

Article

Regulatory regime in fixing risk accountability of inland oil and gas exploration and production industry in India

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Abstract

The oil and gas industry in India causes number of environmental and social disasters in the process of inland oil and gas exploration and production. Incidents such as oil spills, blowouts, explosions, and fires, cause loss of human lives and damage to the flora and fauna. There were several instances of oil spills and blow outs in India causing irreversible damage to the environment and communities who resides in close proximity. The root causes behind most of the incidents have been and still are due to non-compliance of technical standards and/or negligence on the part of the management in the process of planning, coordinating and supervision. However, when it comes to the regulatory regime in fixing accountability for such disasters, most of the regulations and legislations in the country overlook the incidents or damages caused by inland oil spills, blowouts and explosions. A strong regulatory regime pertaining to inland oil spills and blowouts in India not only to affix accountability but also to ensure safety and compliance of the environmental and societal norms is therefore, the need of the hour. The aim of this paper is to address this legal-enviro gap pertaining to inland oil and gas exploration and production in India. It discusses the key aspects that need to be focused on to form a strong regulatory regime in India pertaining to inland oil and gas exploration and production.

Keywords inland oil and gas; accountability; regulatory regime; risks; environmental hazards; India.

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1 Introduction

The oil and gas industry operates at three major streams i.e. upstream that takes care of exploration and production, midstream i.e. transportation and storage before processing and downstream i.e. refining and converting crude into finished products (Burclaff, 2021). The nature of industry is such that processes at all streams deal with highly inflammable hydrocarbons and operates under high temperature and pressure, making it inherently very risky. Exploration and production are complex and costly operations that require the coordinated performance of the drilling rig owners and operators with many other contractors (Baram et al.,

2014). Many aspects of their operations are intrinsically hazardous and thereby pose risks to health, safety, and the environment, as well as to other societal and commercial interests. The major concern is with the incidents caused by sporadic occurrence of oil spills, blowouts, explosions, fires at the drilling rigs and gas flaring that costs multiple injuries and death among the workforce and destruction of company assets. Oil spills that contaminated vast onshore areas resulting loss of wildlife, pollutes air and water bodies and other societal imbalance, has become a mainstream issue of concern considering the damages done so far by such incidents to the environment and society at large.

The industry undertakes the activities that include exploration for crude petroleum and natural gas, drilling, equipping wells, operating separators, emulsion breakers, and field gathering lines for crude petroleum and natural gas, and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. The oil drilling station and refineries cause potential environmental hazards and increased concern for communities in close proximity to them. The most widespread and dangerous consequence of oil and gas industry activities is pollution throughout all the stages from exploration to refining. Most recently such a disaster happened in Oil Well Baghjan-5 started by Oil India Limited (OIL) in the state of Assam, India caused by massive gas and oil leak blowout on 27 May 2020 and leads to explosion on 9 June 2020 that costs loss of human lives, damages to wildlife and aquatic species even causing health hazard to the surrounding habitant (Kalita, 2020). This was not the first of its kind in India as in the past; there were several instances of blowouts and oil spills causing irreversible damage to the environment and society at large (Brahma, 2022).

India framed numbers of regulations and guidelines to regulate the oil and gas industry in the country, the regulatory regime against the damages from such oil incidence in India are yet need to be developed. While reviewing the regulatory regime against such disasters, it is quite evident that most of the regulations and legislations in the country focuses on the incidents occur in the marine environment and miss out incidents or damages of inland oil spills, blowouts and explosions (Chakravarty et al., 2020). Therefore, a strong regulatory regime pertaining to inland oil spills and blowouts in India, therefore, is the need of the hour. A regime rooted deep into enviro-legal issues in this regard will not only provide a rule to affix liabilities but also will ensure safety and compliance of the environmental and societal norms. It is necessary to find ways to conciliate the extracting industry's development with environmental and societal protection, that is, with sustainable development.

