according to section 32 NNRA

<sup>486</sup> section 30(2) NNRA in conjunction with section 29(2) NNRA; Kgomo op cit (n469) 6

<sup>487</sup> section 29(1) & (2) NNRA

installations and amounts of financial security for the individual categories.<sup>488</sup> The various nuclear installations in South Africa have to then be classified in one of the categories.<sup>489</sup>

### 5.3.6.1 NNRA Regulations concerning financial security

These stipulations were implemented with the enactment of regulations in 2004<sup>490</sup> (NNRA-REG). The sole nuclear power plant in Koeberg is classified as a category 1 installation,<sup>491</sup> for which a financial security of R 2.4 billion must be provided.<sup>492</sup> While the Safari-1 Research Reactor is a category 2 installation<sup>493</sup> with a financial security level of R 120 million,<sup>494</sup> the Vaalputs National Radioactive Waste Disposal Facility is classified in category 3<sup>495</sup> with a financial security level of R 1 million.<sup>496</sup> The financial security could be provided either through insurance or monetary guarantee.<sup>497</sup>

Although the general principles of international nuclear liability are reflected in this context by the South African legislation, the amount of liability and financial security is far beyond the current international standards.<sup>498</sup> This lack was also recognized by the NNR, which reviewed the levels of financial security and recommended the increase of the amounts to the Minister of Energy.<sup>499</sup> In this context, a government notice was recently published for public comments on the amendment of the mentioned regulations concerning the liability amount and financial security.<sup>500</sup> This new proposed NNRA-REG would upgrade the nuclear liability framework in several points.

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<sup>488</sup> section 29(2) NNRA

<sup>489</sup> section 29(1) NNRA

<sup>490</sup> GN 581 in GG 26327 07 May 2004

<sup>491</sup> section 2(a) NNRA-REG

<sup>492</sup> section 3(a) NNRA-REG, approximately EUR 160 million

<sup>493</sup> section 2(b) NNRA-REG

<sup>494</sup> section 3(b) NNRA-REG, approximately EUR 8 million

<sup>495</sup> section 2(c) NNRA-REG

<sup>496</sup> section 3(c) NNRA-REG, approximately EUR 67.000

<sup>497</sup> section 4 NNRA-REG

<sup>498</sup> Kgomo op cit (n469) 7; the revised Paris Convention stipulates EUR 700 million and the revised Vienna Convention stipulates SDR 300 million

<sup>499</sup> NNR 7<sup>th</sup> *National Report by South Africa on the Convention on Nuclear Safety* (2016) available at <http://www.nnr.co.za/wp-content/uploads/2015/02/7th-CNS-Report-RSA.pdf> accessed on 17 December 2017 20, 54

<sup>500</sup> GN 773 in GG 41023 04 August 2017 (proposed NNRA-REG)

Firstly, the proposed NNRA-REG do not only categorize the several nuclear installations in South Africa, but they also provide for requirements and criteria for the different categories;<sup>501</sup> for example a reactor with a thermal power level of more than 100 MW is classified as a category 1 installation.<sup>502</sup> This provision would be a great advantage in terms of transparency and legal certainty, as it sets out a general set of rules for the classification of nuclear installation. The provisions would concretise the indefinite section 29(1) NNRA, which is so far the basis for the classification and which only states that it is up to the Minister of Energy to categorise the nuclear installations.

Secondly, the most important amendment is the increase of the financial security levels and at the same time the amount of liability. The amounts are raised for category 1 installations to SDR 367 million,<sup>503</sup> for category 2 installations to SDR 44 million<sup>504</sup> and for category 3 installations to SDR 3 million.<sup>505</sup> Besides the fact that this amendment would constitute a huge increase of liability and financial cover,<sup>506</sup> the conversion from Rand to SDR, in accordance with the international conventions, entails more continuity and security of financial liquidity, irrespective the potential uncertainty of the currency. Furthermore, the proposed NNRA-REG stipulate the annually review of the financial security.<sup>507</sup> This is important, as it clarifies the vague and confusing section 29(5) NNRA and further stipulates the alignment of the provided financial security with the financial requirements of section 4(1) proposed NNRA-REG if the exchange rate fluctuates.<sup>508</sup> The idea of independence from the exchange rate and, thus, a higher level of liability and financial security is clearly expressed in this section.

