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FROM THE DESK

Effective implementation of Occupational Safety and Health Management at micro level faces mainly two hurdles. One is, not much of interest and consequential efforts are taken by the key players and the second is, in spite of taking reasonably practicable measures, encouraging results are not forthcoming. Solutions for solving the first problem are well known. The second problem can be effectively tackled by taking a holistic approach which should cover all managerial activities. Management of Occupational Safety and Health is good business. This is a good business not only in terms of tangible financial achievement, but also improvement in industrial relations, over all public image and also contributing towards welfare of the society in general.

The areas where efforts are to be focused are chosen by the managements on the basis of an in-depth analysis of the whole situation. The cover feature of this issue has tried to throw light on the process of identification of critical areas and has also tried to offer some standard solutions. It is obvious that dealing with the problem in its totality with the help of a single article is not possible. We hope that the readers will take a cue from this article and try to implement the ideas at their work places.

This organization will always be ready to render any further help in this area.

(S.K. SAXENA)
EDITOR -IN-CHIEF

HOLISTIC APPROACH TO ACCIDENT CAUSATION AND PREVENTION S.G. DARVHEKAR

Accident prevention is an integrated approach to identify all downgrading incidents involving all agencies such as employers and their organisations, workers and their organisations, federal and state governments and public who have to have a sound foundation of reasonably adequate knowledge, desired skills and positive and proactive attitude. Accident prevention has to be perceived not as a separate and independent discipline of science but it needs to be interwoven strongly with any other management function. Quite often than not, an unified slogan of “Safety First” is chanted more specifically during the celebration of Safety Week every year which is indicative of partial treatment to safety compared to other disciplines and a negative and biased treatment meted out. It is felt that just chanting a slogan of ‘safety first’ is not more the necessity but making **safety, health and environment** a way of life and work. These three essential mantras need to be integrated in design, commissioning, operations, maintenance, demolition, etc. in any economic activity.

There are various work related statutes in the country concerning safety, health and environment such as The Factories Act, The Dock Workers (Safety, Health & Welfare) Act, The Indian Petroleum Act, the Indian Explosives Act, etc. and sets of Rules made thereunder. The Ministry of Environment & Forests have also come out with the Environment Protection Act and sets of rules made thereunder to protect the general environment. These acts and rules have taken into consideration adequately various requirements of the articles under different ILO Conventions and Recommendations. However, mere framing of Acts and Rules would not improve the status of Safety, Health and Environment at workplace and outside the workplace provided everyone in the country carrying out such activities and/ or are concerned and seized with these issues demonstrate it through his visible contribution.

It has been widely accepted world over that mere enforcement of Acts and Rules will not bring about the desired positive results. More and more of education and awareness amongst the employers, workers organisation, management, workers and the public is essential. An intense desire to honour the Rules, Standards and implementation of the same in total spirit would bring about the expected result.

Any amount of stringent provision under various Acts would rather become counter productive. In the light of above discussion, it would be worth understanding the concept of causation of the accident in any economic activity and appropriate control measures needed to be taken.

In today’s world, international standards have become the focal concern for economic activity, carried out in any part of the world for reinforcing trustworthiness of the enterprise so far as its quality is concerned. On the same analogy, national or international standards concerning occupational safety, health & environment need to be perceived as an essential instrument. This will ensure not only the safety in design, commissioning and operation of that economic activity, but also the safety of the product being used anywhere in the world with the prescribed limitations. Hence, a third party accreditation, so far as occupational health and safety is concerned needs to be introduced to ascertain the status of safety and health at the enterprise level and user applicability in general. Hence, management systems on safety and health as shown in the figure need to be established, implemented and reviewed periodically. Please see **FIGURE 1**). If these systems are implemented in the right earnest, the probability of occurrence of accident would definitely be averted. The resultant effect of any accident or incident has undergone the changes from that of the personal injury to property damage and other business losses. Today the perception of the result of the

accident is seen as not just the personal injury and property damage but also the losses on account of fire, explosion and toxic release, product serviceability, product liability, pilferage, theft and any other loss of time, etc. The accident also has undergone a sea change so far as its definition is concerned. Today it is largely accepted that accident is an unplanned, uncontrolled event arising out of and in the course of the employment of the person(s) having potential to cause any of the losses mentioned above which occurs when there is an exposure of an object or a subject to any form of energy above the threshold limit.

The accidents by and large are caused as said and advocated by the scientist Heinrich either because of unsafe conditions or the unsafe actions is no more valid. These unsafe conditions and unsafe actions are seen as the immediate causes or symptoms which arise because of either the Job Related Factors or the Personal Factors. The Job Related Factors constitute factors such as inadequate or improper purchase and maintenance policy, non existence of safe operating procedures for carrying out hazardous or dangerous activities, etc. Personal factors constitute no/ inadequate or improper knowledge, dexterity, attitude, perception, values, etc. These two factors, i.e., the Job Related Factors and Personal Factors are considered today as the origin of the accidents and hence, need to be controlled by the management before any operation or activity is undertaken. Till mid 70's, the above concept was accepted. However, in the present day context, the philosophy of accident causation has been viewed as not merely the unsafe conditions or unsafe actions or the origins of the accidents but seen as a result of no/ inadequate or improper management systems for safety health and environment. Any system has to include the policy, the objective(s), agencies involved, their role and responsibilities, the procedures for each element of the system and mechanism for review and evaluation of that system. Generally accepted systems on safety, health and management include system for (a) Monitoring (b) Health (c) Education and training (d) waste disposal (e) permit to work (f) emergency preparedness (g) maintenance

(h) recruitment and placement (i) hazards identification (j) hazards control (k) documentation and (l) maintenance.

