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THE PRESENT AND FUTURE PROSPECTS OF MALAYSIA'S ATOMIC ENERGY LICENSING ACT 1984 (ACT 304) ON NUCLEAR LIABILITY

Suziana Masni Majid[1+]
Salawati Mat Basir[2]

[1,2]*Faculty of Law, Universiti Kebangsaan Malaysia, Malaysia.*
[1]*Email: suzianamajid75@gmail.com*
[2]*Email: salawati@ukm.edu.my*

(+ Corresponding author)

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ABSTRACT

Initially, the Government of Malaysia (GOM) agreed to consider deploying nuclear energy as an alternative source of energy in Peninsular Malaysia and planned to build a 2 gigawatts nuclear power plant (NPP) to be operational post 2030. However, after the 2018 General Election (GE), the GOM decided that it will no longer proceed with its nuclear energy program. Despite the GOM's decision, there is a necessity to further strengthen the Atomic Energy Licensing Act 1984 (Act 304) particularly regarding nuclear liability issues. Nuclear incidents are transboundary in nature, it can easily spread highly radioactive materials into the environment through water and air, and cause damage to neighboring States. Therefore, this paper aims to explore Act 304, its present and future prospects in dealing with nuclear liability issues. References shall be made to the principles of the global nuclear liability regimes (liability regime). This paper finds that the provisions of Act 304 are consistent with the principles of the liability regime such as the definition of important terms like "nuclear damage", "nuclear incident" and "nuclear installation"; "strict and exclusive liability"; liability limited in amount and time; compulsory financial security; and exoneration. Nonetheless, there are also several shortfalls in Act 304. As for the future prospect, this paper hopes that Act 304 will be amended in accordance with the revised liability regimes which provide enhanced protection to the people, their property and environment. Furthermore, Malaysia should also consider adhering to the liability regime.

Contribution/ Originality: This study contributes in the existing literature regarding nuclear liability from Malaysia's perspective by conducting comparative analysis between Malaysia's Act 304 and the liability regimes. This paper's primary contribution is the finding that Act 304 is consistent with the principles of liability regimes.

1. INTRODUCTION

The enabling legislation that regulates the peaceful use of nuclear energy and technology in Malaysia is the Atomic Energy Licensing Act 1984 (Act 304). The Act 304 came into force on 28 June 1984 and has never been amended since it came into force. Although Malaysia has not adhered to any global nuclear liability regime (liability regime), and only possess a one (1) megawatt (MW) nuclear research reactor, TRIGA PUSPATI Reactor (RTP), Part IX of Act 304 (sections 42 – 65) deals extensively with issues concerning liability. The majority of the provisions in Part IX are consistent with the principles of liability regime particularly the Vienna Convention on Civil Liability for Nuclear Damage 1963 (the Convention) such as the definition of the terms "nuclear damage",