### 5.3.6.2 State indemnification

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<sup>501</sup> section 3 proposed NNRA-REG

<sup>502</sup> section 3(1)(a)(i) proposed NNRA-REG

<sup>503</sup> section 4(1)(b) proposed NNRA-REG, approximately EUR 440 million

<sup>504</sup> section 4(1)(b) proposed NNRA-REG, approximately EUR 53 million

<sup>505</sup> section 4(1)(c) proposed NNRA-REG, approximately EUR 3.6 million

<sup>506</sup> The amount for category 1 installations would be nearly tripled and the amount for category 3 installations would be more than a hundred times the former amount.

<sup>507</sup> section 5(2) proposed NNRA-REG

<sup>508</sup> section 5(3) proposed NNRA-REG

In accordance to the German nuclear liability regime, the South African legislation also provides for some kind of state indemnification. While the regulations in Germany are very clear and linked to special amounts of compensation,<sup>509</sup> the stipulations in section 33 NNRA are very vague. The section stipulates that the holder of a nuclear installation licence has to inform the Minister of Energy, when claims for nuclear damage against him or her exceed the amount of his or her financial security.<sup>510</sup> In such a case, the parliament must be informed and must decide whether the state covers the claims for compensation exceeding the liability of the licence holder.<sup>511</sup> In general such a provision is useful for the benefit of victims, however in the South African legislation it is not explicit enough. The provision should stipulate that the state is obligated to provide for additional financial compensation. It should be further stated upon which amount the state is obligated, as otherwise the provision does not have a real value for victims.

### 5.3.7 Limited liability in time

The liability of the holder of a nuclear installation licence is not only limited in amount, but also in time stated in section 34 NNRA.<sup>512</sup> This provision could be regarded as very progressive, as it stipulates a prescription period of 30 years for all kinds of nuclear damage, irrespective the kind of damage.<sup>513</sup> Furthermore, the legislation also provides for a ‘discovery rule’ of two years in section 34(2) NNRA.

### 5.3.8 Jurisdiction

As South Africa is not a contracting state to any of the international conventions on nuclear liability, the question of the competent jurisdiction does not arise. Although there is no special regulation, the exclusive jurisdiction of the South African courts is implied.<sup>514</sup>

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<sup>509</sup> see chapter 4.3.6

<sup>510</sup> section 33(1) NNRA

<sup>511</sup> section 33(3) NNRA

<sup>512</sup> Kgomo op cit (n469) 6

<sup>513</sup> section 34(1) NNRA; Kgomo op cit (n469) 7

<sup>514</sup> Kgomo op cit (n469) 6; Qasaymeh op cit (n463) 195

## 5.4 Comparative assessment

The discussion of the several nuclear liability elements in the South African legislation shows that in general the international principles worked out in chapter 3.3.1 are reflected and implemented in the legislation.<sup>515</sup> Particularly it stipulates a strict and exclusive liability regime, which limits the liability to a certain amount and in time. In addition, the principle of congruent financial security is also laid down in the South African legislation.

### 5.4.1 Progressive provisions

In comparison with the international framework, the regulation of exonerations is outstanding. While all international conventions include exonerations,<sup>516</sup> especially for *force majeure* events, the South African legislation is silent on them. With regards to the Fukushima accident, the Paris Convention system would not have been applicable, as it still includes the exoneration of a grave natural disaster until the 2004 PC Protocol enters into force.<sup>517</sup> Even the German legislation, which is regarded as very progressive and comprehensive, abrogated all exonerations, but provides only limited liability in *force majeure* events.<sup>518</sup> This is especially unfortunate, as the extent of nuclear damage caused by a *force majeure* event is potentially very extensive. Compared to these two legal systems, the South African approach is the most progressive one,<sup>519</sup> as it includes no exonerations and thus it does not stipulate any exception rules in case of a *force majeure* event.

A further provision, which can be highlighted is section 34(1) NNRA, which codifies a prescription period of 30 years, irrespective of the nature of damage. It includes personal damages, as well as property and environmental damage. Bearing in mind that the international framework, which extended the time limit for personal injury and loss of life to 30 years only in the VC Protocol<sup>520</sup> and the PC Protocol,<sup>521</sup> this is

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<sup>515</sup> Kgomo op cit (n469) 7

<sup>516</sup> see chapter 3.3.2

<sup>517</sup> article 9 Paris Convention in comparison with article 9 revised Paris Convention

<sup>518</sup> section 31(1) *Atomgesetz* in conjunction with section 34(1) *Atomgesetz*

<sup>519</sup> Kgomo op cit (n469) 7

<sup>520</sup> article (VI)(1)(a)(i) revised Vienna Convention

<sup>521</sup> article 8(a)(i) revised Paris Convention

quite outstanding.<sup>522</sup> Therefore, the South African nuclear liability regime is on the same level as the German nuclear liability regime, which also stipulates a prescription period of 30 years for all kind of damages.<sup>523</sup> The recommendation to reduce the time limit for damages other than personal injury and loss of life,<sup>524</sup> should not be followed, the high standard should rather be maintained for the benefit of the victims and the environment.

