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THE NECESSITY OF LAWS ON THIRD-PARTY AND CIVIL LIABILITY FOR INDUSTRIAL NUCLEAR DAMAGES CAUSED BY INSTALLATIONS: HEALTH ASSURANCE COMPENSATION

Yashinda Bandara Dissanayake[1]

Department of Legal Studies, Faculty of Humanities and Social Sciences, Open University, Nawala, Sri Lanka[1]

ABSTRACT

With the modern requisites of humankind, energy has become the most depleting resource due to waste and lack of sources. In the present world, nuclear energy sources play a vital role in producing energy by fueling radioactive elements. The most significant feature of atomic energy is that a small amount of radioactive substances can release a tremendous amount of energy. Most developed and developing countries use nuclear energy as a power-making resource for public and private purposes. Therefore, it is imperative that a developing country like Sri Lanka adopt nuclear power technologies and the laws governing nuclear operations. This research discusses international nuclear laws and the need for a legal framework to manage the liability of nuclear damages in terms of people's health and potential harm to health, past experiences of exposure to ionizing radiation are discussed with statistics to find out the necessity of laws on nuclear liability in terms of health compensation. The scrutiny supplies a directive authority to make domestic legislation without being dependent on international instruments, as the paper also discusses the drawbacks of international nuclear liability regimes against principles of nuclear law and the essentials of a nuclear liability regime. The primary objective of the study is to find out directive measures for a nuclear liability regime in terms of health assurance. In addition, this research also discusses directive principles to make equitable compensation liability schemes from the victims' perspective. The books, research papers, international conventions, and domestic legislation were the primary sources of the research. Sri Lanka's legal framework needs improvement as an independent law, aligning with the Vienna Convention on nuclear liability, as international law lacks equitable aspects.

KEYWORDS: N*uclear Law, Ionizing Radiation, Nuclear Liability, Strict Liability, International Law*

Corresponding Author: Yashinda Bandara Dissanayake, Email: yashindad@gmail.com

https://orcid.org/0009-0007-2094-2766

1. INTRODUCTION

All humanity is from an ancient civilization, and even before that, they needed power to continue their lives. During the initial period, humans could not be provided with power. Nevertheless, after the discovery of fire, humankind gradually developed different power sources.

The idea of nuclear power began in 1930 after the discovery of the scientist Enrico Fermi, the ability of neutrons to split atoms. With that great discovery, of nuclear power came into discussion and there was a great interest from the scientists on that. Enrico Fermi, with a team at the University of Chicago, could make the first chain reaction. Fermi's test was possibly not the first chain reaction. It was the first time scientists could make it happen in a lab by themselves. They could understand that the atoms can release the energy stored in the center of the atom, generally called the nucleus, by splitting. This process called "nuclear fusion," converts the stored energy to the energy of heat, correspondingly there emerges the energy conservation law. As the next step, the produced heat is directed to a cooling agent, and after a process of a turbine (which is not mentioned here), the process makes electricity. It is vital to understand that only the atoms of radioactive elements can be used as splitting ones. For example, Uranium, Palladium, and Polonium are radioactive elements used in power generation.

Radiation exposure can result in three different forms: natural, planned, or accidental. Since this paper aims to determine the third-party liability of transportation of radioactive substances and nuclear installations, it discusses about accidental radiation exposure.

1.1 What are Nuclear Damages?

The term "Nuclear damages" has been defined in the Vienna Convention on Nuclear Liability as "loss of life, any personal injury or any loss of, or damage to, a property which arises out of or results from the radioactive properties or a combination of radioactive properties with toxic, explosive or other hazardous properties of nuclear fuel or radioactive products or waste in, or of nuclear material coming from, originating in, or sent to a nuclear installation; (ii) any other loss or damage so arising or resulting if and to the extent that the law of the competent court so provides; and (iii) if the law of the Installation State so provides, loss of life, any personal injury or any loss of, or damage to, a property which arises out of or results from other ionizing radiation emitted by any other source of radiation inside a nuclear installation".

1.2 What is civil and third-party liability?

In litigation, civil responsibility is a legal duty that forces a party to pay for damages or to execute other court-enforced orders. In contrast to criminal responsibility, which is frequently filed by the State to correct a public wrong, civil liability or third-party liability is typically brought out by a private person seeking damages, injunctions, or other remedies against financial and bodily injuries or losses caused by any act of a responsible party. Most of the time, the terms civil liability and third-party liability are used synonymously.