"nuclear incident" and "nuclear installation" (section 2); "absolute and exclusive liability" of an installation operator (section 45); exceptions to liability of an installation operator (section 46); limiting the liability amount per nuclear incident (section 59); installation operator to secure and maintain financial security to cover his liability for nuclear damage (section 60); and the time limit to bring an action for nuclear damage (section 63). Initially, the Government of Malaysia (GOM) agreed to consider deploying nuclear energy as an alternative source of energy in Peninsular Malaysia and planned to build a two (2) gigawatts nuclear power plant (NPP) to be operational post 2030 (Economic Transformation Programme (ETP), 2010; Official Parliamentary Statement, 2016). However, after the General Election (GE) on 9 May 2018, the GOM decided that Malaysia will no longer proceed with its nuclear energy program and will continue to depend on its available fuel sources like "fossil fuel; coal; hydroelectric dams and wind power" for the purpose of electricity generation (NST Online, 2018; Star, 2018). Despite the GOM's decision not to proceed with its nuclear energy program, there is a necessity to further strengthen the nuclear legislation, Act 304 particularly on nuclear liability issues. According to Cook (2013) "a nuclear incident can cause damage of substantial magnitude which effects the people, property and the environment. The potential effects of a nuclear incident do not respect State borders and may extend into neighboring States, far beyond the territory where the nuclear incident occurred". Thus, nuclear incidents are transboundary in nature, it can easily spread highly radioactive materials into the environment through water and air, and cause damage to neighboring States (Heiss, 2011; Heffron *et al*., 2016). Although Malaysia only has a research reactor and does not intend to proceed with its nuclear energy program, nuclear liability does not only concern about nuclear incident originating from an NPP situated in Malaysia. It also includes nuclear incidents originating from NPP located in another State and can cause "transboundary nuclear damage" to Malaysia. The best example is the accident that occurred at the Fukushima NPP in 2011, where there was a heightened concern by the Malaysian public regarding the radiation level caused by the nuclear accident in Japan (Mishar *et al*., 2011). In response to this concern, the Atomic Energy Licensing Board (AELB) as the regulatory authority and the lead agency for any nuclear and radiological disaster has mobilized its National Radiological Emergency Centre (NREC) to monitor the radiation level in Japan and whether it has any negative impact on Malaysia (Directive No 20, 1997; AELB, 2011). AELB also provided several types of services like providing updates on the contamination level at the Fukushima NPP; screening of passengers whom returned from Japan at major international airports; providing information on the assessments made to the environment and radiation levels in Malaysia to the media; as well as monitoring food stuff originating from Japan (Teng, 2014). Malaysia was fortunate that after much testing and monitoring conducted by AELB, it was found that the Fukushima nuclear accident did not pose any radiological impact to Malaysia (AELB, 2011). Furthermore, there is an emerging trend among ASEAN Member States (AMS) such as Indonesia; Vietnam; Thailand; and the Philippines that are "moving towards diversifying their energy mix, reducing their over-dependence on fossil fuels" and pursuing nuclear energy program for the purposes of electricity generation in their respective States (Caballero-Anthony *et al*., 2014). ASEAN comprises of States that are in close proximity by way of land and sea therefore, a nuclear incident in one AMS is bound to have catastrophe effect on the other AMS, similar to the Chernobyl nuclear accident in 1986. where its "radioactive plume" caused extensive damage to its neighboring States (Birnie *et al*., 2009; Mohan, 2015). Abraham (2014) stated that since "there is no legal or treaty obligation within the ASEAN region regarding nuclear liability and compensation, therefore it is important that early discussion on this issue be conducted amongst AMS before the operation of an NPP in this region". Therefore, based on the reasons mentioned above, there is a necessity for Malaysia to look into Act 304 regarding nuclear liability issues.

2. METHODOLOGY

This paper adopts a pure legal research methodology which is qualitative in nature. The researchers have conducted extensive library and on-line database searches for primary and secondary sources. This paper used the

critical analysis approach which focused on the doctrinal and comparative analysis between the Act 304, particularly Part IX and the liability regimes.

3. PRINCIPLES OF LIABILITY REGIMES

Basically, there are 2 liability regimes which are based on numerous identical principles namely:

(i) The Paris Convention on Third Party Liability in the Field of Nuclear Energy 1960 ("Paris Convention"), which is under the purview of the Organization for Economic Cooperation and Development (OECD). The State Members recognized that the liability amount was insufficient to pay for compensation, Therefore, in 1963 the Brussels Supplementary Convention was adopted and followed by the adoption of 2 more protocols in 2004 namely the Brussels and Paris Protocol (NEA, OECD Official website).

(ii) The Vienna Convention 1963, a world-wide instrument under the purview of the International Atomic Energy Agency (IAEA) and its membership is open to all United Nations (UN) States. Furthermore, in 1997 the IAEA adopted 2 further instruments namely the Protocol to amend the Vienna Convention on Civil Liability for Nuclear Damage 1997 ("1997 Protocol") and the Convention on Supplementary Compensation for Nuclear Damage ("CSC") (IAEA Official website).

