

The Civil Liability for Nuclear Damages Act 2010 – A Detour from the International Regime

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Abstract—India has embarked upon an ambitious nuclear energy expansion programme in accordance with which, it has passed The Civil Liability for Nuclear Damages Bill 2010. This act has been rife with speculation owing to the liability concerns of the operators and the suppliers, with the suppliers being hesitant to invest in nuclear energy due to fear of incurring liability. The paper revolves around the Indo –Russian nuclear agreement while discussing certain relevant provisions of the aforementioned act. It also provides a general overview of the current international liability regime and the present national legislation, analysing the economic efficiency of the latter. While discussing the merits and criticisms of the Agreement and the Act, we have provided a basic model for affixing liability in line with the absolute liability principle while also incorporating a game theoretical perspective and indifference curve approach by which we aim to develop a comprehensive nuclear liability regime based on sound law and economic principles. In our conclusion, we sum up the main points of our liability model while also pointing out which provisions of the Act and the said Agreement are economically efficient, and accordingly which provisions should be kept and what other provisions should be included if necessary.

Index Terms—Absolute liability, game theory and insurance model, Slutsky substitution effect, nuclear liability regime.

I. INTRODUCTION

Ever since the first commercial nuclear power reactors were built, there has been concern about the possible effects of a severe nuclear accident, coupled with the question of who would be liable for damages caused. The problem arose when more than one country or party started joining hands for the construction of the same. Hence, arose the need for an international nuclear liability regime to fix liability on the players involved in the operation of a nuclear power plant. The various international conventions, namely, the Paris Convention, 1960 complemented by the Brussels Convention, 1963 and the Vienna convention, 1963 impose liability on the operators in case of an accident. India is not a signatory to any of these conventions but in the face of growing energy demands, it embarked on an ambitious nuclear energy expansion programme. Realising the need of a national legislation to fix liability in the event of an accident, it enacted the Civil Liability for Nuclear Damages Act 2010. The major bone of contention in the current nuclear liability regime is the imposition of liability solely on the operator of a nuclear power plant while not affixing liability on the suppliers as well. Taking this into account, India has deviated

from the present liability regime by providing liability for both the suppliers and operators. The said Act differs from the international conventions by virtue of Section 17 and Section 46. This piece of legislation has elicited a multitude of responses from various sections of the Indian public as well as other countries.

The crux of the discussion in this paper is the Indo-Russian Nuclear Deal 2008 that departs from the regime laid down in the Act. Hence, we shall examine this deal in light of the Civil Liability for Nuclear Damages Act. We are basically focusing on the current Indian stand on the nuclear liability mechanisms. This paper is an economic analysis of the same where the authors aim to provide an efficiency analysis. The authors have come up with their own models in order to develop a comprehensive liability regime in the field of civilian nuclear energy production drawing from the economic analysis of the above mentioned nuclear deal. The paper provides purely an economic perspective and does not take political or other aspects into consideration although the authors believe it will broaden the horizon for policy makers.

A. A Brief Introduction of the Act

The Government of India's decision of indemnifying the Russian suppliers in the event of an accident has created much controversy with mounting concerns regarding the safety of the people. The fact that the said deal is in contravention of Section 17 of the Civil Liability for Nuclear Damages Act 2010 is also much debated. Moreover, the Act sets a financial cap on the operators that ranges at Rs 1500 crores which is considered to be much less than the cost of an accident if it actually occurred and henceforth the compensation provided to the victims will be inadequate. In this paper, we propose a comprehensive model to clearly define the liability regime which will encompass the various principles of law and economics to conclude whether this Act is economically efficient or not.

B. Assumptions

It is important to highlight the assumptions that have been taken in the subsequent analysis and recommendations:

- 1) This paper neither delves in the scientific or technical aspects of nuclear energy production or that of nuclear accidents nor discusses the technical nature of various safety measures to be taken to prevent accidents since that lies outside the purview of our analysis. However, the recommendations provided by us stress on these measures, incentivizing the parties to take the same.
- 2) The paper only takes into consideration the pre accident scenario defining liability rules and the importance of precautions to prevent any accident at all. Ex-post measures of victim compensation have not been

discussed.