E.g.: In a vehicle accident, the wounded individual can sue the driver and seek monetary compensation. In a nuclear disaster, the responsible person or the organization has the liability towards victims, and victims seek financial compensation.

2. METHODOLOGY

The scrutiny is based on the information, data, and knowledge gathered primarily and secondarily from statutes, reports, books, journal articles, and online written materials. The methodology used was doctrinal as the research takes a comparative analysis while providing a directive measure for the legal framework Sri Lanka needs. The area of discussion completely depends on the existing legal framework and the ideal law that would fit the current needs. Nuclear laws are completely written and the gaps and problems had to be found in such materials. The paper discusses the legal framework of Sri Lanka comparatively with the international legal framework on nuclear liability. As the modern method of energy creation, the need for laws on the nuclear regime has been recognized all over the world. Therefore, in the paper, the Sri Lanka jurisdictions are compared with the international legal regime.

3. RESULTS AND DISCUSSION

Considering the law related to nuclear affairs in Sri Lanka, nuclear matters are currently governed by the Sri Lanka Atomic Energy Act No. 40 of 2014. Further, there was no legal framework to manage nuclear liability in case of a nuclear disaster. For that reason, this research took place to evaluate the necessity of a legal framework for health issues that can be raised and to find out how to compensate for those health complications that can result from ionizing radiation in the event of nuclear damage happening to a nuclear installation. As a specific feature, the research was conducted to find out directive measures to make fair legislation to compensate victims of nuclear damage in terms of health damages. Therefore, the paper focused even on the drawbacks of the current international legal framework on third-party and civil liability in nuclear damage. The lack of legislation on atomic liability led to the need for conducting the research for this paper, and the lack of literature on similar topics became a motivational factor and a disadvantage in conducting the research.

3.1 International Nuclear Law

Nuclear law is "The body of special legal norms created to regulate the conduct of legal or natural persons engaged in activities related to fissionable materials, ionizing radiation, and exposure to natural sources of radiation" (Stoiber, 2003b).

With the principal objective of "to accelerate and enlarge the contribution of atomic energy to peace, health, and prosperity throughout the world", the International Atomic Energy Agency (IAEA) established its statute on October 23 1956 at the United Nations headquarters, New York. The same entered into force on July 29, 1957. Nuclear law is "The body of special legal norms created to regulate the conduct of legal or natural persons engaged in activities related to fissionable materials, ionizing radiation, and exposure to natural sources of radiation" (Stoiber, 2003). According to IEAE, the objective of nuclear law has been construed under the context of liability for nuclear damages. With the participation of the UN, IEAE on this matter promoted implementation and adherence; to a set of agreements and conventions on nuclear law. Such agreements and conventions which ensured the peaceful usage of nuclear power, are the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, the Convention on Nuclear Safety, the Joint Convention on the Safety and Spent Fuel Management and the Safety of Radioactive Waste Management. All that respectively discharged the duty to immediate notification in a nuclear accident which was adopted in 1986. That was after the Chornobyl nuclear accident. The cooperation of state parties assisted in nuclear accidents, to ensure a high level of safety on land-based nuclear power plants, and the joint convention addressed the issues in spent fuel and radioactive waste management for the first time.

Convention on Early Notification of a Nuclear Accident established a system for notification in the event of nuclear damage as the primary objective. The Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency made a framework to assist immediately the victims in the event of a nuclear accident. The parties are bound to assist such victims regardless of the nationality of the victim. The state parties that subscribed the Convention on Nuclear Safety are bound to make safety measures in nuclear practice. The Joint Convention on the Safety and Spent Fuel Management and on the Safety of Radioactive Waste Management provides a framework to manage spent fuel in nuclear installations and the wastage of the installation. Participation of IEAE is appreciable in the internationally binding legal framework through treaties under the auspices of IEAE, agreements to which IEAE is a party, and IEAE-related treaties (*Treaties*, n.d.).