Suttenberg (2016) explained that the purpose of the liability regime is "to ensure that (1) adequate compensation exists if an accident occurs; (2) the rules regarding nuclear liability and compensable damage are clearly established before an accident occurs; (3) all potential victims – including victims in other countries -are able to get to the courtroom; and 4) all potential victims receive compensation in an efficient manner". In short, the liability regime intends to harmonize the interest of 2 different parties – firstly, to ensure that those who suffered damage will be compensated "promptly and efficiently" and secondly, to protect the nuclear industry from ruinous claims for compensation (Hanqin, 2003; Heffron *et al*., 2016).

Therefore, this paper aims to explore the provisions of Part IX of Act 304, its present and future prospects in dealing with nuclear liability issues. References shall be made to the principles of the liability regimes namely the Convention; 1997 Protocol; and CSC.

3.1. Definition of the Terms "Nuclear Damage", "Nuclear Incident" and "Nuclear Installation"

The liability regime is applicable "to liability for 'nuclear damage' which is caused by a 'nuclear incident' occurring in a 'nuclear installation' or in the course of transport of nuclear material to or from such a nuclear installation" (IAEA Explanatory Text, 2017). Therefore, the terms "nuclear damage", "nuclear incident" and "nuclear installation" are very important in order for the liability regime to be applicable (Handrlica, 2017). According to Stoiber *et al.* (2003) the liability regimes do not contain any provisions relating to causality between "a certain nuclear installation, a certain incident, and the nuclear damage suffered". Therefore, the national legislation of the State that has jurisdiction to hear the case shall determine the issue regarding causality (Stoiber *et al*., 2003).

3.2. Nuclear Damage

The Convention defines the term "nuclear damage" means "loss of life, personal injury and loss of, or damage to, property, and any other loss or damage to the extent that the law of the competent courts so provides" (Article 1(1)(k)). The 1997 Protocol introduced several new headings under "nuclear damage" for example "economic loss"; "environmental damage"; and "preventive measures" (Article 2(2)). As for CSC, the term "nuclear damage" is defined identical to the 1997 Protocol. As for Act 304, the term "nuclear damage" is defined almost identical to the definition under the Convention however, Act 304 includes "environmental damage" in its definition. Section 2 of Act 304 defines "nuclear damage" means "any loss of life, injury to the person, loss of use of, or damage to property, or loss in, loss of use of, or damage to the environment" (Section 2). The term "environment" as defined by Act 304 "shall have the meaning as assigned to it under the Environmental Quality Act 1974 and shall also include marine

environment" (Section 2). Furthermore, Section 48 of Act 304 provides that the GOM, the State Government, or both can claim for environmental damage depending on whether the damage is within the jurisdiction of the GOM, the State Government, or both. Therefore, the difference between Act 304 and the liability regime is that the term "nuclear damage" under Act 304 does not include "economic loss" and "preventive measures".

3.3. Nuclear Incident

The Convention defines "nuclear incident" means "any occurrence or series of occurrences having the same origin which causes nuclear damage" (Article 1(1)(l)). However, this definition has been amended by the 1997 Protocol to also include "preventive measures" where "the occurrence creates a grave and imminent threat of causing such damage" (Article 2(3)). The CSC has also adopted similar meaning for "nuclear incident" (Article 1(i)). Soljan (2000) explained that "the revised definition of 'nuclear incident' permits the taking of preventive measures even in circumstances where there is no release of ionizing radiation however, there must be a 'grave and imminent threat' of such a release". The courts shall determine whether the preventive measures taken are "reasonable" or not by taking into consideration "the nature and extent of the risk of nuclear damage involved; the extent to which such measures appeared likely to be effective at the time when they were taken; and also the relevant scientific and technical expertise" (IAEA, 2017). As for Act 304, the term "nuclear incident" has been defined similarly to the Convention which means "any occurrence or a series of occurrences, having the same origin, which causes or cause nuclear damage" (Section 2). Therefore, it would be better to amend the definition of "nuclear incident" under Act 304 in line with the 1997 Protocol and CSC, as it enables any person to recover the costs of "preventive measures", although the ionizing radiation is not released to the environment but there is "a grave and imminent threat" of such release.