As far as the organisation of the paper is concerned, the paper has been organised into sections. Section one discusses the risks associated with inland oil and gas exploration and production in India. Section two deals with how the risks associated with the inland oil and gas explorations and productions can be minimised? Section three gives an overview of the regulatory framework in India in place to counter the risk associated with the inland oil and gas exploration and production. Section four deals with the question - 'What are the aspects that need to be focused on to form a strong regulatory regime in India pertaining to inland oil and gas exploration and production?' Finally, section five has been devoted to conclusion of the paper.

2 Risks Associated with Inland Oil and Gas Exploration and Production

For the purpose of the study, the "Risks" has been defined as the product of the occurrence of adverse event and the weight of consequences of such events (Sotic et al., 2015). The risks associated with the inland oil and gas exploration and productions in India have been studied keeping in mind the incidents and disasters happened in India and the consequences of such incidents on the environment and society at large. Needless to mention that a review of the root causes behind such incidents happened in India from time to time will not only help in identifying the technical gap but also will help to put in place an appropriate preventive measures

required to reduce the probability of such incidents in the future. Some incidents that were taken into consideration to serve the purpose of the study along with their root causes have been delineated as follows:

2.1 Incidents related to explosions of natural oil and gas

In 2009, an incident occurred during the transferring of Kerosene and Motor spirit from the Indian Oil Corporation's Petroleum Oil Lubricants (POL) Terminal at Sanganer, Jaipur to the neighboring Bharat Petroleum Corporation Limited (BPCL) Terminal (Oil Industry Safety Directorate, 2008). Subsequently, a huge leak of the product took place as a jet of liquid from the pipeline. Without the availability of any operating crew for initiating any control actions, the leak continued unabated and after some time, a huge fire with massive explosion occur covering the entire installation. The fire which followed the explosion soon spread to all other tanks and continued for about 11 days. Eleven people lost their lives in the accident and 45 others were injured (Sharma and Mishra, 2013). After such major incident, the Government of India has constituted the MB Lal Committee (Oil Industry Safety Directorate, 2010) to probe the matter. The immediate cause of the accident was the non-observance of normal safety procedure involving sequence of valve operation in the lineup activity and an engineering design which permitted use of a "Hammer Blind Valve", a device which is used for positively isolating a pipeline. The basic or root causes were absence of site specific written operating procedures, absence of leak stopping devices from a remote location to stop the motor operated valve and insufficient understanding of hazards, risks and consequences (Lamba, 2022).

Explosion followed by a massive fire took place and flame engulfed a large area around the Natural Gas Pipeline Network of Gas Authority of India Limited (GAIL) in the year 2014 at Nagaram in East Godavari district of Andhra Pradesh, India (The Petroleum and Natural Gas Regulatory Board, 2015). As a result of fire the nearby dwelling units, houses, people burnt alive, some people seriously got injured, birds, domestic animals, coconut trees were got affected and burnt (Lakshmi and Kumar, 2015). An enquiry committee comprises of the representatives from various authorizes to see the reasons behind the explosion and fire incident in GAIL pipeline, to fix the responsibilities and finally to make recommendation for the future so that such incidents can be avoided. Default in compliance of the various provisions with respect to design, maintenance, operation, inspection, integrity management and quality of gas etc under the provision of the Petroleum and Natural Gas technical standards and guidelines as need to be followed by every hydrocarbon industry.

2.2 Oil well spills, and fire blowouts

An inland oil well blowout occurs on 27 May 2020 at Oil well Baghjan-5 located in Upper Assam in Tinsukia District, Assam, India and had a subsequent fire explosion on 9 June 2020, that claimed death of two lives and several injuries besides displacing thousands of families from the nearby villages within the range of 2km from the Oil well (The Hon' ble National Green Tribunal Principal Bench, 2020). The fire continued to rage for five and a half months from the date of its eruption and was brought under control on 15 November 2020. Many departmental studies had found that the Oil well Baghjan-5 oilfield has caused adverse impact on biodiversity of the region as the well is located in close vicinity of Dibru Saikhowa National Park and Maguri Motapung Beel (wetland) leaving natural gas and condensate oil gushing out in the open. Although the verdict on its cause is yet to come out, industry insiders believe that the incident was a result of sheer negligence. Hence, such incident put questions on the concerned authorities of the Oil India Limited (OIL) relating to the control and mitigation of such impact from the fire blowout of oil well-5. Consequently a petition has been filed under Bonani Kakkar -Vs- Oil India Limited & Ors, 2020 and Wildlife and Environment Conservation Organisations -Vs- Union of India & Ors, 2020 before the Honourable National Green Tribunal immediately after the incident.