Another progressive provision with further potential is found at the beginning of the NNRA. Besides the standard damage categories the definition of nuclear damage, section 1(xv) NNRA, also includes the category of damage to the environment. While the international framework has recently expanded its damage categories, including damage related to environment,<sup>525</sup> the German nuclear legislation does not include any such provision and only refers to the international provisions.<sup>526</sup> None of them include such a clear statement to environmental damage in general. However, it would be important to further define the term environment to attribute more value to this damage category, such as in the MPRDA with reference to the definition of environment in NEMA.<sup>527</sup> It would be desirable to include preventive measures<sup>528</sup> and in general a more detailed and structured categorization of damage categories in accordance with the international framework is desirable.<sup>529</sup> Presuming that the term 'environmental damage' in the NNRA is in line with the definition of NEMA, a significant difference emerges. As examined in chapter 4.3.4 the German legislation does only provide for compensation of environmental damage, if the environment is attributed to a person,<sup>530</sup> the definition of NEMA includes a more holistic approach of definition of environment. This is further supported by the environmental right of the South African Constitution.<sup>531</sup>

#### 5.4.2 Deficits

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<sup>522</sup> Kgomo op cit (n469) 7

<sup>523</sup> section 32(1) *Atomgesetz*

<sup>524</sup> Kgomo op cit (n469) 9

<sup>525</sup> article 1(a)(vii) revised Paris Convention; article I(1)(k) Vienna Convention

<sup>526</sup> see chapter 4.3.4

<sup>527</sup> section 1 'environment' MPRDA; section 1 'environment' NEMA

<sup>528</sup> Kgomo op cit (n469) 7

<sup>529</sup> article 1(a)(vii) revised Paris Convention; article I(1)(k) Vienna Convention

<sup>530</sup> Raetzke op cit (n5) 19

<sup>531</sup> section 24 Constitution of the Republic of South Africa 1996

Despite these positive and progressive provisions in the South African nuclear legislation, it also shows several deficits, which will be outlined.

#### 5.4.2.1 No party to any international nuclear liability convention

South Africa is currently not a state party to any international nuclear liability convention,<sup>532</sup> nevertheless it is an IAEA member since the early beginning in 1957<sup>533</sup> and has signed several conventions regarding nuclear energy, such as the Convention on Nuclear Safety.<sup>534</sup> Besides the fact that South Africa should join the international nuclear liability convention system due to its general international responsibility as a nuclear country,<sup>535</sup> a membership would bring a lot of advantages.<sup>536</sup> Therefore, the accession to one of the conventions is highly recommended.<sup>537</sup> As a non-European country and non-OECD member, the accession to the Vienna Convention, the Convention on Supplementary Compensation or both would be the best choice.<sup>538</sup> In the opinion of the author of this study, signing the Convention on Supplementary Compensation would be the first and easiest step to join the international convention system, as this Convention allows for the greatest freedom. This is because the Convention on Supplementary Compensation, which has the potential of a global nuclear liability regime,<sup>539</sup> only requires to be in line with the principles set out in the annex of the convention from contracting states.<sup>540</sup> Right now South Africa's legislation generally is in line with these stipulations and only minor adjustments would be required in order to be able to join the convention.<sup>541</sup>

The advantages of such a membership include the applicability of the exclusive jurisdiction principle, which assigns the jurisdiction to only one particular court and

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<sup>532</sup> Davies op cit (n6) 30; IAEA *Mission report on the integrated nuclear infrastructure review (INIR) South Africa* (2013) available at [http://www.nnr.co.za/wp-content/uploads/2016/11/Approved\\_INIR\\_Report\\_Republic-of-South-Africa.pdf](http://www.nnr.co.za/wp-content/uploads/2016/11/Approved_INIR_Report_Republic-of-South-Africa.pdf) accessed on 17 December 2017 29

