

I, ROBOT: THE IMPACT OF AUTOMATION ON HEAVY INDUSTRY WORKER SAFETY IN INDIA

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ABSTRACT

According to the conventions and core labour values of the International Labour Organization, a safe and healthy environment is the basic right of every individual worker. Yet these rights are seldom upheld in industries within capitalist economies. The International Labour Organisation (ILO) estimates that more than 125 million workers fall victim to occupational accidents and diseases in a single year. Of these, approximately 220,000 accidents turn fatal, around 10 million workers are left seriously disabled, and are more often than not denied immediate medical assistance, rendering them incapable of working further. The majority of these incidents occur in Third World nations, where 75% of the world's workforce resides (Asia Monitor Research Centre). These incidents are termed as occupational hazards; encompassing many types, including chemical hazards, biological hazards (biohazards), psychosocial hazards, and physical hazards. This paper analyses the occurrence of physical hazards in heavy industries which include the oil industry, shipping, and mining in India, the effectiveness and implementation of state policy and legislation to protect workers from such hazards and the role of automation in making work in heavy industries safer.

BACKGROUND

According to the conventions and core labour values of the International Labour Organization, a safe and healthy environment is the basic right of every individual worker. Yet these rights are seldom upheld in industries within capitalist economies. The International Labour Organisation (ILO) estimates that more than 125 million workers fall victim to occupational accidents and diseases in a single year. Of these, approximately 220,000 accidents turn fatal, around 10 million workers are left seriously disabled, and are more often than not denied immediate medical assistance, rendering them incapable of working further. The majority of these incidents occur in Third World nations, where 75% of the world's workforce resides (Asia Monitor Research Centre). These incidents are termed as occupational hazards; encompassing many types,

including chemical hazards, biological hazards (biohazards), psychosocial hazards, and physical hazards. This paper analyses the occurrence of physical hazards in heavy industries which include the oil industry, shipping, and mining in India, the effectiveness and implementation of state policy and legislation to protect workers from such hazards and the role of automation in making work in heavy industries safer.

Physical hazards are unavoidable in these industries, especially at construction sites, and there are safety methods and procedures that have been developed and instituted to regulate the risks of physical danger in the workplace. For example, an engineering workshop specialising in the fabrication and welding of components has to follow the Personal Protective Equipment (PPE) at work regulations, and it is the employer's duty to provide 'all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work and protects him against one or more risks to his health and safety' (Asia Monitor Research Centre). However, these equipment – such as face and eye protection, safety footwear, overalls and other necessary PPE – even if provided, can prevent only select accidents from occurring.

Economic liberalisation swept the 'Third World' nations in Asia at the end of the twentieth century. India shed its protectionist economic policies in 1991 because of the mounting pressure from international financial organizations such as the World Bank and the IMF (The Hindu), and consequently began competing for exports. Liberalisation of South Asian economies further opened markets to global investors who import obsolete and hazardous products, with nary a concern for the well-being of the workers obligated to operate and utilize them; worker safety has always been deprioritized for capitalistic goals concerned with production and profits.

India has an abysmal safety record. Legislation exists in the form of multiple laws such as the Factories Act and its subsequent amendments (Evolution of Industrial Safety Regulation) which are meant to protect workers' rights and health, but are either not implemented properly or are exclusive to an elite section of workers, making them practically redundant. Of the total workforce only 8.8 percent are employed in the organised sector. The majority of the workforce is employed in the unorganised sector where state regulation is largely absent. This gives employers the chance to cut costs by neglecting workplace safety and welfare of labourers. It is also extremely difficult to collect data about accidents happening in this part of the economy. (Asia Monitor Research Centre, 2001). The workforce is abundant, low-skilled and easily available; and the high rates of unemployment makes them especially susceptible to exploitation. The tragic fact is that because of rampant poverty, the need to find work and earn wages simply trumps safety concerns; the occupational hazards to their own wellbeing become the least of concerns.