The Honourable National Green Tribunal vide its Order dated 24 June 2020 constituted an Expert Committee under the Chairmanship of Justice Brojendra Prasad Katakey (The Hon'ble National Green Tribunal Principal Bench, 2020) to examine the causes of leak from the oil well no-5 and the extent of losses/damages caused to the human and wildlife in the nearby region. The committee also examined contamination caused to water, air and soil of the area of the oil well no-5 and its surroundings and measures the contamination of water of the Dibru River also on agriculture, fishery and loss of raring animals in that area (The Wildlife Institute of India, 2020) the oil well which is situated within the range of 500m. Considering the damages caused to the environment and society, the committee has raised certain questions to the OIL authority on the count of mitigation measures carried out to neutralise or countervail the damages, root cause of the failure to control and prevent the incident and the total assessment of compensation for the victims, cost of restitution of the damage caused to property and the environment. The Committee has also placed some preventive and remedial measures (Goswami et al., 2021) and cites lapses in technical operations that cause of the blowout and explosion. Further, based on evidence, it has stated that the concerned authorities of OIL did not have the mandatory Consent to Establish and Consent to Operate their functioning both under Section 25 & 26 of the Water (Prevention & Control of Pollution) Act, 1974, under Section 21 of the Air (Prevention & Control of Pollution) Act and the Rules framed there under and/or the authorization under Rule 6 of the Hazardous Waste (Management, Handling and Tran-boundary Movement) Rules, 2016, either when the OIL first started its drilling operations in Well Baghjan No.5 in 2006, or on the day of the blowout of Oil well Baghjan no- 5 i.e. 27 May 2020 and subsequent explosion on 09 June 2020 (Oil country Tubular Ltd v A.P. Pollution Control Board, 2005).

However, it has been seen that the above mentioned oil well-5 by Oil India Limited did not acquired the Consent to Establish and/or Consent to Operate to either carry out drilling and testing of hydrocarbons in many locations in Tinsukia district (i.e., approximately 36 new drilling operations has started) under the Dibru Saikhuwa National Park Area under Section 25 & 26 of the Water (Prevention & Control of Pollution) Act, 1974, under Section 21 of the Air (Prevention & Control of Pollution) Act and the Rules framed there under and/or the authorization required under Rule 6 of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016. From such incidents, as per the report of various ecological study done by some government departments, university and college department, an overall estimated ecological damages amounted to Rs. 25000 crores (Rs. 250 billion), has been predicted and the report of the inquiry commission set up by the Assam government on the Baghjan blowout depicts "estimated carbon earnings were valued at Rs. 18234 crores (during restoration) and this resulted in net liability of Rs. 6800 crores over a period of 10 years." These are some of the estimated damages calculated by various departments and commission but the damages are much more than that and have a continuous effect on the environment and the human society.

3 Minimization of Risks

As far as the risks associated with the inland oil and gas explorations and productions are concerned holistic approach to cope up with the risks in all the stages of exploration and productions is required (Rawat at el., 2022). The efforts of the management on the count of process design, control and monitoring, prevention, mitigation, plant and community emergency response can play a significant role in this regard. This has been reflected in Fig. 1 below. On the Y axis the Fig.1 shows the efforts of the management on the counts mentioned above and on the X axis the risks associated with the inland oil and gas exploration and productions. It shows that there is an inverse relationship between the efforts to cope with the risks by the management and the risks associated with the process.