- 3) Not counting the litigation aspect in the event a nuclear accident actually occurs, we have assumed litigation costs to be zero. We have assumed that the damage is measurable in economic terms and that a quantitative value can be put to it, not taking emotional stress, mental, psychological or any such aspects as determinants of computing damages.

Internalizing the costs of an accident is one of the most important tenets of liability law. In case of nuclear accidents, assessing these costs poses the biggest challenge. The costs being quantitative as assumed above, the paper seeks to achieve an interface between accident prevention and compensation where true internalization of costs of an accident will occur by setting clearly defined liability rules which will serve as incentives to take safety precautions, thereby protecting interests of the victims.

II. THE ABSOLUTE LIABILITY REGIME

This model analyzes the channeling of liability in case of a nuclear accident based on tort law principles which aims to minimize social costs and in turn increase social welfare. With respect to the application of the same analyzing takes place in either the *ex-ante* stage or the *ex-post* stage [1]. This model revolves around the *ex-ante* liability regime where it has been assumed that the damage is measurable and directly linked to the accident caused.

The tort law regime affords many solutions to set a well defined liability regime. For the purpose of our model, we will be dealing with the strict liability principle and we will go one step ahead by incorporating the absolute liability principle as outlined in the landmark judgment of the Supreme Court of India, namely, *M.C Mehta vs. Union of India* [2]. Through this, the total loss of the operator will be equal to his costs and he will take due level of care by minimizing his activity level or by strengthening safety standards unless his marginal utility exceeds costs of care plus expected compensation payments.

A. Application

The model discussed above shall now be applied to civil nuclear liability regime conforming to Indian standards. As mentioned above, the task is about minimizing the social costs. What is noteworthy here is that a nuclear accident is a unilateral event in which victims cannot assess risks and hence have no role to play making the operators the least cost avoiders and hence affixing liability on them. Also, the absolute liability model incorporates least information costs as the courts do not have to determine due standard of care as is done in a negligence model.

We shall now include the polluter pays principle, no harm principle and precautionary principle in the absolute liability model. The polluter pays principle basically exists to make industries absorb the negative externalities they create. It implies that the injuring party shall bear all costs which provide strong incentives to the polluter to ensure that safety regulations are properly enforced. The no harm rule is embedded in the maxim '*Sic uteretur alienum non laedas*' which roughly translates into, 'one shall use one's property

so as to avoid injuring others.' The Precautionary Principle holds that where there are threats of serious or irreversible damage to the people or to the environment, lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation. The burden of proof shall lie on the party causing pollution and not on the exposed. Nuclear accidents are high severity and low frequency phenomena. The potential victims cannot accurately take accident costs into consideration, thus it becomes the duty of the hazard creator to fully assess risks, provide accurate information about the relevant risks to the potential victims and prove the extent of risk or the degree of safety. Imposing absolute liability on the operator in case of a nuclear accident would thus be efficient in the lights of the above mentioned principles.

B. Result

In the above model we have proved how an absolute liability regime, on the operator, in case of a nuclear accident is favoured. Now with respect to the deal signed between the two countries, it does have provisions of making the operator liable while also imposing a financial cap on this liability. For developing a comprehensive regime, we advocate operator's absolute liability for incentivising them to take maximum precautions. Also, imposition of a financial cap on operator's liability is necessary in order to boost investment in the nuclear industry. In case, there is a patent or latent defect in the plant, the supplier will be able to roll over the damages to the operator putting him in an adverse situation which is not desirable. Opposed to this deal which indemnifies the suppliers, The Civil Nuclear Liability for Damages Act should be credited for having taken the bold step of providing right of recourse to operators against suppliers in certain circumstances, by making suppliers liable. This is economically efficient as rolling over of responsibility by suppliers will reduce and also, the suppliers in a bid of reducing costs will not compromise on quality or safety standards. Further, we propose to cap the supplier's liability which will not only provide a sense of security to the suppliers but also will not hamper the foreign investment in the nuclear industry.