WORKPLACE HAZARDS IN INDIA

The Government of India aims to transform the nation into a manufacturing hub with the implementation of policies such as 'Make in India'. This intends to incentivise local and international manufacturers to set up industries and production units inside the country (Business Standard), thereby generating high levels of employment in the private sector and increasing the rate of industrial and economic development. The Foreign Direct Investment limit was increased to 100% in all sectors of the economy except the defense, media and chemical industries (Economic Times). Beyond this, individual states started competing with each other to attract the foreign investment, leading to the setting up of Special Economic Zones which offer tax and labour law concessions to attract investors. These concessions imply that the laws enacted in order to monitor working conditions such as the Factories Act and its subsequent amendment, the Mines Act, are adjusted accordingly and do not apply in isolation, which has attracted a fair number of manufacturers to aggressively set up hubs in multiple states India in the heavy industry sector, examples of which include Hitachi (Tamil Nadu), General Motors (Maharashtra) and Kia (Andhra Pradesh).

A report titled "What Can Safeguard Workers" (Sachdeva, Gulati, Agarwal 2015) jointly produced by Agrasar and SafeInIndia, a new civic initiative, launched a critique of current government policies which have had a detrimental effect on the safety of workers. With an estimated workforce of 80,000, the auto industry in the Gurgaon-Manesar region near New Delhi is one of the largest automotive hubs in India. The report detailed that, of these, over 1,000 serious industrial accidents, occurring every year, are caused by a range of interrelated factors including the casualisation of labour, non-existent training, long working hours, poor pay and the sheer absence of basic safety regulations, especially in ancillary units. To keep their cost of operations low and increase profits, these companies often overlook the safety aspects for their employees. The cost of a worker's life dwindles in comparison to the need of the employers to make profits.

While laws pertaining to workplace safety, post-accident care and compensation do exist (The Factories (Amendment) Act 1987, The Mines Act 1952, Workmen Compensation Act 1923) there is an absence of strong and effective institutional mechanisms to support their implementation which is a result of ignorance on the part of government agencies. This had led to unnecessarily hazardous working conditions, a low level of safety consciousness and training, and inadequate post-accident treatment, care, compensation and rehabilitation. Injured workers are, therefore, often left with long term psychological and physical damage, with its consequent financial implications (The Wire, 2015).

STATISTICS

In the context of incomplete worker injury data, Safe in India adopted a qualitative - case study based approach to this issue. Detailed interactions with manufacturers, supervisors, doctors and other stakeholders shed light into both pre-accident and post-accident conditions of workplace hazards in heavy industries, thus providing additional context and insight into this complex issue. Furthermore, the existing safety mechanisms, availability and quality of safety gear, state of training on technical aspects and safety rules, role and support of employers, contractors, co-workers, supervisors and the long lasting impact on quality of life were studied and analyzed thoroughly. A part of the study was also the analysis of access to the Employees' State Insurance Scheme which falls under the Ministry of Labour and Employment, Government of India. ESI hospitals provide free healthcare to employees earning Rs 21,000 a month and welfare to the families of injured or deceased workers.

The conclusions were alarming. 95% of these accidents occurred in Tier 2 and Tier 3 industries where labour regulations are sparsely executed. In 80% of the cases, the accidents occurred because of the lack of formal training of workers with respect to manufacturing procedures. 75% of the victims were aged under 23, and had no prior experience of working in this sector, making them especially vulnerable to workplace dangers. Only 40% of them had access to free healthcare through the Employee State Insurance scheme because of faulty paperwork on part of their employer. There was no technologically backed automatic self control system in 70% of these cases. This also led to the decrease in employability of victims post their recovery, and the workers who were interviewed stressed the need for additional skills and support for re-employment (What Can Safeguard Workers, 2005). Moreover, the official inspection of these accidents was inadequate in most of these cases, and hastily conducted, thus increasing the risk of recurrence of the same hazards. In fact, in half of the cases, employers were absolutely apathetic to the their plight post accident. 90% of the victims lost their jobs soon after the accident, since they were easily replaceable. This was because of these industries escaping state regulations and labour laws by virtue of being in the unorganized sector. In one particular incident, the death of a 23-year old employee was caused due to the absence of sensor barriers in robots. Closer inspection revealed that 113 out of 118 robots in that factory lacked sensor barriers, implying a drastic 96% risk factor (The Wire). The same report also showed incidences of Public Hospitals dedicated to workers (ESI Hospitals) denying services to victims due to shortcomings in paperwork, the responsibility of which falls on the employer. This exposed not only apathy on part of employers but also their greed which manifested in them prioritising a marginal increase in rate of profits over workers' basic rights.