3.4. Nuclear Installation

The term "nuclear installation" as defined by the Convention means "any nuclear reactor other than one with which a means of sea or air transport is equipped for use as a source of power; any factory using nuclear fuel for the production of nuclear material, or any factory for the processing of nuclear material including reprocessing of irradiated nuclear fuel factory; and any facility were nuclear material is stored, other than storage incidental to the carriage of such material" (Article 1(1)(j)). The 1997 Protocol has introduced several amendments to the definition of "nuclear installation" where firstly, the 1997 Protocol has inserted a new definition to include "such other installations in which there are nuclear fuel or radioactive products or waste as the Board of Governors of IAEA shall from time to time determine" (Article 2(1)(b)). The purpose of this amendment is to enable the inclusion of other categories of "nuclear installations" in the future. Secondly, the 1997 Protocol inserted a new provision stating where "low-risk nuclear installations" may be excluded from the Convention; however it is subjected to IAEA's criteria (Article 2(5)). Lastly, the 1997 Protocol clearly specifies that the Convention shall be applicable to the "nuclear installations used for peaceful purposes" (Article 3). The CSC has adopted a similar definition as provided in the Convention (Article 1, Annex). As for Act 304, the definition of "nuclear installation" is similar to the Convention which means "any nuclear reactor other than one equipped in sea or air transport as a source of power; any factory using nuclear fuel for the production of nuclear material; any factory using nuclear material for the production of nuclear fuel or adapted for processing nuclear material; or any facility where nuclear material is placed or stored other than storage incidental to the carriage of the nuclear material" (Section 2). Malaysia only has the RTP which is located in the Malaysian Nuclear Agency (Nuclear Malaysia), Selangor. The RTP started its operation in 1982 and is designed to enable the implementation of multiple types of basic nuclear research; personnel training and also the production of radioisotopes (Malaysian Nuclear Agency). The RTP falls within the definition of "nuclear installation" under Act 304.

3.5. Strict or Absolute Liability

The Convention specifies that the liability of an installation operator shall be strict or absolute for damages due to "a nuclear incident occurring at its nuclear installation or during the course of transport of nuclear substances to or from the nuclear installation" (Articles II and IV).

The advantage of the "strict or absolute liability principle" is that claimants do not have to establish that the installation operator was "negligent or intentionally breached the duty of care" towards him. The claimant only has to show the "causation and damages suffered" to obtain compensation (Suttenberg, 2016). This approach is different from the tort law where the claimant needs to establish that the defendant owes a "duty of care towards the plaintiff; there was a breach of duty either by way of negligence, intentional act or omission by the defendant; and as a result, the plaintiff suffered damage" (Schwartz, 2010). The strict or absolute liability is also provided under section 45 of Act 304 where it specifies that "the liability of the installation operator for any nuclear damage shall be absolute".