III. GAME THEORY

As seen above, the absolute liability model is the first best solution to fix liability. If the operator knows that he will eventually be liable for compensation, he will either reduce the level of risky activity or he will continue at the same level but will take proper or due care to ensure safety. However, this is not as easy as it may sound. The imposition of a financial cap on operator's liability and the possibility of shifting the burden of the liability on the insurers may deter the operators from taking due care. In the Indian context, there are concerns about how this limit on liability is really low and how eventually if an accident does happen, the victims will be majorly undercompensated. The low limit on liability does not fully reflect the costs of nuclear power. It leads to imperfect risk perception among the consumers of nuclear energy and hence they will consume more than what is socially desirable. Thus, a low limit on operator liability

actually is a form of subsidy[1] provided to the nuclear industry and fails to internalise the costs of nuclear power. Thus if we consider this argument from an *incentive analysis perspective*, then initially the liability limit can be low in order to encourage indigenous investment. However, subsequent amendments are to be made to increase this liability ceiling. The major argument against this proposition is the judgement proof problem as given by Shavell [1]. When faced with high liability, operators can declare themselves as insolvent and hence become untouchable by the legal process. Unlimited liability of the operators is also not favourable for insurance coverage as it would not be feasible for an unlimited liability amount. Also, this will be passed down to the consumers of nuclear power as higher energy costs which will render nuclear energy unproductive. Hence, in our model imposition of a ceiling on operator's liability subject to subsequent raises is economically efficient.

Reverting back to the Indo-Russian nuclear deal, the major justification for indemnifying suppliers and exempting them from liability was 'foreign investment'. Most suppliers have expressed concern about Section 17 of the Civil Liability for Nuclear Damages Act. Countries like U.S, France and Canada have expressed reservations about cooperating with India on the basis of this particular clause as they think Section 17 and 46 of the Act make supplier's liability unlimited. Domestic suppliers are also reluctant to cooperate. The Indian Government is thus at crossroads. On one hand, it has to boost the global nuclear industry to cooperate with India in its nuclear expansion policy and on the other hand, it has to take into consideration the safety of the people. The government is under pressure to amend Section 17 of the Act for the sake of meeting pressure from the suppliers. Let us give a *game theoretical perspective* to this entire cooperation conflict. For the sake of this discussion, we limit the game to two players, namely India and Russia.

Game theory is the formal study of decision-making where several players must make choices that potentially affect the interests of the other players [3]. The players will make decisions based on their respective payoffs. Payoffs are basically the utility or the profit or any other cardinal or ordinal number that the players want to achieve. In a strategic game situation, the players aim to maximize their respective payoffs.

Now for this analysis, let us assume two players India and Russia. India is Player 1 and Russia is Player 2. Both India and Russia have a couple of strategies available for each. India has two strategies namely A and B. Russia has two strategies namely P and Q. Now let us define what these respective strategies are.

Strategy A for India is foreign investment. India needs participation from abroad for expansion of its nuclear energy programme. In order to meet the growing energy demands of the people, foreign investment in nuclear power is important as India is still not in a stage to indigenously run its entire nuclear programme. Hence foreign assistance is absolutely necessary. Thus, the deal stands as it is.

Strategy B for India is safety of the people. It will be considered a bad investment if India gives more priority to foreign investment and less to the safety of the people. If

India indemnifies suppliers and excludes them from all liability, then the safety of the public is in serious danger as the suppliers have no incentives to take safety precautions. So even if a supplier knows that the product he is supplying is defective, he will prefer to keep the information to himself, leading to *asymmetrical information* between both the parties. This is the case where the seller of a product knows that the product is defective but does not divulge the information to the buyer. In this scenario, there arises *adverse selection* where the buyer or the operator in this case will end up receiving sub standard equipments or reactors thereby reducing profitability and increasing the probability of an accident. This also leads to *imperfect risk perfection* as the operator will think that due standards of care have been met by the supplier when in reality they have been not. The operator then might not pay attention to the activity level and may also not be more stringent about safety measures which will ultimately increase the social costs of the accident. Thus supplier liability is necessary and hence the Government will not exclude suppliers from liability in the deal.

