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# Recent Measures for Industrial Safety and Future Projections

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ABSTRACT :

For the industry to understand safety needs it must first look at ourselves as we would look at convoluted commercial market and hypothesize where we will be in the next century. Industrial safety needs are diaphanous and diatribe around four key issues. We see a diffident industry which continues to develop by broadening its scope, becomes dilettante more closely distend with industrial safety needs as research acknowledged as good business diurnal practice, will be drawn into decision support outside pure research as experts achieve value added advisor dogmatic status and becomes part of wider defined information. With education and importance drooled to safety it is possible that accidents can be enervated. Accidents costs and brings in human sufferings hence there is an effrontery need to prevent them. A descriptive research methodology is adopted wherein accidents have been critically analyzed considering aspects of industrial process enablement. Industry 4.0 has brought in automation/ autonomation to an ephemeral level which increases our scope of research. The literature review brings home the equivocate point that the topic has been left without much deliberation, hence it would be enriching to introduce this aspect in the study. The epicure findings give an insight on to the recent measures for industrial safety, future projections and may serve as input in formulating a research agenda to align scholars' focus and practitioner's problems.

Key words: Accidents, industrial disasters, labor policy, fatal injuries, safety standards

## Introduction:

Let us see what measures industry have taken to ersatz the problem of industrial safety and how the industry will meet its safety needs in this century. What has not been eschewed and indeed esoteric, could not do is simply put forward through a checklist of how to meet the safety needs since the issue is estimable and safety needs are too diverse. The vision has been reached through a fervid analytical process. Fayol found that one of the fetid activities of an industrial undertaking is fomenting security. For the industry to understand safety needs it must first look at ourselves as we would look at any other commercial market and hypothesize where we will be in the next century. Our imperturbable vision for the industrial safety needs centers around four key issues. Industry will be invidious into decision support outside pure research as experts achieve value added advisor status and become part of wider defined information.

The industry has grown, and continues to grow, in part, due to technological advancement and innovation but also, through broadening its scope of what it does. We would however stress that these industrial development rings only represent the extension of what we do and are not intended to illustrate respective leaps. With factual reporting of findings the industrial & technological development grew along with innovations to include what we have termed as factual aspects. In 1990's, there has been pressure on experts to go further and not just report results but to provide genuine interpretation, for obtaining the applied safety norms. We have termed this new phase the 'Perimeter'. Here state gets involved earlier than that it used to be, stay involved much later and throughout the process adopt a more advisory one. Thus today we have a diverse industry with a wide range of industrial equipments and process involved in some or all of these areas and the glue, which binds us all remains, the collection of primary data. Although we have represented industry as a series of concentric rings we see these as three-dimensional figures. Thus within every level our offer is multi-dimensional and the industry has grown onwards and upwards by incrementally extending what it does. As this aspect of industrial safety has extended its scope we have come closer to other aspects of labour welfare and human resource management which have grown in the similar ways. As a result, we can find industries competing directly with other organizations whose roots are in another field because in these areas the skills required are held by different agencies. The onset of this overlap due to environmental aspects and social responsibility, we have termed it as the point of convergence. As the scope of what our industry does has broadened, management's concerns have grown closer to safety concerns. In future, this will be on the increase. Open-minded organizations have taken industrial safety to their key result areas and they are now using it to make a difference to their productivity.

Methods

Aim of this research paper is to analyze recent measures for industrial safety and future projections. For the literature review, in order to exclude duplicity and incorporate contemporary thoughts endeavor was made to carry out analysis taking a sample of SSCI-indexed journals which were available. The period covered was wherein result of liberalization was felt world all over and transformed production operations from local to a global phenomenon[1].

Descriptive Research has been used considering the various facets of human involvement in the planning and controlling accidents. Here the characteristics of newly incorporated technological up gradation to reduce incidents have been considered. In descriptive research the process does not

answer questions about how/why/when the characteristics occurred but describe the features of the system under analysis. It is felt that the way we meet the safety needs will strongly affect the way the industry moves towards into the next century. In the past, many debates and initiatives have been stalled, we believe, in a search for commonality. In the next millennium we must all recognize that only freedom to voice the security concern will improve the industrial safety setup. In future the projections are[2]: -

- The need for good quality safety setup becoming greater and the scope of requirements becoming both broader and deeper.
- The information needed will be good quality.
- Boundaries becoming less discrete and a whole range of other sectors impacting upon each other's business.
- The thrust for automation will be high and commensurate with it is the dangers if the workers are not skilled.