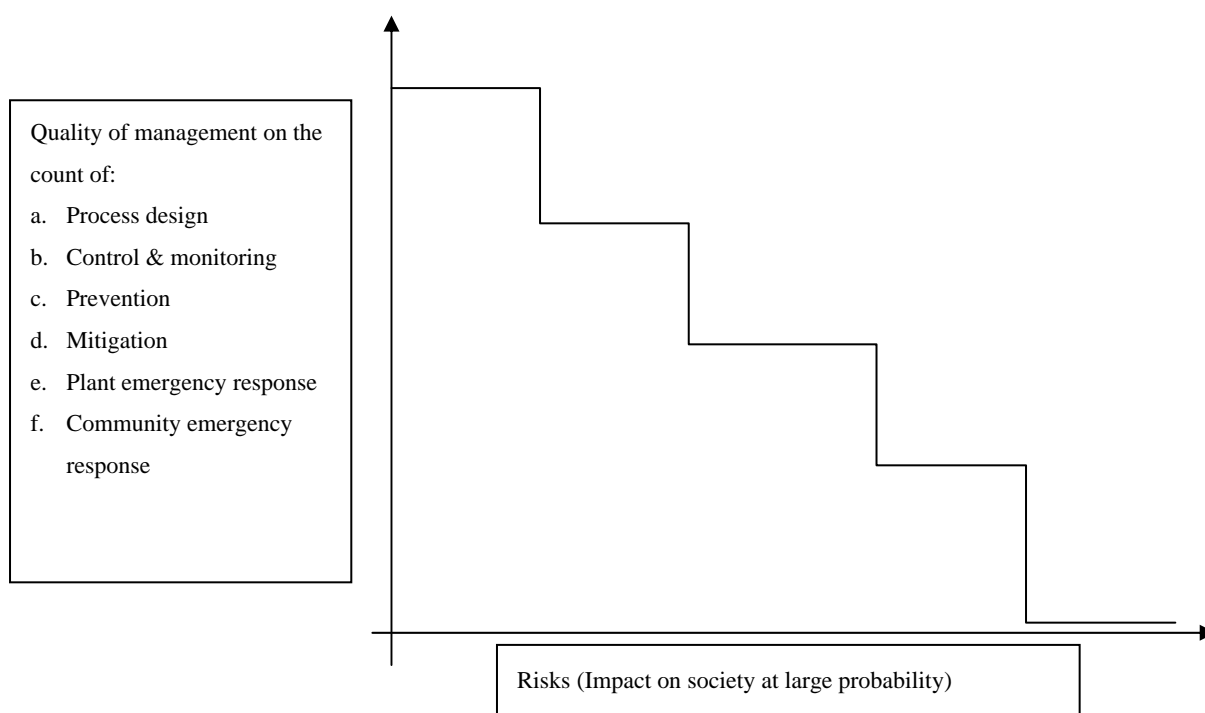


Fig. 1 Relation between effective management and risks associated with inland oil and gas exploration and productions.

The process design implies the idea of inherently safer design either by minimisation, substitution or modernisation. Controlling and monitoring deals with process fluctuations, before they turn into a hazard by continually measuring key parameters, e.g. temperature, pressure, fluid levels etc. Control systems bring back the system into normal conditions and are a proactive way to reduce the risk in the operational phase of the installations' life. The preventive measures delineates the additional process alarms reacting to sensor errors, malfunctions etc. that require operator corrective actions. The mitigation focuses on actions that minimize the consequences. The plant and community response streamlines the response at the installation and assess, whether the emergency must be passed on to external sources. The higher the efficiency on all the counts mentioned above the lower will be the risks associated with the inland oil and gas exploration and productions.

4 Regulatory Framework in India To Counter The Associated Risks

The Constitution of India provides the central legislative body in India to regulate and develop oilfields, mineral oil resources, petroleum and petroleum products. The Ministry of Petroleum and Natural Gas regularly ensures the various safety concerns in the Oil and gas Sector and directs the oil companies to adopt suitable measures for the safety of the vital installations. Since the ultimate concern of this industry is on the safety, health and environmental aspects; ensuring that concerted efforts are being made by the Industry in this regard is crucial. A technical body under the Ministry undertakes necessary Safety Standards depending upon the emerging needs of the safety of oil installations and these standards are adopted after a due process and included in various rules/regulations. Additionally, The Petroleum Board makes standards pertaining to pipeline design, materials and equipment, piping system components and fabrication, installation, testing, corrosion control, operation and maintenance and safety of petroleum and petroleum products pipelines.