The treaties under IEAE auspices are the Agreement on the Privileges and Immunities of the IAEA, which was established on the 1st of July 1959, and it contains provisions for the settlement of disputes, use of laissez-passer, abuses of privileges, immunity and privileges of officials, representations of members, facilities in respect of communications, property, funds, and assets of the agency and juridical

personality of the agency. In addition to the treaties mentioned in the previous paragraph, Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Convention on the Physical Protection of Nuclear Material, Amendment to the Convention on the Physical Protection of Nuclear Material, 1963 Vienna Convention on Civil Liability for Nuclear Damage contains provisions on civil liability of nuclear damages. That aim to ensure compensation for damages caused by nuclear installations and transportation, the optional protocol to Vienna convention, protocol to amend Vienna convention, Joint Protocol Relating to the Application of the Vienna Convention, and the Paris Convention and Convention on Supplementary Compensation for Nuclear Damages. The Joint Protocol ensures that only one of the two conventions applies to any given nuclear incident and that both the liable operator and the amount of its liability are determined by the convention to which the State whose territory the liable operator's installation is located is a party. The Joint Protocol applies not only to the original Paris and Vienna agreements; it applies also to any changes to either convention that is in effect for a party to the Joint Protocol.

There are eleven (11) fundamental principles of international nuclear law, i.e. the safety principle, the security principle, the responsibility principle, the permission principle, the continuous control principle, the international cooperation principle, the transparency principle, the independence principle, the sustainable development principle, the compliance principle, and the compensation principle (Stoiber, 2003).

Safety is the predominant principle as the standard and primary requisite of using nuclear energy – the safety of the operators and third parties. Therefore, the laws imposed regarding nuclear operations shall be stringent, and they ensure the protection and safety of the general public from nuclear accidents and ionizing radiation which harm the health of the general public.

Considering the Security principle, most nuclear operations commenced with the national security and military activities of several powers such as the United States of America and the Union of Soviet Socialist Republics (present Russia). The laws shall be imposed under this particular principle to ensure the security of the people from accidental and intentional diversions from legitimate usage of nuclear materials. Simply, in military invasions and in terrorist attacks, the radioactive sources may be captured by opponent military regimes and may use the seeds in illegitimate and risky methods. This principle emphasizes making international, national, and subnational laws to prevent the unlawful use of radioactive sources and abandoned nuclear installations. In contrast, in the Russian invasion of Ukraine, both parties tended to attack atomic facilities and sources irrespective of the loss of security of persons from ionizing radiations. Correspondingly, regarding the security principle, IEAE has implemented several treaties on nuclear weapon usage. The "Law of Space" even emphasizes on non-establishment of nuclear weapons in the atmosphere or space.

Various governmental and non-governmental agencies use Responsibility Principle needs, Nuclear power and radioactive materials for scientific purposes, medical purposes, power generation, construction, etc. The problem arises as to how the responsible party in the event of an accident of nuclear installation or transportation can be determined. International nuclear law has identified and sorted out the problem by making the operator or/and the licensee the responsible person. This responsibility is a strict liability where the *mens rea* (offensive intention) is not accountable. According to the Vienna Convention on Nuclear Liability, the operator "concerning a nuclear installation, means the person designated or recognized by the Installation State as the installation operator". The liability acts are laid down in Article 2 of the Vienna Convention. Article 4 (1) of the same convention has established the rule of absolute/strict liability of the operator. Article 4(3) states the instances in which the operator is free from liability which should be covered under the security principle.

The permission principle says that nuclear operations shall obtain prior authorization from the regulatory bodies engaged in the process due to the risks involved. This principle is fundamental as the regulator can revoke authority whenever they realize

such radioactive materials' excessive, illegitimate, and unsafe use. The power given for such nuclear operations must be inspected, monitored, and regulated continuously to protect the most predominant fundamental principle of nuclear law, the safety principle. The regulator shall examine from time to time the adherence to the regulatory framework.

As per the Compensation Principle, Nuclear energy has the potential to do significant harm to people, property, and the environment, depending on a variety of technical considerations. Because preventative measures cannot eliminate the possibility of such injury, States are required under nuclear legislation to take precautions to offer sufficient compensation in the case of a nuclear disaster. The compensation regimes in international law are stated in Vienna and Paris Conventions.

The underlying idea is that economic and social progress can only be sustainable if the world's environment is safeguarded from destruction. It is instrumental in the nuclear sector since some fissile materials and sources of ionizing radiation can pose long-term health, safety, and environmental problems. It is instrumental in the nuclear industry since some fissile materials and sources of ionizing radiation can pose long-term health, safety, and environmental issues. Because of the extremely long lifespan of these materials, it is impossible to identify which present steps are required to sufficiently protect future generations in the very distant and unexpected future. One approach to applying the principle of sustainable development in the nuclear field has been to urge that the current generation do everything possible to ensure long-term safety, without limiting options for future generations or relying too heavily on long-term forecasts, which are unlikely to be accurate over the long timescales involved.