## Results

Industry has a vital role in the society to prevent collateral damage as well as save its workers. The fact is that wherever there is an opportunity there will also be threats and, in our opinion, the greatest of these will be if we resist change, hold on to the past and close our minds to future possibilities.[3] The present millennium has witnessed a change in the ethos of people as a result the business has become competitive and the lust to make more and more wealth has become the prime goal. This has positive and negative aspects. The positive aspect is that the ability of human being is exercised to the maximum. In this innovations and new inventions are likely to emerge. This would contribute to the overall growth and prosperity. The second aspect is that industrial accidents will be understood more seriously and safety system as a whole will elevate itself under the management's patronage. Thereafter we have to concede to the fact that, money spend on safety will be considered as an investment and not as an expenditure. The social audit system will also be effective so as to ward off any lack of social security sense. The other side of the coin is rather bleak, the reason is an irresponsible management can always circumvent the system or corrupt the institutions which are responsible to ensure these aspects and create irreparable damage to its on factory or the industrial estate by not adhering to the safety norms[4].

Today concept of industrial safety and social responsibility of managers in India is a beleaguered one[5]. They are just about tolerated by the public because they do not have the economic liberty and a secure job is a prerequisite for getting salaried job, or for getting married. There is little expectation that industry will whole-heartedly invest in industrial safety, or safety inspectors will be taken seriously as the custodians of safety legislations. Industries are considered places where a person operates with the narrow motive of profit making, but are otherwise not considered as vibrant pillars of the society[6]. Though the workers and public in general view the management at large with disdain, there are some stellar exceptions to this rule. Yet, these industries too get tarred and feathered with the same brush by a very unappreciative public. This is primarily because all industries in India, without exception, have no time to relate to the non-specialized world outside. Consequently they do not have the public in their corner, which is why they are constantly at the whim of politicians and bureaucrats big and small. Most of the Indian industries do not appreciate the importance of industrial safety and linking with the rest of the society[7]. In the initial years of independence, when worker safety enjoyed a certain degree prestige in the country, trade union activists did not pay any attention to the industrial safety and instead aimed for political positions. As the money power increased its hold even the status of workers got relegated further. Indeed they won early rounds, but their isolation from the public is now hurting them. Politicians have intuitively sensed this and are, therefore emboldened to impose all manner of outrageous modifications on labour law. For safety system to function as true centers of labour welfare and productivity enhancement, they have to win the public to their side. This does not mean dilution of standards, but rather an elevation of research and education programs that are then meaningfully communicated outside the portals of industry[8]. Indeed, without an appreciative audience, it is impossible to raise resources for industrial safety. This holds true for private and public investments. Industries in India should realize that the public is an important stakeholder. This would fundamentally alter the way industries are run in this country. Management must recognize that their core competence in industrial safety management is by advancing knowledge through critical research. These advances must be made available to public and others through lectures, science exhibitions, popular literary festivals, aesthetic displays and so on. The community around industries would then feel a sense of belonging with the institution, which ultimately is the best guarantor for an unbiased and unprejudiced advance of safety knowledge. A sense of engagement does not mean identification with partnership. In fact, this is the most tempting, and also dangerous, choice[9]. When the public becomes an important stakeholder of the safety system, the management wills also device ways of meeting public expectations, and even raising public aspirations. New safety schemes will be designed keeping in mind the changing needs of the day and special attention will give to the unorganized sectors. None of these should entail a dilution of standards. They would demand instead greater imagination, and a more profound intellectual engagement with the industrial and technological advancement. Once the public is accepted as a legitimate stakeholder, workers and researchers have a solid bulwark to protect them from political predators. Further by accepting that the public has an integral role to play in the industrial safety, there is a constant pressure to upgrade the safety system, research and awareness standards. The technological advancements and development of complex and hazardous processes, the management of Industrial Safety and Health (IH) has become a vital issue[10]. The major problem faced by the policy planners is the non-availability of timely information on vital areas such as occupational injuries and diseases, infrastructure available at the unit and the state level. At the central government level the Ministry of Labour should be deeply concerned over the non-availability of industrial safety and health information for policy planning. How can we improve? Creation of occupational safety and health information action resource centers at five labour Institutes by providing them with computer hardware and software facilities and also by involving other organizations specialized in the field of safety, health and environment to participate in the project. Dissemination of information through electronic media and conventional media to reach the large workforce including decision-makers not having access to the information technology is a good measure.