Moreover, The Environment Protection Act, 1986, gives powers to the concerned Authority to undertake measures for improving the environment and set standards and inspect industrial units. Through notification dated 16 January 2020 that onshore and offshore oil and gas exploration activities should be categorized into B2 category for seeking prior Environmental Clearance (EC) (The Ministry of Environment, Forest and Climate Change, 2020). In the original Environmental Impact Assessment Notification, 2006, “offshore and onshore oil and gas exploration, development and production” has been covered under schedule 1(b) and being category ‘A’ projects require preparation of an Environment Impact Assessment (EIA) report, conduct of public hearing and clearance from the Union. As exploration activities in hydrocarbon sector have been moved from Category A to Category B2, will now require environmental clearance only from the States concerned and will not require preparation of an EIA report or conduct of Public Hearing. This change in category will highly impact as there is no concern for the public near the exploration activities.

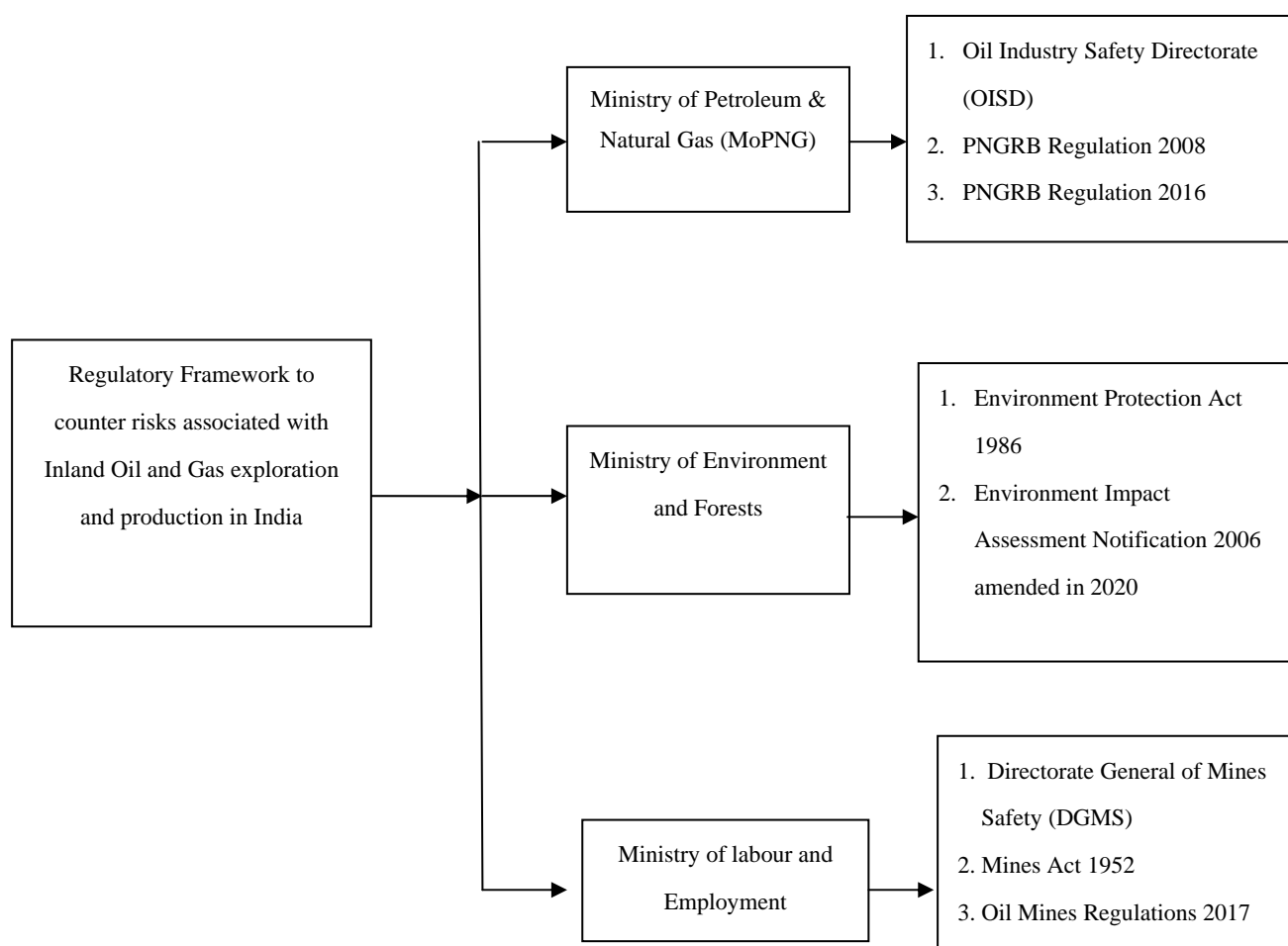


Fig. 2 Regulatory framework of inland oil and gas exploration and productions.

As far as the regulations of oil spill is concerned most of the Indian legislative Acts and regulations covered the incidents and provisions relating to the oil and gas spills that occur in the marine environment from the marine vessels. For instance, the Merchant Shipping Act, 1958 and Merchant Shipping (prevention of pollution of the sea by oil) Rules, 1974 cover oil spills, leakage and discharge from oil vessels into the marine environment. In respect of having so many inland oil spills in India, the deliberation of having a proper regulation or legislation in this regard has not been surfaced in India yet as delineated in Figure 3. Although

inland oil spills fall within the scope of the Indian Disaster Management Act, 2005 (DMA), but the provisions of such Act is only a responsive one i.e. just to provide an ad-hoc measure and response and does not deal with liabilities and its consequences from oil spills. There is no institutional regulatory mechanism to deal specifically with an inland oil spill in India comprehensively and whenever damages occur due to non-compliance or negligent actions restoration and rehabilitation process do not take place to its entirety immediately and effectively.