3.6. Exclusive Liability

The "exclusive liability" principle is also similar to the "strict or absolute liability" principle under the Convention where the installation operator shall be exclusively liable in circumstances where the incident takes place either in the nuclear installation, or during the transportation of the nuclear material to or from the nuclear installation (Articles II(1) and (5)). Boyle (2005) explained that the advantages of "exclusive liability" principle from the victim's perspective is that it makes it easier for him to identify the defendant and it is assumed that the installation operator or owner of the nuclear installation shall be "in the best position to exercise the effective control of the nuclear installation or ship, and to ensure it". Furthermore, according to Schwartz (2010) the "exclusive liability" principle enables the contractors, manufacturers and suppliers who are involved in the "planning, construction or operation of a nuclear installation" to avoid from being sued in courts or from procuring expensive liability insurance. Nonetheless, there are some States that apply the "exclusive liability" principle in a different manner. For example, the United States of America (US) under the "Price-Anderson Nuclear Industries Indemnity Act 1957" (PAA) adopts the "economic channeling" rather than the "legally channeling" (Faure and Borre, 2008). The PAA defines "public liability" means "any liability arising out of or resulting from a nuclear incident or precautionary evacuation" (Dobbins, 2019). Based on the definition of "public liability", installation operators and any other persons like suppliers are liable however, the supplier's liability is channeled to the installation operator and is indemnified by his insurance coverage (Faure and Borre, 2008; Dobbins, 2019). Therefore, the "economic channeling" adopted by US is in contrast with the "exclusive liability" principle under the liability regimes (Swartz, 2016).

Another example is India's "Civil Liability for Nuclear Damage Act 2010" (CLNDA) where some argued that the provisions of the CLNDA are inconsistent with the CSC (Abraham, 2014; Bellamy, 2019). The CLNDA provides that "the installation operator's right of recourse against a supplier when the nuclear incident has resulted as a consequence of an act of the supplier or his employee, which includes the supply of equipment or material with patent or latent defects or sub-standard services" (Section 17(b)). As a result, each supplier is required to possess a financial security in the amount equivalent to the liability amount retained by the installation operator as prescribed under the CLNDA (Section 6(1)).

This approach cause concerned to both foreign and local suppliers as it will burden them financially (Abraham, 2014). In order to address this concern, Bellamy (2019) explained that the Government of India has made efforts to convince the foreign and local suppliers that section 17(b) "is not a mandatory but an enabling provision and only applies where the operator includes a right of recourse in its contract with supplier". Some are of the view that the CLNDA is a "flawed legislation" (Bellamy, 2019). Nonetheless, there are some writers that agree with section 17(b) of the CLNDA where it imposes liability on the suppliers other than the installation operators, as the time has come to reform the liability regime and the CLNDA may be the "way forward" in dealing with this issue (Heffron *et al.*,

2016). The "exclusive liability" principle is also provided in Act 304 where "no other person other than the installation operator shall be liable for any nuclear damage" (Section 45(2)). Although both the liability regime and Act 304 clearly specifies that the responsibility for nuclear damage shall lie "exclusively" on the installation operator, there are 2 instances where he can be exempted – firstly, where "it is expressly provided for in a written contract"; and secondly where "the incident resulted from an act or omission done with intent to cause damage, against the person responsible" (Article X of the Convention; Section 47(1) of Act 304).

3.7. Liability is Limited in Amount

According to Radetzki (1999) "under the law of tort, there is no limitation as to the amount of compensation payable to the victim for the damage caused by an accident. Therefore, any person found liable will have to pay the full amount of judgement or settlement". On the other hand, States that wish to broaden their nuclear energy industry shall have to relieve the installation operators from costly claims and enact national laws to limit their liability for nuclear damage (Schwartz, 2010).

Before the Chernobyl nuclear accident in 1986, the Convention provides that the "liability amount of an installation operator shall not be less than US5 million for any one nuclear incident" (Article V(1)). After the Chernobyl nuclear accident, the international community decided to increase the liability amount under the liability regimes as the current amount was inadequate to compensate the victims for the damages incurred (Birnie *et al*., 2009). As a consequence, the IAEA adopted the 1997 Protocol and increased the liability amount where the Installation State can either "limit the amount of liability of the installation operator to not less than 300 million Special Drawing Rights (SDRs); or to an amount of at least 150 million SDRs, provided that the Installation State makes public funds available to compensate damage in excess of that amount up to 300 million SDRs" (Article 7(1)).

