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EVALUATING THE LEGAL FRAMEWORK FOR NUCLEAR ENERGY

~ Dakshita

Nuclear energy is a form of energy released from the nucleus, the core of atoms, made up of protons and neutrons. This source of energy can be produced in two ways: fission – when nuclei of atoms split into several parts – or fusion – when nuclei fuse together.

Environmentally, nuclear energy is a more sustainable option than other energy sources. As mentioned previously it gives extremely low carbon emissions. Another noteworthy thing is it is a reliable baseload power- that unlike energy resources like sun,wind which are intermittent (depending on the weather conditions), nuclear energy is an independent source of energy.
According to the data given by IEA (International Energy Agency), 60 gigatons of CO2 emissions have been averted due to nuclear power, globally.
They also have high energy density, which means a smaller amount can create vast amounts of energy. Furthermore, for many countries - nuclear energy is a vital way to ensure a stable and secure domestic power supply, reducing reliance on energy imports.

Political Significance of Nuclear Energy

For a nation like India, Nuclear energy helps us reduce dependence and vulnerability to volatile fossil fuel prices and supply disruptions which are very essential for a developing economy.
India has the strategic goal to leverage its thorium reserves to achieve a long term energy independence. Nuclear energy encourages economic growth and development as creates jobs in construction, operation and maintenance, fostering skill development as well.

The evolution of Nuclear law in India

India's nuclear energy sector is governed by two legislative laws - One is *Atomic Energy Act 1962* and *Civil Liability for Nuclear Damage Act 2010.*

Atomic Energy Act 1962: It is a revolutionary act in the legislative history of India which promotes the peaceful use of nuclear energy. It provides a basic regulatory framework for all the activities related to nuclear programmes.
Now this includes producing, controlling, disposing, manufacturing and use of radioactive substances and related equipment.

The Act majorly taps on the central government through its provisions.
Through its sections 3-5: it focuses on centralization of power-:
The Central Government has the exclusive authority over all activities regarding nuclear energy.

- Produce, develop, use, and dispose of atomic energy and radioactive substances.
- Control mining and processing of uranium, thorium, or other prescribed substances.
- Prohibit or restrict private use or possession of nuclear materials for safety or security reasons.

Acquisition of Property (SECTIONS 6-9)- These sections clearly prescribe that the government can compulsorily acquire land, minerals, plants and materials related to atomic energy. It may regulate or prohibit additionally the construction or operation for any plant that makes or uses nuclear energy without its approval.

Research and Development (SECTIONS 10-13)
The government has the power to conduct experiments, surveys, and investigations related to atomic energy. It can also aid or establish institutions which are related to atomic energy.

Licensing and regulations (SECTIONS 14-17)
These sections talk about the handling, controlling, production and transportation of radioactive materials requiring licensing issued under this act.
The government will also set standards for handling, protection and disposal of radioactive waste, radio active hazards

Offences and Penalties (SECTIONS 18-25)

Stringent punishment is implied for unauthorized handling,possession and disclosure of nuclear information. There are many examples of illegal offences like illegal use or transfer of radioactive material, breach of secrecy regarding radioactive materials.

These are some significant provisions.

Atomic Energy (Radiation Protection) Rules, 2004

A separate framework was laid down under the Atomic Energy Act, 1962 for laying down the legal framework for radiation safety in India. It was laid down to ensure that all the activities involving ionizing radiation– whether they be used in medicine,industry, research, agriculture- are conducted with prioritizing the utmost safety of the public, the workers and the environment.

The provisions underscored in this cover a wide range of criteria like -:

- Authorization and licensing as to who can handle, transport, or use radioactive materials
- Safety standards- Maintaining the radiation level as per prescribed dose limit, monitoring the equipment and warning systems.
- Medical Surveillance- Regular medical check-ups of the radiation workers, reporting to AERB in case of over exposure.
- These rules have helped in strengthening the oversight mechanism and promote safe and responsible use of radioactive material.
- Additionally it helps align India's radiation safety standards with the International Atomic Energy Agency.

Civil Liability for Nuclear Damage Act, 2010 (CLND Act)

This Act came into being as before 2010, India lacked a comprehensive legal framework as for nuclear energy. The primary basis of the act was to establish a compensatory mechanism for the nuclear incident which had taken place. It was also set up to encourage foreign investments in India while also keeping into account public safety.

Provisions about this act

- Liability structure: **No-fault liability principle:** The operator is **strictly liable**, regardless of negligence.

- **Operator's liability cap:** Limited to ₹1,500 crore.
- **Government liability:** The Central Government bears liability beyond the operator's limit, up to the amount provided under the CSC.

- Right to Recourse: The operator is designated with the rights to recover from compensation

➔ A supplier, if right is provided by contract

➔ Any person who acted with intent to cause damage

This part of right to recourse is a very considerate inclusion as it allows India's operators like NPCIL to claim damages from the suppliers unlike the international model in which suppliers are indemnified.

- ***Limitation Course:*** It is very important to file for the claim of compensation within 10 years of the incident.

- ***Nuclear Damages claim compensation :*** This was added to speed up the process of adjudication and ensure specialized attention to matters regarding nuclear incident.