Now Player 2 which is Russia has two available strategies- P and Q.

Strategy P for Russia is that it can agree to continue cooperation under the ambit of the Act and agree to share liability. Strategy Q for Russia is to disagree to continue cooperation, which is maintain its stance to not accept any liability and refuse to help India any further.

It is important to note that each strategy is exclusive and does not overlap. That is to say that if India chooses A, it cannot choose B and vice versa.

Given below is a strategy table of both the players.

TABLE I: STRATEGIES

INDIA	RUSSIA
Strategy A- Foreign Investment	Strategy P- Agree to Cooperate
Strategy B- Safety	Strategy Q- Disagree to Cooperate

Now that we have got the strategies of both the players in place as depicted in Table I, it is important to consider the payoffs that each player will get by choosing any particular strategy. For this purpose, we make a payoff matrix. Now it is important to note that that these payoffs will be represented as preferences from a scale of -1 to 1 [4]. Given below is the preference scale table.

TABLE II: PREFERENCE SCALE TABLE

NUMBER	PREFERENCE
-1	Most Unfavourable
-0.5	Unfavourable
0	Neutral
0.5	Favourable
1	Most favourable

Now let us analyze the strategies of the two players. If India chooses strategy A, then the increased energy demand will be met in the economy as a result of expansion of the nuclear programme but there will be no incentive for the

supplier to take safety precautions and the entire cost will fall on the operator. Moreover insecurity over safety concerns will lead to a major loss in public confidence. If India chooses B, then it will dampen foreign investment and the liability on the supplier will be passed on as higher energy costs to the public. Thus, the final consumer will be affected in price terms but there will be a guarantee of safety which will avoid a loss that will be way more in economic terms than the increase in price of energy. Besides, alternative energy sources are also available.

Considering Russia's position, if it chooses Strategy P, then it will get valuable foreign exchange but will be exposed to liability in case of an accident. It can pass the liability as higher energy costs but the compensation to be paid in event of an accident is a major downer for investment. If it chooses Strategy Q, then it will lose out on valuable foreign exchange. However, choosing strategy Q will depend on what strategy is being adopted by India. According to the *rational choice theory* which states that a rational individual will analyze the costs and benefits of his choices so as to maximize his utility. Drawing from the discussion above, it would be a rational choice for India to adopt strategy B than A. Before constructing this payoff matrix, let us enumerate a few assumptions. Firstly, we have assumed this to be a game of symmetrical information where each player knows what the payoffs for the other player are going to be and what strategy will be adopted by each. Also let us assume that for India, safety gives more utility than foreign investment. Based on this, we have the payoff grid below in accordance with the payoffs given in Table II:

		RUSSIA	
		Strategy P	Strategy Q
I N D I A	Strategy A -foreign investment	1 0.5	-1 -0.5
	Strategy B -safety	-1 1	0 0

Fig. 1. Payoff matrix.

If India chooses strategy A and Russia chooses P, then their respective payoffs are 0.5 and 1 as shown in Fig. 1. India gets foreign assistance and an impetus to expand its nuclear programme hence it is a favorable outcome. For Russia, it is an all benefit investment. It gets valuable foreign exchange on one hand and just like the present deal states; there is no responsibility of Russia to compensate victims in case of an accident. Hence it is a most favourable investment for Russia.

If India chooses strategy A and Russia chooses strategy Q, then it will be an unfavourable outcome for India for it is letting go of its safety concerns and is choosing foreign investment thereby indemnifying suppliers just like in the

present deal and still if the supplier does not invest, then India is left with an unfavourable result. If Russia disagrees to cooperate, then it will be a most unfavourable outcome for Russia as it has no apparent reason so as to not cooperate. Not only is it getting valuable foreign exchange but is also being exonerated from all liability. If it does not cooperate even in this situation, then it will be left worse off than before.

If India chooses strategy B and Russia chooses P, then it is an all out benefit for India. Not only is it getting foreign assistance in its nuclear expansion programme but is also getting the benefit of shared liability with the suppliers. Hence, the requisite safety parameters are being met. This makes it the most favourable outcome for India. For Russia however, it is a most unfavourable outcome as it will have to accept the clause of supplier liability and although it will get foreign exchange, the liability arising in case of an accident will be one cost that they will want to avoid.