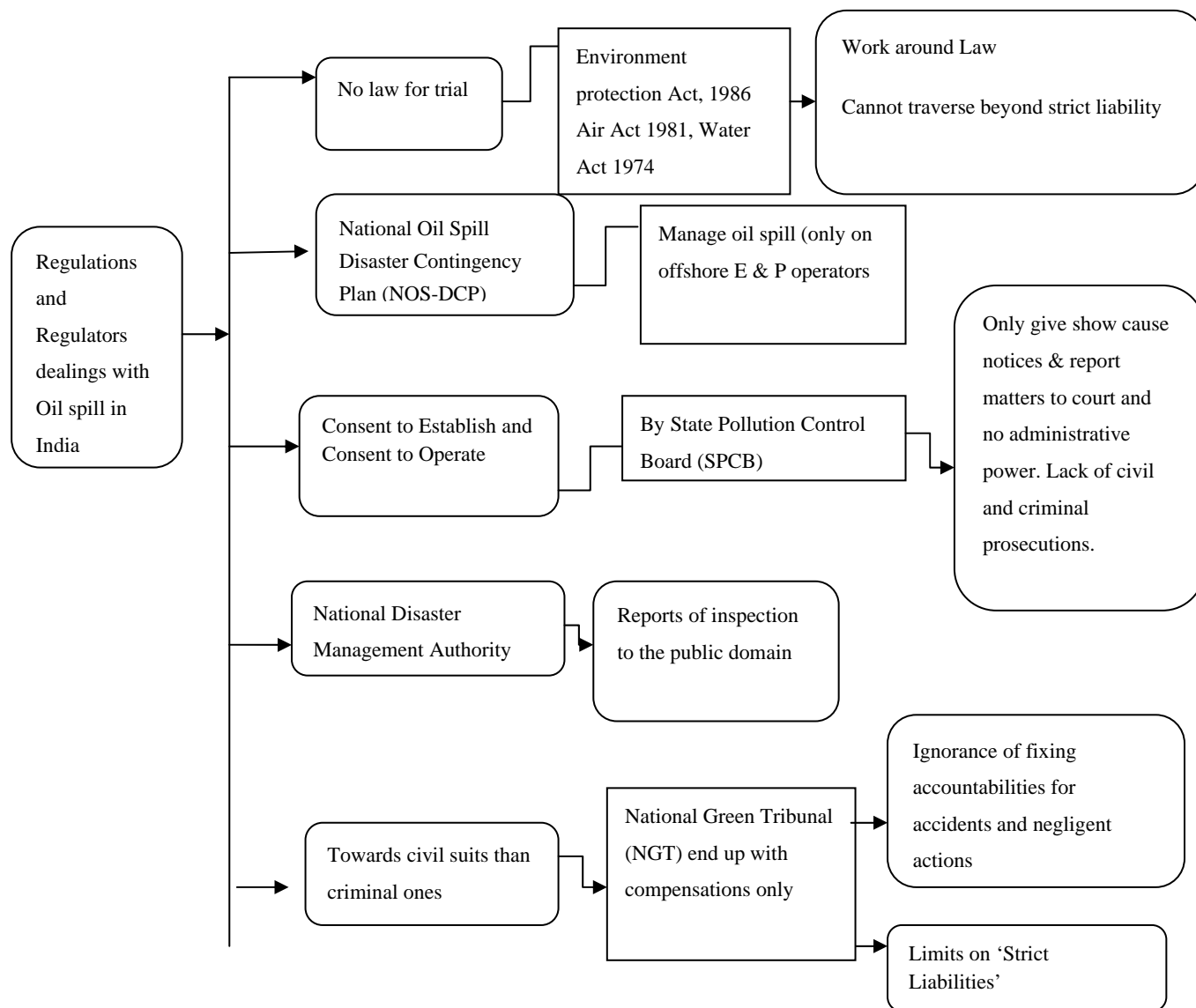


Fig. 3 Regulations and Regulators deal with oil spills incidence in India.

Fig. 3 shows the entire regulations that deal with the oil and gas industry’s incidents during their exploration and production (E & P) process in India along with the regional Acts and regulators that deal with the oil spills incidents. The liabilities for such incidents don’t fall under any criminal or heinous -act, but restricted to show cause notice to the Companies or agencies that are related to the matter. The National Green Tribunal is authorised to administer the matter related to oil incidents but the regulations limits the power of

the Tribunal to regulate not beyond the 'Strict Liability' which means the person who keeps hazardous substances on his premises will be held responsible, if the substances escape from the premises and cause any damages to the environment and human health with certain exceptions will be held liable under the rule of strict liability. Such principle of strict liability evolved in the case of *Rylands v Fletcher* and this rule follows in India as tortious liability in civil cases (Ezike, 2011).

5 Analysing the Gap in Regulations and Affixing Liabilities

A clear regulatory gap exists when it comes to fixing accountability be it on the count of compliance of standards or in the process of restoration and rehabilitation when some disasters do occur due to its intentional or negligent acts. However, in order to create an ideal scenario in this regard it is very important that the policy makers and regulators assess where the country stand both on the count of regulation and corporate action in the process of oil and gas exploration and production. This has been delineated in the form of an action quadrant in Fig. 4.