- ***Financial security:*** Operators must maintain **insurance or financial security** to cover their liability — typically through a pool mechanism backed by **General Insurance Corporation (GIC)**.

This Act was a landmark act in the history of nuclear energy in India as it attempts to reconcile two conflicting objectives - which is to promote international collaboration and ensure public safety as the utmost priority .

Post this , **A Nuclear Safety Regulatory Authority Bill** was proposed in 2011 to reform the nuclear regulatory framework in India.

The main was the replacement of ***AERB (Atomic Energy Regulatory board)*** which existed under ***Department of Atomic Energy (DAE)*** to- an autonomous regulatory authority ***Nuclear safety regulatory authority (NSRA).***

The objective is to ensure an independent oversight of nuclear safety without any potential conflict of interest .This independent body was made to ensure and promote accountability, transparency and public confidence in nuclear safety. The main aim was to establish a body which would be a statutory body, looking over all aspects of nuclear energy and radiation.
As an oversight body, everything which concerns from licensing to ensuring safety standards , conducting investigations and looking out for execution are evaluated under this.

Evaluating some nuclear incidents

- In Mayapuri, New Delhi a cobalt 60 source was sold as scrap dealer and later was dismantled. 8 people were injured, one died due to multiple organ failure. Now this incident highlighted the need to be very vigilant when it comes to handling and disposing of the radiological sources.

- The famous Bhopal Gas Tragedy, although not directly related to nuclear energy, had a major contribution in the CLND Act. The Bhopal gas tragedy gave a moral and legal precedence to the act. It provided a gateway to establish understanding that cooperation involved (in this case foreign cooperation) must take their share of liability.

The Legal and Administrative Framework of India's Nuclear Sector

This Indian framework is multi-layered to provide them with peace,safety, security while dealing with nuclear energy. The following are some statutory bodies that look over stable use of radioactive material.

Department of Atomic Energy (DAE)

This is the apex body, established in 1954, under the direct administration of the prime minister. It formulates and supervises programmes related to nuclear power generation. It also keeps an eye over bodies such as *BARC (Bhabha Atomic Research Centre), NPCIL(Nuclear Power Cooperation of India Limited),UCIL(Uranium Cooperation Of India).*

Atomic Energy Regulatory Board (AERB)

This came into existence in 1983, under section 27 of Atomic energy Act 1962, is the most significant authority ensuring nuclear and radiation safety. The functions are, although similar, granting authorisations, conducting inspections etc. Although a noteworthy thing is that it functions under the DAE.

Nuclear Power Cooperation of India Limited

A public enterprise under DAE which undertakes the idea of designing,construction and operation of nuclear power plants. It also ensures well-coordination between AERB and IAEA.

Bhabha Atomic Research Centre (BARC)

It functions as the research and development wing of the DAE, which also provides scientific and technical assistance to AERB in making safety standards.

Towards a Law–Management Synergy in Nuclear Governance

Centralised legal control is one significant aspect I noted. The Atomic Energy Act 1962, handovers most of the power to the centre, and restricts federal participation and public oversight. Another fact to notice is that the regulatory framework is fragmented deeply. DAE for formulation of policies or AERB for safety standards. The absence of an independent nuclear body highlights a major gap between legal intentions and judiciary execution.

We can also notice that the provisions like CNDL calls for accountability over liability on issues ensuring the right treatment and compensation of the victims of nuclear accidents. Section 17(b) — which allows recourse against suppliers — has faced criticism for discouraging foreign investment and complicating international partnerships.

Conclusion

India is a non signatory to Non- Proliferation Treaty but remains in strong cooperation with International Atomic Energy Agency Implementation gap still persists in terms of independent regulatory reviews. Weak inter-agency coordination, limited crisis preparedness, and inadequate risk communication show that legal mandates alone cannot ensure nuclear safety.

The nuclear legislation, therefore in India, requires more than legislation, it calls for sound implementation with a fusion of sound law and setting up transparent institutions.

Citations

- ***Atomic Energy Act, 1962*, No. 33, Acts of Parliament, 1962 (India).**
- ***Atomic Energy (Radiation Protection) Rules, 2004*, Gazette of India, pt. II, sec. 3(i), S.O. 1259(E) (May 18, 2004) (India).**
- ***Nuclear Safety Regulatory Authority Bill, 2011* (India) (not enacted).**
- **International Atomic Energy Agency (IAEA), *Agreement Between the Government of India and the IAEA for the Application of Safeguards to Civilian Nuclear Facilities*, INFCIRC/754 (Mar. 2, 2009).**
- ***Bhopal Gas Leak Disaster (Processing of Claims) Act, 1985*, No. 21, Acts of Parliament, 1985 (India).**
- ***Civil Liability for Nuclear Damage Act, 2010*, No. 38, Acts of Parliament, 2010 (India).**
- ***Atomic Energy (Radiation Protection) Rules, 2004*, Gazette of India, pt. II, sec. 3(i), S.O. 1259(E) (May 18, 2004) (India).**
- **Drishti IAS, *Radioactive Discharges from Indian Nuclear Plants*, Drishti – The Vision Foundation (Feb. 1 2024), https://www.drishtiias.com/daily-updates/daily-news-analysis/radioactive-discharges-from-indian-nuclear-plants.**