If India chooses B and Russia chooses Q, then both are left unaffected or at a neutral outcome as India is not getting foreign investment but at the same time the safety of the people is not being jeopardized. Russia on the other hand is not getting foreign exchange but is also exempted from liability. Hence, India and Russia both face a 0,0 payoff.

We have already elucidated the assumption that safety gives more utility to India than foreign investment. Hence India will choose strategy B. We have also simultaneously assumed that each player knows what the other player's strategy is and each player is also aware of its own payoff as well as the payoff of the other player. Going by this, Russia has two alternatives. Either it should choose Strategy P or Q. Drawing from the payoff matrix, in light of India choosing B, Russia gets a payoff of -1 and 0 if it agrees and disagrees to cooperate respectively.

Hence, since $0 > -1$, Russia will choose Strategy Q, i.e., it will disagree to cooperate.

This is not a *pareto efficient* outcome as higher payoffs are possible for both the players if they find a Zone of Possible Agreement (ZOPA) wherein the concerns of foreign investment and safety are not mutually exclusive but they overlap each other. In view of this fact, we will now be giving our recommendations.

IV. INSURANCE AND NEGOTIATION THEORY

In the 1950s, the system of insurance pooling was introduced where major insurance companies in every nuclear energy producing country decided to come together on a non competitive basis in order to cover for the huge risk amount involved. There are around 26 pools that exist worldwide right now [5]. These pools provide for first party as well as third party insurance. First party insurance includes insurance for the nuclear reactor itself whereas third party insurance is insurance for victims of an accident who are directly or indirectly affected by it.

Insurance can act as a *liability vault* for victims and operators alike. Before discussing the insurance regime let us first look into the Indo- Russian deal from the standpoint of *negotiation theory*.

The negotiation theory as the name suggests primarily talks about the process of negotiating that is fundamental to

every strategic partnership. Earlier structural approaches to the negotiation theory viewed negotiations as zero sum games [6] where one party gains and one party stands to lose. However recent approaches aim to use negotiations to arrive at a common solution rather than make it a competitive game. We have already applied the strategic approach of negotiation theory in the form of the game theoretical perspective provided earlier in the paper. Using the integrative approach, we aim to arrive at a win-win situation in order to develop a liability regime that looks at 'expanding the pie' [6] rather than 'keeping the pie'. This solution is offered through insurance where not only operators but also suppliers will be able to roll down their liability through an appropriate insurance mechanism.

In India, the major problem with a suitable insurance mechanism is the lack of foreign underwriters as the Indian Government does not allow them to inspect nuclear power plants due to which they do not agree for coverage. In our recommended insurance regime, we have taken administrative costs into account and hence the activity level of the insured has been considered. The national insurance scheme is not very promising considering how only one company, namely, General Insurers Ltd. provides insurance for nuclear accidents. Also this coverage is only for the cold zone (everything other than the nuclear reactors themselves) and does not extend up to the hot zone, which consists of the nuclear reactors. This will be possible only when an insurance pool is formed. In order to spread the risk, reinsurance and coinsurance mechanisms need to be developed. Self insurance is one such method wherein in order to avoid high administrative costs, the operators set aside a certified amount to meet future contingencies which can then be used by the Government in case of an accident. However, this may lead to under compensation of victims; hence a national pool with reinsurance mechanisms from overseas is the first best solution. The supplier liability shall also be channelled through insurance where the cost of insurance will vary according to the price of the contract so that suppliers of small parts and equipments do not have to buy costly insurance.

All insurers' face the risk of moral hazard [1] wherein the injuring party has less incentives to take due care once insurance is obtained. The injuring party may increase its activity level which will not reflect in the premium charged and hence will lead to imperfect risk perception. To cope with this problem, the operators of the plants should also contribute to the insurance coverage so that the injuring party has an incentive to meet the due level of care or reduce their level of risk causing activity.