In monist states, the State is bound by international law without specific legislation passed by the local legislature, while in dualist countries, it needs to pass particular laws after the ratification of international treaties. However, whether the State ratified the treaties on liability, following international customary law, a state in which occurred nuclear accident is liable for the damages caused to other states due to the radioactive contaminations. When making national/ domestic laws, it should also comply with this principle to ensure international or customary law conformity.

It is sufficient to emphasize at this point that nuclear legislation lays particular emphasis on forming a regulatory authority, the judgments of which on safety problems are not subject to influence by businesses involved in developing or marketing nuclear energy. Given the enormous hazards inherent in nuclear technology, other interests must submit to the regulator's independent and professional judgment regarding safety.

The usage of nuclear energy commenced in military operations in World War 2. Therefore, the parties were in danger of leaked information about such a nuclear regime. The flourished nuclear law required transparency in nuclear operations to promote the peaceful use of nuclear energy. The government's responsibilities shall have utmost good faith in supplying accurate and relevant information to ensure the general public's safety from nuclear accidents and ionizing radiation harms.

Finally, as per the International Cooperation Principle, users of nuclear methods and regulators of nuclear activities must maintain strong contacts with colleagues in other countries and appropriate international organizations. Several variables influence the international dimension of nuclear energy. First, in the area of safety and the environment, the potential for transboundary impacts necessitates governments harmonizing policies and developing collaborative programmes to reduce the risks of damage to their citizens and territories, the global population, and the planet as a whole. Lessons learned in one State about enhancing safety can be highly relevant to improving the situation in other States. It is vital to improve the safety of nuclear activities and facilities worldwide that such lessons be promptly and widely shared. The use of nuclear material poses security dangers that transcend national boundaries. Terrorist risks, as well as concerns linked with illegal nuclear material trafficking and nuclear explosive proliferation, have long been recognized as

issues needing a high degree of international cooperation. Various international legal instruments have been enacted to codify states' duties in the nuclear area. Governments must comply with such responsibilities in good faith, and the wording of those instruments may limit lawmakers' authority in formulating national legislation on specific issues they cover. Fourth, the increasingly global nature of the nuclear sector, with frequent transfers of nuclear material and equipment across national boundaries, necessitates parallel and collaborative methods by both public and private organizations for adequate control. For these reasons, national nuclear energy law should include suitable provisions to encourage public and commercial nuclear energy users to engage in important international nuclear activities.

3.2 Drawbacks of International Legal Instruments

The 1963 Vienna Convention, which followed the Paris Convention on Civil Liability of 1960, unlike the Paris Convention, has broadly defined the term "Nuclear Damages," which was again defined more broadly by the 1997 Vienna Protocol. The liability of the nuclear operator is absolute with several exemptions like armed conflicts, civil uprisings, and grave natural disasters, which are subjected to the domestic law of the state party. Still, the maximum financial security needed from the nuclear operator is as low as 5 million USD. The Vienna Protocol again broadened the definition of nuclear damages, extending the claim period. The limit of liability brought up to 300 million SDR. Article 4 of the Paris Convention says the operator of the insurance company shall take the whole liability between 5-15 million USD. The exception in the Vienna Convention applies similarly to the Paris Convention. Both the Vienna and Paris Conventions say the jurisdiction of such nuclear damage lies on the State that the nuclear installation states. Notably, legislation on nuclear liability should not limit the liability amounts as a legislator or an international body cannot decide the value of a person's health and their lives, which should be an essential principle when drafting a nuclear liability regime.

The Vienna Convention does not define economic and environmental loss regarding nuclear damages. People may suffer health disadvantages directly and indirectly from ecological and financial losses, and on the other hand, economic and environmental loss could arise from health issues and deaths. Vienna Protocol has introduced environmental reinstatement under nuclear damages. Unfortunately, it is silent on compensation where the reinstatement is impractical. By comparing nuclear conventions with the European Directive of Liability, Directive 2004/35/EC requires operators to take restorative and preventive measures to safeguard the environment, which can harm human health where damage has already occurred. This requirement is also extended for imminent threats of such damage (Sands & Galizzi, 2010).