The CSC comprises of first tier and second tier of compensation. The first tier guarantees that 300 million SDRs or a greater amount is made available by the Installation State (Article III(1)(a)). The second tier comprises of an "international fund" contributed by all Contracting Parties in circumstances where the damage is more than the amount provided in the "first-tier". The amount for the "international fund" shall be about 300 million SDRs. All nuclear power States shall contribute 90% to the "international fund" and the balance shall come from other Contracting Parties based on their UN rate of assessment (Article IV(1)(a)).

With regard to the requirement to make contributions to the international fund, Article IV(1)(b) of CSC provides that not all Contracting Parties are required to make contributions especially those States that do not possess an NPP and are on the minimum UN rate assessment (Mc Rae, 1998). Therefore, if Malaysia decides to accede to the CSC, it may not have to make any contributions to the international fund as it only possesses a one MW thermal power nuclear research reactor and may benefit from the international fund.

The Act 304 specifies that the liability amount of an installation operator shall be RM50 million per nuclear incident (Section 59(1)). However, the Board may prescribe a lower amount of not less than RM12 million per nuclear incident (Section 59(2)). The liability amount of RM50 million per nuclear incident under the Act 304 is too low and is inadequate to compensate for nuclear damage. Therefore, Malaysia should consider increasing the liability amount under Act 304 to guarantee that there are sufficient monies to compensate the victims of a nuclear incident.

3.8. Compulsory Financial Security

The Convention specifies that an installation operator is required to possess a financial security to cover his liability. If the liability is unlimited, the amount shall not be less than the minimum liability amount provided under the liability regime which the State has become a party to NEA OECD (2014). The purpose of maintaining a financial security is to guarantee that the victims will obtain their compensation payments, and that the installation operator has adequate monies to pay compensation to the victims (Stoiber *et al*., 2003).

According to Schwartz (2010) the financial security can be in the form of "bank guarantee; self-insurance or even a guarantee or indemnity provided by the Installation State where the nuclear installation is located". On the other hand, if the financial security is insufficient to compensate the victims, the Installation State shall make available public funds up to the liability amount of the installation operator, or if the liability is unlimited, up to the coverage amount (Stoiber *et al.*, 2003).

Section 60 of Act 304 provides that the appropriate authority shall only issue a license under Act 304 if the installation operator or any other person possess an insurance or other financial security to cover his liability for nuclear damage (Section 60(1)). The insurance or other financial security may be in the form of "private insurance, private contractual indemnity, self-insurance, or a combination thereof" as determined by the Board (Section 60(2)).

3.9. Liability in Time

The Convention provides that the time period to bring a claim for nuclear damage is "10 years from the date of the nuclear incident" (Article VI(1)). This period originated from the preparedness of the insurance industry to insure for the period of 10 years only and no longer. Reitsma and Tetley (2010) explained that if the time period is longer than 10 years, it will be difficult for the victim to prove on whether he's illness was caused by the nuclear incident. Furthermore, there is the likelihood that the insurance company will face some difficulties in the future such as bankruptcy or cessation, and as a result, it may be incapable of making compensation payments to the victims. Some writers argued that the 10 years' time period to make a claim was "too short" and that "some damages may be latent and may take time to develop or manifest itself" (Currie, 2006; Lamm, 2006; Handrlica, 2017). The 1997 Protocol has increased the time period to bring a claim to "30 years from the date of the nuclear incident for the loss of life and personal injury" and "10 years for all other damages" (Article 8(1)). Furthermore, the 1997 Protocol has deleted the provision relating to "the 20-year period of extinction for the rights of compensation relating to damage caused by an incident involving nuclear material which has been stolen, lost, jettisoned or abandoned" (Article 8(2)). IAEA (2017) explained that the reason for such deletion was because it was uncommon for those events to take place.

The CSC provides that the time period to bring a claim shall be within 10 years from the occurrence of the incident (Article 9(1), Annex). Swartz (2016) has criticized this time period under CSC as "too short for the radiological harms caused by nuclear damage and that time limits on the bringing claims should be eliminated entirely". However, unlike the 1997 Protocol, the CSC has retained the provision regarding "nuclear incident caused by nuclear material that were stolen, lost, jettisoned or abandoned" (Article 9(2) of Annex).