In the field of nuclear liability, the amount of insurance coverage is determined by the risk neutrality of the insurer which is directly affected by the profit margins of the monopolistic insurer. Rather than making it a unilateral monopoly, a bilateral monopoly can be formed wherein a joint profit maximizing strategy should be followed [5]. This will mean that the injuring party will seek to lower the premium whereas the insurers will seek to reduce the amount of coverage leading to the liability being limited in amount and in time. As a comprehensive recommendation, we support the cap on operator's liability rather than advancing

towards an unlimited liability regime for reasons that we have enumerated in the paper earlier. However, the operator's liability is not to be limited in time for that will severely reduce the operator's incentives to take due care and is fundamentally against the precautionary principle. However, we do support a limitation of amount and time in suppliers' liability. This is to serve the dual purpose of incentivizing the supplier to take precautions in supplying quality equipments and materials which is appropriate according to the incentive analysis theory and the Government's concern for foreign investment.

V. INDIFFERENCE CURVE ANALYSIS

In the preceding section of the paper, we have analyzed the Indo-Russian Nuclear Agreement and certain provisions of the Civil Liability for Nuclear Damages Act. In order to fortify the above made suggestions, we present our argument by means of a graph. In this particular graph, we use the *Slutsky substitution effect* to highlight certain key points of our analysis. The indifference curve shows all possible combinations of two goods that give the same amount of satisfaction to an individual as long as these combinations lie on the same indifference curve. In Slutsky's substitution effect of indifference curve analysis of demand, the change in price of one good affects the real income or purchasing power of the consumer and this change in real income has to be compensated by an equivalent change in money income. Also, the income is changed by the amount which leaves the consumer in a position to buy the same combination of goods as before if he so desires. That is to say that the income is changed by the difference between the cost of the good X (in case of two goods X and Y) purchased at the old price and the cost of purchasing the same quantity of X at the new price. In other words, the income is changed by the *cost difference* [7]. We will now be using this approach to justify our recommendations given in the liability model where we advocate for suppliers liability and also in favour of imposing a financial cap on the operator's liability. This graph is illustrating the trade off between two goods, namely, safety and investment as depicted from the operator's point of view.

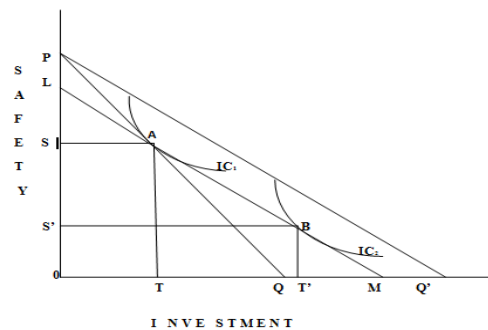


Fig. 2. Graph

As is seen in the above graph, investment and safety are taken on the X and Y axes respectively. With the cost of these two goods remaining constant and with given money income of the operator as shown by the budget line PQ, the operator is in equilibrium at point A on the indifference curve IC1 to which PQ is a tangent. At point A, the operator is investing

OT amount in nuclear energy expansion and is allocating OS amount for safety. Now the current national legislation, which limits operator liability by imposing a financial cap on the extent of liability, is an indirect subsidy to [8] the nuclear industry. Thus by the imposition of this financial cap, the real income of the operator increases which shifts the budget line from PQ to PQ'. Now applying the Slutsky substitution effect, the money income of the operator has to be reduced so as to compensate for the rise in real income. This can be done through direct tax on money income. A noteworthy point is that in this case, it has been assumed that investment is not affected by the existing tax structure. It is just affected by the liability regime and changes made in it.