Vienna Protocol defines nuclear damages as "loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of that environment, and insofar as not included in subparagraph (ii)". It is crucial to note that the term 'significant' is not defined properly. Operators are likely to argue that there is always a certain level of radiation. Therefore, the definition should be amended to define the term 'significant' unambiguously. The Revised Vienna and Paris Conventions established provisions to confer exclusive jurisdiction to the State where the incident occurred. This complies with the legislative measures which must be adhered to in making nuclear liability laws. The Vienna Convention has imposed a ten-year period to claim nuclear damages, which is not an adequate period of time at all. As discussed in the previous topic, health issues may arise even after ten years, especially genetic disorders and cancers. Therefore, as mentioned in the Vienna Protocol, the legislature should focus on extending the period to at least 30 years.

3.3 International Instruments on Civil and Third-Party Liability

There are two main conventions regarding international civil and third-party liability instruments, i.e. the Vienna Convention and the Paris Convention. The principles settled by the International

Commission of Jurists (ICJ) required to establish environmental law in an international aspect and be liable for the ecological harm made transboundary. In the incident of the Chornobyl nuclear accident (1986), since the Union of Soviet Socialist Republics (USSR) had not ratified the Vienna Convention or Paris Convention, it was not subjected to ICJ, and due to its power exercised in the United Nations, the USSR did not compensate for the nuclear accident. After the incident, because of the non-reliable manner. Under these circumstances, the two conventions the two conventions were adjoined together by the Joint Protocol of 1988 by negating the bars to the parties to accept both conventions together. Previously, Western European countries only could become parties for the Paris Convention which was operated as a regional instrument while the Vienna Convention was a universal instrument. The parties to the Joint Protocol are bound by the Vienna Convention and the Paris Convention at the same time. The Brussels Supplementary Convention enhanced the scope of the Paris Convention. No state can become a party only to the Brussels Supplementary Convention without being a party to the Paris Convention (Bellamy, 2018).

Accordingly, eight international instruments on civil and third-party liability for nuclear damages exist. Those are the 1960 Paris, the 1963 Brussels Supplementary Convention, the 2004 Paris Convention (Protocol to 1960 one), the 2004 Brussels Supplementary Convention (protocol to 1963 one), the 1963 Vienna Convention on Civil Liability for Nuclear Damages, the 1997 Vienna Convention (protocol to amend 1963 one), 1997 Convention on Supplementary Compensation for Nuclear Damage, and 1988 Joint Protocol.

The Paris Convention is equipped with several Principles on third-party liability in the event of nuclear damages. Correspondingly, the operator of the nuclear installation will be liable for the damage caused by the facility itself and in the transportation of such radioactive substances that are needed for the nuclear installation. This liability is "strict" which means, the liability is on the operator, regardless of the intention. Therefore, the regulatory body needs the operator to submit security before commencing the operation in the nuclear installation. In addition, the Paris Convention established a compensation scheme for injury, death, environmental pollution, economic losses, and some degrees of loss of income due to the nuclear accident.

3.4 Health and Safety Risks of exposure to radiation

As a comprehensive definition as affirmed by the Agency for Toxic Substances and Disease Registry, "Radionuclides (or radioactive materials) are a type of chemical in which the nucleus of an atom is unstable (*Radionuclides | US EPA*, 2023). They accomplish stability By modifying the nucleus that can be referred. For example, Cesium, Cobalt, Iodine, Plutonium, Radium, Radon, Strontium, Thorium, Uranium, etc. can be referred. There are 38 radioactive elements, of which Uranium is widely used in nuclear power plants worldwide. In the context of transportation, "radioactive materials" are defined as any material with specific activity greater than 0.002 microcuries per gram. (United States Nuclear Regulatory Commission [USNRC, Reactor Concepts Manual], n.d.).

The effects of nuclear radiation can cause short and long-term diseases. Radiation sickness called Acute Radiation Syndrome (ARS) and skin injuries caused by radiation effects called Cutaneous Radiation Injury (CRI) are short-term effects. Long-term effects of radiation exposure are cancers, prenatal exposure, and mental distress can be resulted. (World Health Organization: WHO, 2023)

Excessive radiation exposure may damage living human cells and other organs that help the body function by affecting the genetic material called Deoxyribose Nucleic Acid (DNA). This exposure can make cancerous cells and tissues in the human body. A higher exposure dose or a higher exposure period to low radiation will harm the human body. The harm depends on several facts. Those are the type of radiation, the sensitivity of body cells, duration of exposure, the isotope, and individual characteristics of the person (*Radiation and Health*, 2023).