Under Act 304, the time period to bring a claim for compensation shall be 20 years from the occurrence of the incident (Section 63 (1)). The Act 304 does not make a distinction between the right of compensation between the "loss of life and personal injury" and "other damages", and Act 304 also has a similar provision as provided under the Convention regarding "nuclear incident involving nuclear material which has been stolen, lost, jettisoned or abandoned" (Section 64(1)).

3.10. Exonerations of the Installation Operator from Liability

The Convention provides that an installation operator shall not be liable in circumstances where such damage is caused by a nuclear incident which is directly due to " an act of armed conflict, hostilities, civil war or insurrection", or "a grave natural disaster of an exceptional character" (Article IV(3)(a) and (b)).

The Convention was amended by the 1997 Protocol by removing "a grave natural disaster of an exceptional character" from the list of causes of exoneration from liability (Article 6(1)). According to IAEA (2017) the reason for such exclusion is that technological progress has enabled the construction of nuclear installations which can resist any types of disasters, particularly disasters of "an exceptional character" like an earthquake.

A good example is the Fukushima accident, where the Government concluded that "the 9.0 magnitude earthquake and tsunami that occurred on 11 March 2011 did not amount to 'a grave natural disaster of an exceptional character' as neither of the natural disaster were unforeseeable nor far beyond the design basis for the reactors" (Osaka, 2012). Osaka (2012) explained that "a grave natural disaster of an exceptional character" means "a great earthquake, volcanic eruption, wind and water disaster, or other type of natural disaster on a scale that generally had never been seen in history. This exemption is limited to an event of force majeure of an extraordinarily high degree, it will be unforeseeable, and must be far beyond the design basis for a reactor". Therefore, it was concluded that Fukushima nuclear accident does not amount to "a grave natural disaster of an exceptional character" as the natural disaster was "foreseeable" and "not far beyond the design basis for reactors" and therefore, TEPCO shall not be exonerated from liability (Osaka, 2012; Lerner and Tanzman, 2014).

Moreover, the 1997 Protocol has amended Article IV(5) of the Convention where "an installation operator shall not be liable for nuclear damage to the nuclear installation itself and any other nuclear installation, including a nuclear installation under construction on the site where that nuclear installation is located, and to any property on that same site which is used or to be used in connection with any such installation" (Article 6(2)). Schwartz (2010) explained that the reason for such exception is to avoid the installation operator from using the financial security maintained to pay for the damage sustained to his property and this shall affect the rights of any third parties to claim for compensation. The installation operators are compelled to accept whatever risk for loss of, or damage sustained to their own property. With respect to exceptions to liability, Section 46 of Act 304 is similar to the exceptions under the Convention. Section 46(1) of Act 304 provides that "no person shall be liable for any nuclear damage caused by a nuclear incident directly due to an act of armed conflict, hostilities, civil war, insurrection, or a grave natural disaster of an exceptional character" and that "an installation operator shall not be liable for nuclear damage to the nuclear installation itself or to any property on site of the nuclear installation that is used or to be used in connection with the nuclear installation; or to the conveyance in which the nuclear material involved was carried out at the time of the nuclear incident" (Section 46(1) and (2)).

Malaysia is fortunate that its geographically located outside of the "Pacific Rim of Fire" however, Malaysia is susceptible to other types of disasters such as "floods; mudslides; forest fires; tsunami; cyclonic storms; landslides; seismic activity; epidemic; and haze" (Malaysia Disaster Management Reference Handbook, 2016; Sobian, 2016). Thus, Malaysia may want to consider removing the exception "a grave natural disaster of an exceptional character" from Section 46(1) of Act 304, as an installation operator must ensure that their nuclear installation can withstand "any natural disasters including those that are of exceptional character" (IAEA, 2017).