<sup>533</sup> <https://www.iaea.org/about/governance/list-of-member-states> accessed on 17 December 2017

<sup>534</sup> Convention on Nuclear Safety, 17 June 1994, 1963 *UNTS* 293; Davies op cit (n6) 30

<sup>535</sup> Davies op cit (n6) 38

<sup>536</sup> *Ibid* 37

<sup>537</sup> IAEA op cit (n532) 29; Kgomo op cit (n469) 8

<sup>538</sup> Davies op cit (n6) 42; IAEA op cit (n532) 29

<sup>539</sup> Davies op cit (n6) 30

<sup>540</sup> McRae op cit (n234) 77; Davies op cit (n6) 30

<sup>541</sup> Davies op cit (n6) 35

prevents ‘forum shopping’.<sup>542</sup> In addition it would be easier to recognise and enforce judgments of other member countries.<sup>543</sup> Moreover, the implementation of the required principles would establish a liability and compensation regime with a high level of certainty and predictability.<sup>544</sup> Finally, South Africa would benefit from the additional international fund, which is provided by all contracting states up to an amount of approximately SDR 300 million.<sup>545</sup> However, it could be a burden for South Africa that compensation would have to be paid to a larger circle of people, but this risk is manageable, especially as no other country close to South Africa is a contracting state,<sup>546</sup> and the convention explicitly allows limiting the scope of liability to damages in contracting states.<sup>547</sup>

In the light of these predominant advantages, the questions arises why South Africa has not joined the Convention on Supplementary Compensation. One reason could be the remote geographical location of South Africa,<sup>548</sup> as there is no other nuclear industry state around them.<sup>549</sup> Another reason could be the general requirements of the convention regarding the nuclear liability provisions and the fund requirements especially.<sup>550</sup> However, if looking closer, the requirements are not as tough as they are at first sight. Even though the convention requires the availability of at least SDR 300 million for compensation on the national level,<sup>551</sup> it does not stipulate on what basis the availability of the amount is ensured.<sup>552</sup> It even provides for the possibility to split the amount between the operator and a public fund.<sup>553</sup> Regarding the international fund, it is important to outline that the states do not have to provide any fund in advance, they have to contribute only in case the additional fund is needed, for

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<sup>542</sup> Davies op cit (n6) 37

<sup>543</sup> Ibid

<sup>544</sup> Ibid

<sup>545</sup> Ibid 33

<sup>546</sup> [https://www.iaea.org/Publications/Documents/Conventions/supcomp\\_status.pdf](https://www.iaea.org/Publications/Documents/Conventions/supcomp_status.pdf) accessed on 17 December 2017

<sup>547</sup> Davies op cit (n6) 34

<sup>548</sup> Ibid 40

<sup>549</sup> the only contracting state to the Convention on Supplementary Compensation in Africa is Ghana (Senegal only signed it) and both do not operate a nuclear power plant, [https://www.iaea.org/Publications/Documents/Conventions/supcomp\\_status.pdf](https://www.iaea.org/Publications/Documents/Conventions/supcomp_status.pdf) accessed on 17 December 2017

<sup>550</sup> Davies op cit (n6) 39

<sup>551</sup> article I(a)(i) Convention on Supplementary Compensation

<sup>552</sup> Davies op cit (n6) 32

<sup>553</sup> article 4(2) Convention on Supplementary Compensation

example in the case of nuclear damage exceeds the national compensation amount provided by a contracting state.<sup>554</sup> Furthermore, the contributions are mainly divided on the basis of the contracting states' nuclear capacity.<sup>555</sup> South Africa's share would therefore be rather small,<sup>556</sup> which must be weighed against the potential benefit from the international fund in case of an accident in South Africa.<sup>557</sup>

In the light of this argumentation, it would be more than important for South Africa to join at least the Convention on Supplementary Compensation. As outlined, it would have many advantages and the burden and requirements are not high, especially as South Africa already meets most of them. This should also be considered in terms of the international responsibility as a nuclear industry, especially since the Chernobyl and Fukushima accidents. In this context it is not sufficient to be only an IAEA member and party to several agreements of nuclear energy and safety issues,<sup>558</sup> the responsibility rather entails to also be part of the international nuclear liability regime.