We saw in the Chernobyl accident that the damage caused by ionizing radiation was not limited to subjective territory. The damages extended far beyond regions as well to an extreme magnitude. Nuclear damage can mainly arise in nuclear power plant accidents, radioactive elements, and spent fuel transportation. However, the damages caused by radioactive waste are at a shallow level (*What Is Nuclear Waste and What Do We Do with It? - World Nuclear Association*, n.d.-b). Therefore, we should focus on discussing the damages that can occur in nuclear installations.

In the incident of Chernobyl, from 1986 to 2005, approximately 5 Million people were found around the contaminated area, which contained an accumulated whole-body average dose of 0.01 Gy ("Cancer Consequences of the Chernobyl Accident: 20 Years On," n.d.). In addition, researchers found an increased number of thyroid cancers and had shown the risk likely to cause cancers in the thyroid gland due to exposure to I-131 (Brenner AV, Mykola DT, Hatch M, n.d.[2011])

The radioactive isotopes released in nuclear installation accidents include Iodine-131, Cesium-134, and 137 (Cs). Also, Plutonium-239 and Strontium-90 (Sr) may be released in extreme-level accidents such as the Chernobyl nuclear accident in 1986 in Ukraine and Fukushima Incident. Iodine-131 generally affects humans via contaminated water, milk, or food items (World Health Organization: WHO, 2023). In addition, the I-131 contained dust is another way of affecting humans. I-131 can be cancerous to the Thyroid gland as the thyroid cannot distinguish non-radioactive Iodine and I-131, which is a radioactive isotope of Iodine. Cesium-134 and 137 also are fatal in terms of external and internal. External exposure to Sc-131 and 137 comes from touching the contaminated materials and walking on contaminated soil. Internal exposure can occur from breathing the dust contained with Cesium particles. In 2021, it was found that thyroid tumors in children exposed to Chernobyl nuclear accident have more DNA damage than in children born nine months after the accident (Morton LM, Karyadi DM, Stewart C, cn.d.[2021]).

The Fukushima nuclear accident in 2011 due to earthquakes followed by a tsunami made 4% of females exposed to contamination as infants, all solid cancer patients. Around 6% of females exposed as infants have breast cancer. 7% of males exposed to contamination as infants became leukemia patients. Unfortunately, 70% of females exposed as infants became thyroid cancer patients (Prentice, 2013).

3.5 Current Sri Lankan Legal Framework on Nuclear Relations

In the first place, the Atomic Energy Authority Act No 19 of 1969 governed the nuclear affairs of Sri Lanka until the introduction of Sri Lanka Atomic Energy Act No 40 of 2014. The Atomic Energy Act contained provisions for the establishment of the Sri Lanka Atomic Energy Board, issuance of the license, the establishment of the Sri Lanka Atomic Energy Regulatory Council with specific duties and powers, i.e. powers of the minister, responsibilities and functions of the board, conditions and duties of licensees, termination and appeals of license, safety and security of radioactive sources, import and export regulations of radioactive sources and waste, emergency plan, physical protection of radioactive materials, rules for mining and processing, funds of the authority, the safety of workers etc.

Correspondingly, section 3 of the Atomic Energy Act of Sri Lanka (hereinafter called "the Act"), promoting peaceful and safe use of nuclear energy is a primary objective of the authority. Section 10 discusses the Atomic Energy Regulatory Council's goals established by Section 9. The objectives are to promote the safety of the environment and people from radiation exposure, which is supported by section 13 too. Section 22 shows the rigidness of license issuance, which needed several safety requirements. The duty imposed on license holders by section 24 also promotes environmental and human safety. Section 86(2) (h) says that the minister can make regulations to compensate radiation workers for any injury. Considering all the Acts, even though there are essential provisions included in terms of nuclear practice and regulatory framework, and although there are objectives to adhere to the safety principle of

international nuclear law, there are no provisions regarding compensation for victims exposed to ionizing radiation. Even though there are certain documents to submit to get the license and for the renewal of the license such as the prior notification, practice intended, application for approval for importation, building plan in line with safety measures, proof of sufficient technically qualified staff, proof for adequate safety measures, emergency response plan, and application for the license of nuclear practice in the licensing procedure (Section 22 (1), Sri Lanka Atomic Energy Act of 2014), the Sri Lanka Atomic Energy Regulatory Council does not require insurance coverage or proof of back-up fund for compensation for third-party victims such as workers of the installation.