Now following the Slutsky approach, a budget line LM is drawn parallel to PQ' which passes through the original point of equilibrium A. This implies that only that much money income of the operator has been reduced so as to enable him to have the same combination of the two goods if he so desires. However, the operator will not stay at point A but move to point B which lies at a higher indifference curve IC2 to which budget line LM is a tangent. This is because of the indirect subsidisation of the nuclear industry by the Government which limits operators liability thereby encouraging the operator to invest more. Thus, in the Slutsky substitution effect, the consumer does not move along the same indifference curve but moves to a higher indifference curve just as depicted in the graph above. Now at point B, the operator is investing OT' amount in the nuclear energy programme since investment has become more lucrative but at the same time, the allocation towards safety has reduced to OS'. This is because the operator does not have enough incentives to spend on safety measures in face of limited liability in case of nuclear accidents. Thus, the Slutsky substitution effect on investment is the increase in investment by TT' and the effect on safety is the reduced allocation towards safety by SS'.

Thus it is evident that safety is being compromised by imposing a financial cap on the operator's liability, we do support the imposition of a financial cap on the operator's liability subject to increase in the liability limit. Also, as indicated earlier, we are in favour of suppliers' liability that should be limited in amount and in time so as to not curb suppliers' investment. Moreover, this liability of the operators and the suppliers will be channelled through an insurance pooling system as discussed above.

VI. CONCLUSION

The Civil Nuclear Liability Act 2010 has been a source of massive conjecture on account of providing right of recourse to operators against suppliers and limiting operators liability. The debate has been heavily fuelled with arguments on both sides. While some say that the right to recourse provided to the operators will basically enable operators to roll down their responsibility to the suppliers and this will adversely affect foreign investment and will also ultimately result in higher energy costs passed down to the consumers by the suppliers of nuclear energy, others are in favour of this Act and believe that this detour from the international liability regime is actually a progressive step wherein suppliers of

nuclear materials and equipments are not let go scot-free. In the face of this debate, came another issue regarding the Indo-Russian Nuclear Agreement wherein India agreed to indemnify Russian suppliers and absolve them from all liability. This agreement was heavily criticised for being utterly insensitive to the safety of the people and was challenged as unconstitutional. The Government argued that they had not entered into any constructive agreement with any country post the Bill was passed in the Parliament. It was a sure-fire method of attracting foreign investment in the field of nuclear energy for the Government.

In the backdrop of all these arguments, our paper focuses on the merits and demerits of the Act and the Agreement wherein we give our recommendations to form a comprehensive liability regime that is based on sound law and economics principles. We have already shown in the paper how strict liability is the first best solution in the field of fixing liability in case of nuclear accidents. We even went one step further by incorporating absolute liability which does away with the exceptions outlined in strict liability and this gives an absolute incentive to the operators to monitor their activity level and take necessary standards of care.

By making suppliers liable, the liability regime aims at incentivising them to meet due standards of care as well. However, as we proved in the game theory, Russia will choose not to cooperate in the event India chooses to make suppliers liable and encompass the provisions of Section 17 of the Act in the Agreement. We also used the negotiation theory to come to the same conclusion. However, not making suppliers liable is not economically efficient as the entire responsibility will then fall on the operators who will have to invest in costly insurance and they will refrain from investing in the nuclear expansion programme. Hence there has to be a middle solution that appeases to both operators and suppliers. Thus we impose liability on both operators and suppliers which will be further channelized through insurance pools. There shall be a cap on the operator's liability as unlimited liability is economically impractical and will majorly deter investment. The suppliers liability on the other hand will be capped too. The liability shall be limited in time where a reasonable period is allowed for the operator to sue the supplier. This period should be devised so as to be sufficient for enabling the operators to discover latent or patent defects in the nuclear plant or equipment. This has been provided for in the Civil Liability for Nuclear Damages Rules 2011 in the form of the product liability period to be decided by the supplier. This period has to be long enough for incentivising suppliers enough to meet due standards of care. Also the amount of liability for suppliers will depend on their level of investment in the nuclear expansion programme for a supplier supplying equipments worth a crore cannot be expected to bear the same liability in the same proportion as a supplier supplying materials worth 100 crores. This will not only give suppliers a boost for investment but will also ensure that ex ante measures to prevent accidents are taken in their full regime.

The Act although heavily criticised is economically efficient from our point of view for it brings out a new system of fixing liability that countries like Japan are now supporting, especially since major disasters like Fukushima. If the

supplier's liability recommendation is taken in its ambit, the Act will be a trendsetter in its own right.

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