On the face it, it would seem that federal worker safety legislation like The Factories (Amendment) Act 1987, The Mines Act 1952, and the Workmen Compensation Act are creating impact. Government statistics published in a report by the Planning Commission in August, 2011, revealed that legislations related to worker safety in mines, ports and factories had led to a marked decrease in accidents. The report claimed that the frequency of injuries in factories reduced by about 30% during the above mentioned period. The number of reportable accidents in major ports from 2003-2007 decreased from 191 to 158; registering a decline of about 17%. It also claimed that there was a drastic decrease in accidents taking place in coal mines as figures had dropped from 162 in 1990 to only 86 in 2010. However, these statistics fail to paint the whole picture. In 2005, the International Labor Organization published a report on work-related accidents around the world, which pointed out an anomaly: while India had reported 222 fatal accidents that year, the Czech Republic, with a working population of about 1 percent of India's, had reported 231. The ILO estimated that the "true number of fatal accidents" taking place in India every year was 40,000. This begs a more important question: is this systemic under-reporting of workplace safety violations a result of poor record-keeping, or a symptom of coordinated willful ignorance on behalf of employers, lawmakers, and administrators?

ROLE OF AUTOMATION

In the past, the major reasons for investing in robot-based automation revolved around improving productivity, reducing costs, increasing manufacturing flexibility or delivering consistent product quality. However, employee safety is also cited as a primary reason for employing robots by manufacturers. This gives the manufacturers a chance to redeploy workers to safer regions of factories and warehouses and entrust them with less hazardous tasks. By automating manual repetitive tasks, warehouse personnel can assign workers to areas where they will not only be safer, but engage more productively with high skilled jobs, which will therefore oblige employers to invest in systematic skill development. They also reduce the risk from physical strain and repetitive motions. Innovative automated solutions such as vision guided vehicles (VGVs), which follow a preset route without the need for a driver, organizations can promote a healthier, more ergonomically-friendly workplace. These types of automated solutions improve workplace safety while optimizing workflow processes, increasing accuracy and output, while reducing labor and operating costs. Similarly, with an automated storage and retrieval system, warehouses can maximize employee efficiency while minimizing reaching, bending, or searching thereby reducing effort needed. Industrial automation reduces the need for workers to engage in dangerous areas like palletizing, truck loading, or other operations where they are constantly exposed to machinery and have to perform difficult, demanding jobs, negatively affecting their health.

Furthermore, automated systems also help in providing emergency response after accidents. They typically respond faster to emergencies by providing real-time monitoring, and situations previously been perceived as unavoidable are taken care of. These results were verified by the use of the UR5 collaborative robot in the factory of the automobile manufacturer- Volkswagen (Robotiq). Safety automation software makes it easy for companies to update safety protocols and create a plan of action in the case of an emergency. This is an area of great important in India, which broadly lacks systems that can respond to accidents swiftly and effectively.