#### 5.4.2.2 Amount of liability and financial security provisions

The requirements of the Convention on Supplementary Compensation lead to another area of deficit. Presently – in December 2017 – the provisions concerning the liability amount for compensation and the system of financial security are quite weak.<sup>559</sup> One reason is the low liability amount and the accompanied requirement for financial security, but the provisions are also too uncertain and unpredictable. The current liability amount for a nuclear power plant is R 2.4 billion,<sup>560</sup> which is much lower than the required SDR 300 million of the Convention on Supplementary Com-

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<sup>554</sup> Davies op cit (n6) 39

<sup>555</sup> Ibid 33

<sup>556</sup> according to the IAEA Calculator for the Convention on Supplementary Compensation, South Africa's share would be at the moment around 1.6 per cent, but would further decline with more contracting states,  
*https://ola.iaea.org/ola/CSCND/Summary.asp?aList=ARG,CAN,GHA,IND,JPN,MNE,MOR,ROM,SAF,UAE,USA,&inst=* accessed on 17 December 2017

<sup>557</sup> Davies op cit (n6) 39

<sup>558</sup> Davies op cit (n6) 38

<sup>559</sup> against the opinion of Davies op cit (n6) 33, who sees the South African legislation largely aligned to the national compensation requirements of the Convention on Supplementary Compensation

<sup>560</sup> section 3(a) NNRA-REG, approximately

compensation.<sup>561</sup> Furthermore, the categorization of the nuclear installation and the determination of a liability amount are mainly left to the discretion of the Minister of Energy. This is further enhanced by the fact that the Minister also appoints the Board of the NNR.<sup>562</sup> In comparison, in Germany all crucial provisions concerning the amount liability and financial security are included in the legislation.<sup>563</sup> The legislation only assigns the right to regulate specific details of the financial security to the government, which it implemented through the Financial Security Ordinance.<sup>564</sup>

The proposed NNRA-REG, which are not yet in force, could provide certain improvements. Raising the liability amount to SDR 367 million for a nuclear power plant<sup>565</sup> is mandatory if South Africa wants to join an international convention. The conversion to SDR is also welcome, as it could provide more predictability irrespective of any exchange fluctuations. Furthermore, the establishment of categories for nuclear installations with certain criteria,<sup>566</sup> instead of just categorising the existing nuclear installations,<sup>567</sup> is a step in the right direction. However, this task is still left to the discretion of the Minister of Energy. It would be preferable if the criteria for the categories would be determined by an act of parliament. Furthermore, the provision of different categories about different kinds of nuclear installations is doubtful in general, as neither the international framework nor the German legislation includes such a distinction of nuclear installations.<sup>568</sup>

Another vague provision is section 33 NNRA, which is concerned with additional funds for claims exceeding the maximum liability. The question if and to what extent additional financial means are provided should be determined by the parliament for every single case.<sup>569</sup> Such a provision includes a high level of uncertainty, regardless of the fact that the parliament is involved in the decision. A state indemnification

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<sup>561</sup> in comparison the German legislation stipulates unlimited liability and requires financial security of EUR 2.5 billion

<sup>562</sup> IAEA op cit (n532) 3

<sup>563</sup> see chapter 4.3.5 & 4.3.6

<sup>564</sup> see chapter 4.3.6

<sup>565</sup> section 4(1)(a) proposed NNRA-REG

<sup>566</sup> section 3(1) proposed NNRA-REG

<sup>567</sup> section 2 NNRA-REG

<sup>568</sup> see the definition of nuclear installation: article 1(a)(ii) Paris Convention, article I(1)(j) Vienna Convention, section 2(3a) *Atomgesetz*

<sup>569</sup> section 33(3) NNRA

regulation as in the German legislation, which includes certain provisions for the trigger of the public fund and a maximum amount,<sup>570</sup> would be preferable and more predictable for all parties involved. It could also be used in terms of international conventions, which require the availability of public funds in a certain amount.

As this argumentation has shown these provisions should be refined. The recent approaches are a good start, but it is also crucial to rework the provision concerning state indemnification.<sup>571</sup> Otherwise a nuclear accident would mainly be at the expense of the victims and the tax payers. In addition, the discretion of the Minister of Energy should be reconsidered. If the competence stays with the Department of Energy, certain safeguards should be incorporated in the legislation, which would allow the parliament to monitor the work of the Minister.