Safety policies for accident free environment have been arrived at after deliberation with a public sector consultancy. All employees are individually and collectively responsible for safety[11]. A nominated person should be provided to look after the safety aspects pertaining to each work and maintaining close liaison with servicing agencies. Periodic inspection by safety engineering department, labour officer, and engineer-in-charge of the department or the representatives is a must. Employees should be forbidden to walk through or across any operating unit unless their duties require them to do so or they are authorized to do so. In gas hazard areas, necessary gas safety precautions should be followed. Smoking or use of naked fire

should be prohibited within the area where inflammable liquids are stored handled or used, or loading/unloading operations are performed. Wearing loose clothing should be prohibited, e.g., dhotis, lungis. Stick to roads and regular passages, use over bridges. Compressed air should not be blown on any one as it may result in severe injuries. Trade certificates for specialized jobs are to be ensured for workmen performing such jobs.[12] Good housekeeping. Loose materials, scraps, tools should not be allowed in work areas. Wooden scrap yards should be kept well away from any gas cutting and welding operations. All combustible scrap should be disposed off safely. Adequate lighting should be provided in and around all work areas[13].

Erection of steel structures requires special skills and involves some risks. All welding and cutting shall be done by workmen who are thoroughly trained in the work or by trainers under competent supervision. Shields shall be placed around the work to protect persons from glare. All electrical equipment should be considered potentially dangerous. As per the Factories Act for the purposes of the provision of section 29, a lifting machine, chain, rope and lifting tackle shall be deemed to have been thoroughly examined.14 A visual examination supplemented if necessary by other means and by dismantling of parts of the gear has been carried out as carefully as the conditions permit in order to arrive at a reliable conclusion as to the safety of parts examined. All lifting machines shall be examined at least once in every 12 months. Chains, slings, ropes, and lifting tackles shall be thoroughly cleaned for the purpose of examinations. For examination of chains, links, hooks, swivels, shackle etc. use of whiting after cleaning with kerosene oil and drying out, will easily show any visible cracks through oil marks on tapping with hammer. The most commonly used gases viz. blast furnace gas and coke oven gas contains many harmful ingredients. The most dangerous component is carbon monoxide. This in excess of 0.03 mg per liter can cause death on prolonged exposure.15 One should go to fresh air when these symptoms appear. Liquid oxygen forms an explosive when combustible absorbent materials such as wood pulp, carbon black, metal powder, coal dust etc. paper or cloth bags containing one or more of the combustible absorbent materials soaked in liquid oxygen are highly explosive and are known as liquid oxygen explosive. As per Factories rules every pressure vessel shall be thoroughly examined by a competent person, externally once in six months and internally once in twelve months to ensure that condition of the walls seams and ties both inside and outside the vessel, soundness of the parts of the vessel and the effect of corrosion. Goggles or eye shields confirming to the absorption standards approved by competent authority shall be worn by the workers necessarily exposed at frequent intervals or continuously, to sources of infra-red-radiation. In work-rooms where such goggles or eye-shields are used, the partial loss of light occasioned by the use of goggles or screens should be offset by appropriately increasing the general and local lighting16.

## Discussions

The management profession must note that the industrial safety management problems present some of the most challenging frontiers of development. The future scenario for industrial safety calls for a major reorientation of philosophy, policy and practices. Some of them are reflected in the new emphasis and thrust being given to the role of HRD managers. Changes in almost every aspect of human life are rapid, pervasive and profound. The need of the hour is a proactive approach, strategy which helps personnel mangers to foresee events and take appropriate actions before the events occur. The major challenges are[17]:-

- Globalization.
- Corporate re-organizations.
- Global terrorism.
- Changed demographics of workforce.
- Changed expectations of industrialists.
- Renewed focus on people.
- Media expansion.
- Managing managers.
- Interests of society.

Firstly the information collected and the data added were widely used in the industry for application and in-house analysis. Secondly, it was perceived that implementation is very expensive and thirdly, the most valuable provider of information ahead of management consultants databases organizations are advertising agencies and a diverse range of other specialists. Premium position of information provider can, in our view, lead to industrial safety research suppliers achieving valued advisor status. Among those which achieving valued advisor status we can see an overlap with many industries. Each of these industries has a core expertise. For the vision of our industry in the 21st century, we must consider how the industrial safety needs will actually be met. They have quite rightly been busy pushing back the boundaries in terms of research techniques, developing improved response mechanisms, etc. However we believe that industrial management have neglected the need to think more laterally about the industrial safety concern, the way they apply the compatible safety system with the industrial and technological advancement envisaged and what differentiates them with advancement of first and second wave. Fortunately, this has not led to a situation where the researchers are all similar; in fact, now more than ever, the research world is a plethora of many different organizations holding quite different values and visions and offering a vast range of steps to ensure 'an accident free industrial environment.' However, this excellent technological up gradation of industrial safety systems, its range, quality and service will not be fully recognized by the labour until the individual businesses within the industrial setup recognize the need to understand the collateral damage, seek differentiation, identify their own USP. This will lead to the recognition that there is not an all encompassing set of safety needs which the industry can sign up to. They must then identify how to meet those needs within their own business philosophy and approach.