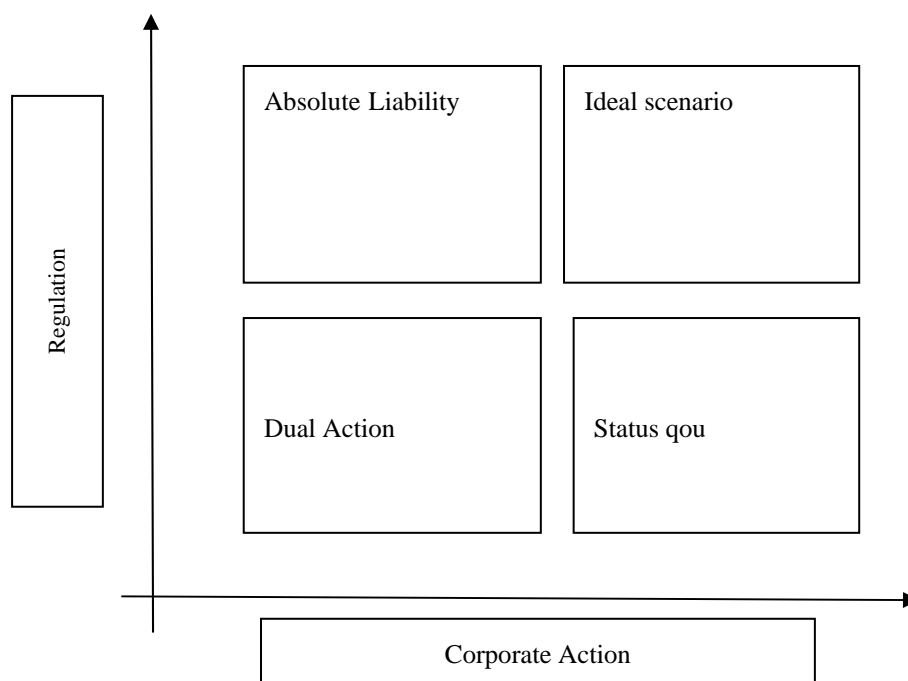


Fig. 4 Action Quadrant.

The Action Quadrant above indicates the required improvement efforts into four different scenarios (Covey, 2013) based on degree of Regulation on the Y axis and the degree of Corporate Action on the X axis. The classifications of action are as follows:

- Status quo (i.e. low regulation but high corporate action): Generally, the status quo can be maintained on the count of regulation as the degree of corporate action to reduce the probability of occurrence of any damage in the process of oil and gas exploration and production is high.
- Ideal scenario (i.e. high degree of regulation and high corporate action): This is the ideal scenario where the regulation is stringent and so is the corporate action. Here, the companies should follow the proper regulations for the companies along with the significant corporate action that materially impacts its stakeholders.

c. Absolute liability (i.e. high regulation but low corporate action): This is the scenario where the concept of affixing absolute liability arises due to the fact that corporate is negligent enough to adhere to the standards framed by the regulations. The rule laid down by the case *MC Mehta v Union of India* popularly known by the name of *Oleum Gas Leak case* held that the person or companies who carrying dangerous or hazardous activity will be held absolutely liable and the exception to the strict liability rule also wouldn't be considered in the absolute liability (Tyagi, 2020).

d. Dual action: (i.e. Low regulation and low corporate action): This is the scenario where improvement efforts to be made on both the counts – regulation as well as corporate actions to reduce the probability of occurrence of any damage to the environment and society at large due to the inland oil and gas exploration and production in India.

6 Conclusion

The oil and gas industry is an indispensable and indisputable fact of modern life in industrialised and developing countries alike. It is the fact that every stage of activity of the industry-exploration, exploitation, refining and manufacturing, storage, transportation and use is fraught with environmental consequences locally, nationally, regionally and globally. A thorough and careful scan of the matter, especially on the ground of incidents happened in India, confirm the hypothesis that the root cause behind most of the incidents have been and still are due to non-compliance of technical standards and/or negligence on the part of the management in the process of planning, coordinating and supervision. The recent *Baghjan Tragedy* in 2020 has made one harsh addition to the above, that violates the mandatory Consent that is required to Establish and to attain Consent to Operate the drilling operations both under the *Water (Prevention & Control of Pollution) Act, 1974* and under the *Air (Prevention & Control of Pollution) Act* and the Rules framed there under, poses a question of accountability in safeguarding the rights and interests of society and the environment.

The scenario in India based on the probe reports and regulatory framework in India as discussed above is that of low regulation and low corporate action as shown in the 'action quadrant' in Figure 4. Therefore, actions need to be taken both on the count of regulation and corporate action to reduce the probability of occurrence of any harm to the environment and society at large. The Management should have strict guidelines and standards that need to be followed by the concern members engage in any sensitive and handling risk activities of such industry.

There should be accountability of governmental regime to ensure that the oil companies self-regulate in such a manner that fulfils their obligation. As far as the regulation is concerned, it has now become an urgent need to enact a specific legislation with proper regulatory authority and strict guidelines, which would not only ensure safety concerns and guidelines, enforce compliance of the environmental norms and fixing accountability relating to restoration, rehabilitation and displacement of human and animals, but also to provide for a rule to fixing liabilities of the respondents. Concerted effort should be made in incorporating prescriptive rules to keep pace with rapidly emerging technologies and capture the continuous streaming of new risk information.

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