## **Chapter 6 – Conclusion**

Although people might think, nuclear energy is a rather clean and safe way of producing energy,<sup>572</sup> the recent accidents have vividly showed the massive risk of this technology. If an accident at the scale of Chernobyl occurred at the Koeberg site, huge detrimental effects to Cape Town and the Peninsula would ensue. Besides the fact that four million inhabitants would have to be resettled, the whole tourist, manufacture and agricultural sector would be destroyed and the unique Cape floral kingdom would be contaminated.<sup>573</sup> Considering these dimensions, one has to acknowledge that an effective nuclear liability regime is crucial to be prepared for such a worst case scenario. Therefore, it was the scope of the study to examine and compare the South African nuclear liability legislation to the international framework and the German legislation.

All three frameworks are far from perfect and struggle with certain issues. While the biggest problem of the international framework is the lack of contracting

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<sup>570</sup> section 34(1) *Atomgesetz*, see chapter 4.3.6

<sup>571</sup> Kgomo op cit (n469) 7

<sup>572</sup> see for example Davies op cit (n6) 25, who describes nuclear energy as ‘a clean, safe, economical and reliable source of power’

<sup>573</sup> Fig op cit (n19) 59

states,<sup>574</sup> the German legislation is a model for a comprehensive nuclear liability regime with minor weaknesses. However, according to certain studies the amount of financial security provided in the German legislation is still not adequate compared to the extent of a potential accident.<sup>575</sup>

Comparing the South African legislation with the two latter ones, the most striking issue is the fact that South Africa is not a contracting state of any international nuclear liability convention. Although its legislation is in general aligned to international principles<sup>576</sup> and the suitability of various conventions was already reviewed in 2010,<sup>577</sup> South Africa has not signed any convention. Such an accession would also help to improve the deficits of the existing legislation, which consists mainly of provisions, which are too uncertain and unpredictable and leave too much discretion to the Minister of Energy.

In accordance with the IAEA,<sup>578</sup> the study therefore recommends to join the relevant international nuclear liability conventions. The Convention on Supplementary Compensation could be a start, as it does not require as much adjustment as the Vienna Convention and its scope is limited to contracting states.<sup>579</sup> However, Germany's approach to implement the relevant convention literally into the domestic law and, thus, making it directly applicable, would be an idea to consider. Such a solution would save the long process of aligning all the domestic legislation and, thus, the South African government could be sure to have a well-developed and mature nuclear liability regime in place. Such considerations are highly recommended before expanding the existing nuclear liability regime.

Bearing in mind the findings in the German legislation chapter and financial security cover, the general profitability of nuclear energy should be reconsidered. Although all the amounts of liability and financial security have been increased, they are still

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<sup>574</sup> by 2014 249 of 435 nuclear reactors (57 per cent) were still not covered by any international nuclear liability convention, see Davies op cit (n6); this figure is not up to date, as especially the USA and Japan have recently joined the Convention on Supplementary Compensation

<sup>575</sup> see chapter 4.4

<sup>576</sup> Davies op cit (n6) 35

<sup>577</sup> IAEA op cit (n532) 29

<sup>578</sup> IAEA op cit (n532) 29

<sup>579</sup> see chapter 3.3.2.4

not sufficient, neither in the progressive German framework nor in the international convention or in the South African legislation. Bearing in mind these huge potential costs and the insurances, which would have to be maintained, the promotion of nuclear energy as a cheap energy resource, especially in South Africa, must be considered quite critically. Statements like

‘[n]uclear is very expensive to build but once you’ve paid it off, the plant lasts 60 years versus 25 to 50 years for coal. Koeberg is Eskom’s cash cow because it’s paid off and costs very little to run’<sup>580</sup>

from the former CEO of the South African Nuclear Energy Corporation, Dr Rob Adam, must be confronted with the findings of the examined study.<sup>581</sup> If the real risks and costs of the production of nuclear energy are taken into account, nuclear energy is an unprofitable nuclear resource. Countries should not make the mistake to exploit their insufficient legal frameworks to use cheap, but dangerous energy at the expense of the health of their people and their environment.

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<sup>580</sup> at the South African National Energy Association meeting, June 2015, available at [http://www.engineeringnews.co.za/article/nuclear-energy-a-secure-option-for-south-africa-2015-06-25/rep\\_id:4136](http://www.engineeringnews.co.za/article/nuclear-energy-a-secure-option-for-south-africa-2015-06-25/rep_id:4136) accessed on 17 December 2017

<sup>581</sup> Versicherungsforen Leipzig op cit (n429): Although assessing the figures of the study a little bit too high, the Chernobyl accident painfully demonstrated the costs of a nuclear incident. The proposed NNRA-REG would not cover the cost of the Chernobyl accident not even nearly

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