4. SHORTCOMINGS

There are a few principles under the liability regimes that have not been incorporated into Part IX of Act 304 which are as follows:

4.1. Exclusive Jurisdiction of One Competent Court

Each Contracting Party shall guarantee that only one court in its State shall have the jurisdiction to hear and determine case relating to compensating nuclear damage (Article XI of the Convention). Boyle (2005) explained that the reason of having one single competent court is "to create legal certainty and to avoid victims of the nuclear incident from submitting their claims in States where their claims are more likely to receive favorable treatment, also known as 'forum shopping'".

4.2. Courts to Recognize and Enforce Judgement

The final judgement of a competent court shall be recognized and enforced except in circumstances where "the judgement was obtained by fraud; where the party against whom the judgement was pronounced was not given a fair opportunity to present his case; or where the judgement is contrary to the public policy of the Contracting Parties or not in accordance with the fundamental standard of justice" (Article XII(1) of the Convention).

4.3. Non-Discrimination and Priority Principles

With regard to the "non-discrimination principle", the Convention specifies that "the Convention and national law shall be applied without discrimination based on nationality, domicile or residence" (Article XIII of the Convention). The purpose of this "non-discrimination principle" is to guarantee that victims from another State shall be treated equally like the victims in the State where the nuclear incident occurred (Stoiber *et al.*, 2003).

The "priority principle" means priority shall be given to claims relating to "loss of life or personal injury" when it comes to the distribution of compensation payments to the victims (Article 10(2) of 1997 Protocol). It shall only be applicable to claims submitted within 10 years from when the nuclear incident occurred and not after that such period, and also when the compensation amount exceeds the liability amount provided under the Convention (IAEA, 2017). According to Mohan (2015) "in case of loss of life and personal injury, the most affected State will receive a priority in obtaining compensation, while others may have to wait or may not get it at all". Therefore, this "priority principle" is actually a discriminatory disbursement regime of compensation between the States which is inconsistent with the "non-discrimination" principle.

5. FINDINGS AND CONCLUSION

Based on the discussion above, it can be concluded that presently, most of the principles under the liability regime has been addressed and incorporated into Part IX of Act 304. The majority of the provisions of Act 304 are similar to the Convention, since Act 304 came into force in 1984, and until today, it has never been amended.

Therefore, with regard to the future prospects of Act 304, this paper would like to suggest that Act 304 be amended in order for it to be consistent with the revised liability regime namely the "1997 Protocol" and "CSC", as both of these conventions provide a better and enhanced protection to the people, their property and the environment. This paper would like to suggest the amendments of the following areas:

(a) The term "nuclear damage" to be defined as including "economic loss" and "preventive measures". Moreover, the term "nuclear incident" should also be amended to include "preventive measures" as to enable victims to claim for "preventive measures" costs.

(b) Limitation of liability in amount should be increased. Currently under Act 304, the liability limit is RM50 million per nuclear incident and such liability amount is too low and insufficient to compensate victims.

(c) Liability period should be increased from 20 to 30 years for the "loss of life and personal injury" as it takes many years for a victim to become ill due to being exposed to radiation.

(d) Exoneration from liability caused by a "grave natural disaster of an exceptional character" should be taken out from the exceptions from liability as nuclear installations are expected to resist any type of disasters, including disasters of "an exceptional character".

Furthermore, this paper would also like to suggest Malaysia to consider adhering to the revised liability regime especially the CSC, as it provides supplementary funds in cases where the installation operator and the State funds have been exhausted. It is important to point out that before Malaysia can become a party to the CSC, there are 2 prerequisite conditions that Malaysia needs to fulfilled – firstly, Malaysia needs to ensure that the provisions of Part IX of Act 304 is line with "the Annex, CSC"; and secondly, Malaysia needs to join the Nuclear Safety Convention (CNS) as Malaysia possess a nuclear research reactor, the RTP.

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