Sri Lanka is a state party to the Convention on Early Notification of a Nuclear Accident, Convention on Nuclear Safety, and Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency that are not included in the provisions to compensate victims.

4. CONCLUSION AND RECOMMENDATIONS

In making nuclear liability legislation and legal framework, a few key elements should be included granting justice to victims. Those are unlimited compensation in amount, absolute/ strict liability, equitable period of liability, responsibility of other responsible parties, neutral tribunal, backup fund, applicable law/jurisdiction, broad definition of recoverable damages, just standing and access to justice, rules on burden of proof and causation.

The compensation amount should not be limited. The discretionary power to decide the compensation amount should lie upon the courts as the State or a nuclear operator can choose not the monetary value of a person or their health. A problem may arise when the nuclear operator cannot get insurance for an unlimited value. The insurance coverage for third-party bodily injuries/ damages is unlimited in general insurance terms and principles. Therefore, it would lead operators to be responsible for safety measures. Otherwise, having insurance and limitations on compensations, the operator can insure for the entire liability and neglect the safety measures.

Absolute liability has to be governed as the nuclear operator should bear the strict liability. It is imperative to understand that in some cases like natural disasters, the government has to accept the liability proportionately with the nuclear operator, where damage to the nuclear installation happens even though the operator has followed necessary guidelines given in the event of a natural disaster, as the nuclear operator pays taxes to the government. An equitable period for nuclear damage claims shall exist as some diseases may be latent. The fair period should be decided by the court case by case, based upon the dose of radiation, the surroundings of the disaster, the size of the catastrophe, elements and isotopes used in the reactors, the nature of the people surrounding, distance from contaminated plant and especially on specialist advice given before the courts as an official recommendation.

A neutral tribunal is necessary as some radioactivity damages will not harm people physically. Focusing and granting judgments merely on physical impairments means nothing regarding nuclear damage as cited in *Merlin v. British Nuclear Fuels PLC* ([1990] 3 All ER 711, 720 -21, [1990] 3 WLR 383) and *Blue Circle Industries plc v Ministry of Defense* ([1998] 3 All ER 385). The legislature shall impose a regulatory requirement for a backup fund to show to get the license as an issue on insurance liability may occur in case of damage arising due to a third-party action on the insurance principle called "insurable interest". The strict liability principle still should exist for the operator. Therefore, the need for a backup fund is critical in this regard. Further, the applicable law should be the law of damaged areas. Many jurisdictions (parties to the Vienna Convention 1963) do not allow for consequent economic damages which must be recovered under the suggested legal framework.

Most importantly, some of radiation-exposed diseases are latent and cannot be identified immediately after a

nuclear disaster. Sometimes these diseases show symptoms a few years later from the nuclear accident. Radiation contamination can last for hundreds of years. Economic losses may not need such a long period to claim damages. Health and life have to be protected for at least 30 years of a period. The crucial point regarding the drawbacks of international conventions is that some of the provisions, as stated above, do not comply with essential elements of a nuclear liability regime.

Sri Lanka is a third-world country that tends to adopt nuclear facilities shortly. Therefore, legal regimes to govern such operations must be established – the Atomic Energy Act of 2014 covers licensing and other regulatory requirements. Also, we need a legal framework to control third-party and civil liability towards the general public, as ionizing radiation may cause several health problems. As a dualist country, Sri Lanka has to make domestic legislation to exercise international treaties which the State ratifies. Therefore, the Sri Lankan legislature shall consider making legislation in line with the Vienna Convention and domestic legislation without the drawbacks of international nuclear liability instruments, as stated in the very previous subtopic, "Drawbacks of international instruments". It is also crucial to note that the essentials of a nuclear liability regime, as mentioned in a subtopic, shall be involved in making a new legislation that fits Sri Lanka. Suggested directive measures may bring adverse results in nuclear investments. However, as "health is wealth", the local legislature should protect the general public following the state policy mentioned in the Constitution of Sri Lanka. The gap in Sri Lankan Law on nuclear liability has been discussed in the paper, and the Sri Lankan legislature shall introduce a separate legislation or an amendment to the present Sri Lanka Atomic Energy Act No.40 of 2014 which consists of the limits and methods of compensation in a radiation expose. The new law shall be rid of the drawbacks of the Vienna and Paris Conventions.

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