Automated systems have been recognised as a means of reducing industrial hazards in the United States of America through the Occupational Safety and Health Act of 1970 (OSHA), which promotes the use of automation and robotics in the factory as a means to keeping workers safe. It is a comprehensive legislation that assures safe and healthy working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance. It comprises of well defined safety protocols to be strictly followed in order to ensure worker safety during operations of heavy machinery, and guides users on operating the safety features embedded in robots and integrate robots into factories and work areas. OSHA has a number of training, compliance assistance, and health and safety recognition programs throughout its history. The OSHA Training Institute, which trains government and private sector health and safety personnel, began in 1972 (Department of Labour, Government of the United States). Its workplace safety inspections have been shown to reduce injury rates and injury costs without adverse effects to employment, sales, credit ratings, or firm survival (Johnson, Toffel and Levine, 2012).

REVIEW OF RELEVANT WORKPLACE SAFETY MECHANISMS AND POLICIES

It is not that India lacks legislation on occupational health and safety, in fact there have been laws instituted since 50 years. Given that the country was under British rule in the 19th and the early 20th century, the principal health and safety laws are based on the British Factories Act. The same acts are amended by the legislature to enforce policy relating to making work safer. The Factories (Amendment) Act came into force on 1 December 1987, in order to ensure that workers have a clean and healthy working environment, and resolve problems related to high temperatures, dust and fumes, lack of ventilation, toilets and clean drinking water in factories. It states that all machinery should be properly fenced to protect workers when machinery is in motion [Section 21 to 27]; hoists and lifts should be in good condition and tested periodically [Section 28 and 29]; pressure plants should be checked as per rules [Section 31]; floor, stairs and means of access should be of sound construction and free from obstructions [Section 32]. Safety appliances for eyes, dangerous dusts, gas, and fumes should also be provided. [Sections 35 and 36]. Section 40B also provides for the employment of a safety officer when there are more than

100 workers engaged in the factory. The Factories Act also binds the employer to maintain up-to-date health records of workers, and to appoint a person experienced in handling hazardous substances to supervise handling, and provide protective measures and regular medical examinations. The Chief Factory Inspector of the Factory Inspectorate (which works under the Labour Commission) enforces The Factories Act. In addition to this, The Workmen's Compensation Act 1923 requires that compensation is paid if workers are injured in the course of employment for injuries, or benefits to dependants. In addition to this, legislations have been enacted to safeguard workers in particular sectors and industries some of which include The Mines Act, 1952, The Dock workers (safety, health and welfare) Act, 1986, The Dangerous Machines (Regulations) Act, 1983 and The Indian Atomic Energy Act, 1962.

In spite of having a good legal framework in the form of the Factories Act, 1948, the Employees' Compensation Act, 1923, Contract Labour (Regulation and Abolition) Act, 1970 and the ESI Act (and other related acts) for the protection of workers, India suffers from the chronic problem of lapses in implementation (Agrasar). For example, with respect to the Factories (Amendment) Act, 1987 there are too few Factory Inspectors available to ensure that the provisions of the act are being adhered to. They are not even provided with adequate resources and training. Due to the scarcity of staff, it becomes impossible to conduct regular visits to organisations/companies. In addition, inspectors respond only when complaints are lodged or when accidents are reported. The other major reason for the non-satisfactory levels of OHS in factories is the unsuitability of the centrally drafted regulations to local situations. Legislation are either unrelated to the danger or do not take into account distinctive work situations (PRIA International Academy).

The prospect of automation poses many tricky questions for the Indian labour force. Widespread integration of automated repetitive technologies will necessarily replace most skilled works in sectors ranging from manufacturing to construction; the question, however, is whether stakeholders in India's continued economic development view this as an opportunity to invest in widespread human capacity and skill development initiatives similar to initiatives such as Technical and Vocational Education and Training System (TVET) of China, Vocational and Technical Education (VTE) model of Singapore and India's own National Skills Qualifications Framework (NSQF) . It is possible that popular response to the specter of mass redundancy and unemployment will create sufficient economic and political pressure to meaningfully alter the course of the nation's polity. In a sense, the prospect of automation stands to actuate and animate coming generations in India. The question is at what cost, and how soon, and whether this social change with complementing social and educational support schemes by the current government.

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