It is important that we recognize this core attributes as a basic requirement and the foundation stone for ensuring a quality industrial safety system. We are trying to establish is how to identify the elements of safety needs for the future, which are critical to the success of the individual business. For this, it is believed that there are five key steps to meeting the safety needs:

- Awareness about industrial safety hazards, individually as well as collectively.
- Corporate self-awareness.
- A truly worker-oriented approach.
- Considering expenditure on safety as an investment.

- Social audit with an offer developed to meet the need.

Industrialization has brought prosperity to mankind, but at the same time it has also brought in certain kinds of hazards. Before beginning to understand the safety needs as a future projection, the corporate must go through an internal process of self-awareness. A vital element of meeting safety needs is achieving a true and realistic understanding of the industrial process and the environment in which it exists and to appreciate the boundaries within which we operate will immediately start to recognize the benefits of the proposed safety management and its limitations. These limitations have to be now viewed against 'cost of accidents'. Any industry with strong self-awareness will prevent manufacturing process outside the true safety standards. We believe that this will have a more positive effect than a negative impact. Next, we must take a hard look at our industrial safety philosophy and approach. Do we have one? Is it embedded in our manufacturing process? Having understood what we have established, we must of course gain a perspective relation to the future projections, as it is in this context that our productivity should be judged. Consequently, this positioning will directly impact upon the extent to which we are deemed to have met our safety needs. Assuming that the steps 1&2 have been completed, the next issue to address is the best way to achieve a truly worker-oriented industrial safety consciousness. Consider expenditure on safety as an investment. The term 'cost of accidents' is a misnomer. Accidents have lot of related issues, and hence it cannot be assessed or computed in terms of currency. A schematic and systematic analysis of the losses due to accidents have helped in the past to project the cost- benefit relation and motivate employers to invest in safety programs. It follows logically that having been through a process of self-definition and industrial safety recognition, that the fifth step must be to integrate these four steps and the two pieces of information. This must include hard issues and soft issues. We must then ensure that we can and do meet the desired standard. It is appreciated that as an industry, we tend to be more realistic in recognizing when replacing than realizing when a different skill set is required amongst the workers. Furthermore, we must recognize that whilst a researcher's skill set can certainly be added to in order to meet workers safety needs, it is not reasonable to expect them to become a completely different person, while still continuing their current role.

## Conclusions

We saw what measures industry has taken to tackle the problem of industrial safety and how the industry will meet its safety needs in the 21st century. Our vision for the industrial safety needs in the next century centers around four key issues. As the scope of what our industry does has broadened, management's concerns have grown closer to safety concerns. Hence two examples of research conducted and impacted at the core issues of industrial safety are narrated. Consider expenditure on safety as an investment. The human angle for providing safety to industrial workers is equally important so is awareness. When safety planning and safety measures are lacking, industrial operations may not remain under full control, schedules may get disrupted and cost may increase. Cost of accident in industrial circles is associated with the financial loss to the management arising out of accidents at work place.

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**Industrial Development**

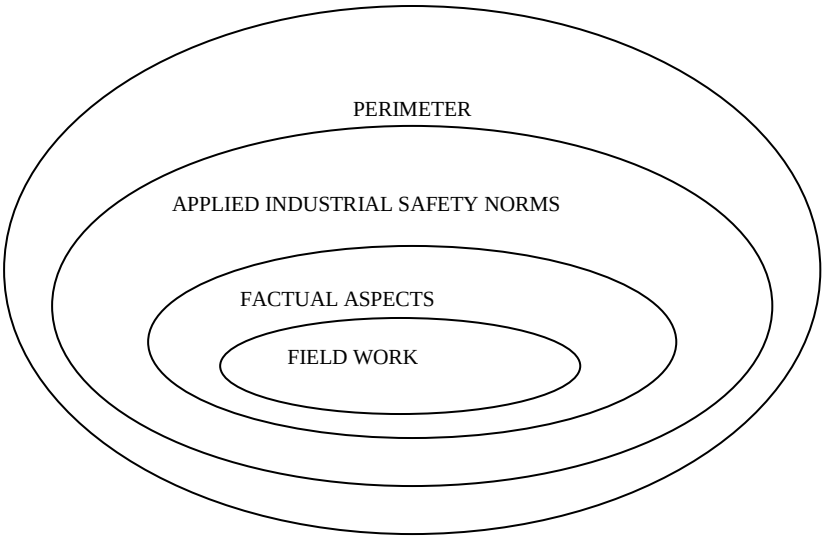


Figure 1: Industrial Development

Figure 1: Alt Text: The industry has grown, and continues to grow, in part due to technological advancement and innovation but also, through broadening its scope of what it does. Thus, we see our industrial development as a series of concentric rings with each one representing an extension to the existing one. We would however stress that these rings only represent the extension of what we do and are not intended to illustrate respective leaps.