These systems have to be integrated with the quality and environmental systems as applicable nationally or internationally.

Any incident of an accident could also be caused because of human failure which may be attributed to overload, trap or decision to err. 1. Overload is a mismatch between the capability of a person and the load to which he is subjected. By and large, the capability could be influenced by natural endowment, nutrition, pressure, knowledge, experience, attitude, drugs, etc. whereas the load could be of four types namely - (a) task load comprising physical load and information processing load, (b) environmental load caused due to improper or inadequate ventilation, illumination, noise, presence of toxic gases, fumes, vapours, dust, etc. in the work environment above the threshold limit value (c) internal load comprising emotions, perceptions, anxiety, personal and work related socio-physio problems and (d) situational load comprising of the insecure and dangerous situation made out of a well secured and safe condition. 2. Trap is the inconsistency or incompatibility between the man and his work station, design of tool, design of machine, location and orderliness of the controls, signals etc. 3. Decision to err could be caused because of factors such as (a) conscious decision to err caused due to measures of bosses, pressure, priority of seniors, values etc. (b) The unconscious decision to err could be attributed to the accident prone and mental problems. (c) The low perception of the probability of the occurrence of incident of an accident because of low perceived cost associated with it.

In many economic activities, the above factors play a vital role in causation of the accidents due to political and administrative impediments, technological explosion, lack of technical coordination, financial constraints etc. These impediments may not be totally eliminated with the changing policies

nationally and world over and its impact on the economic activity carried out .

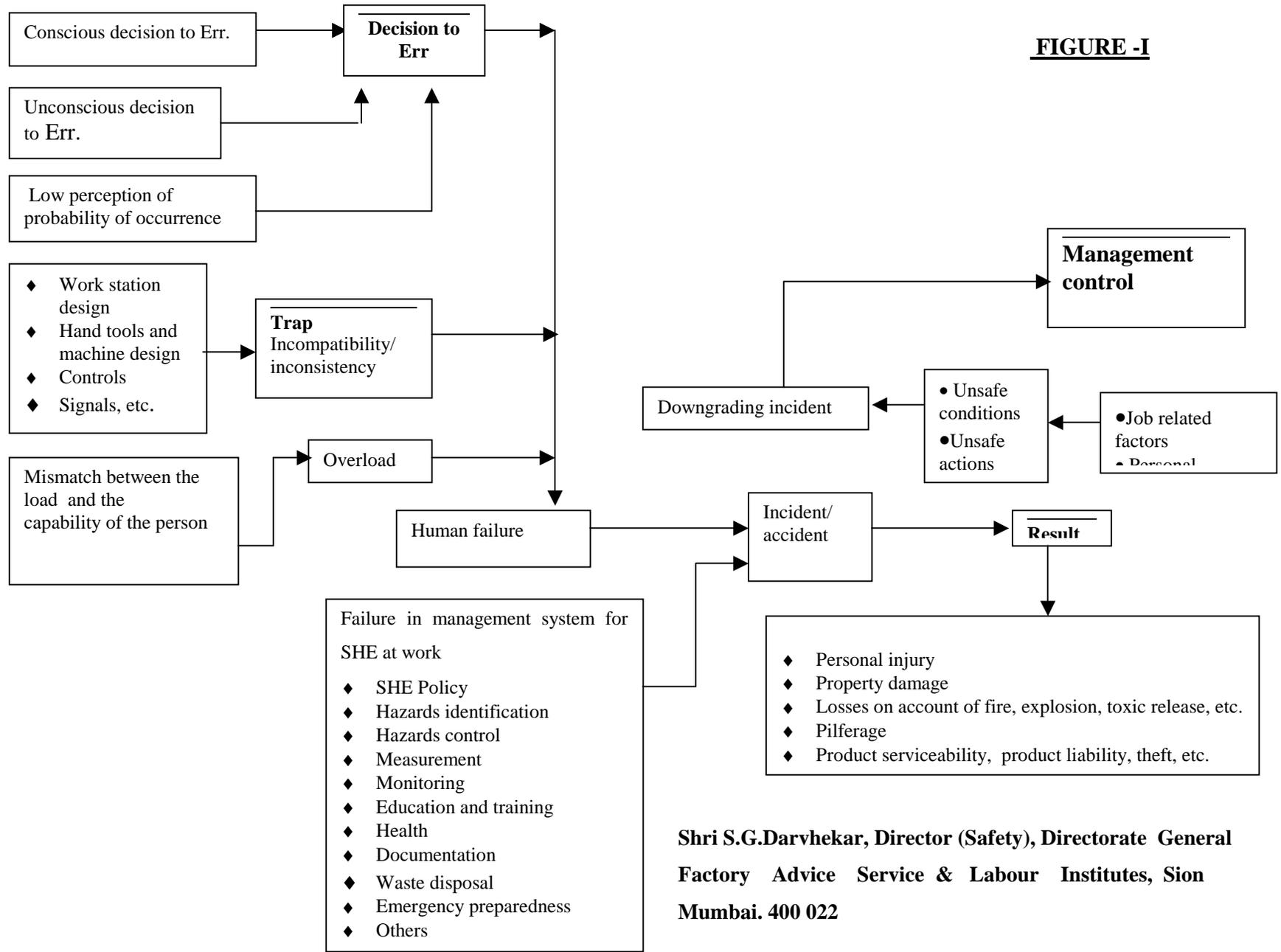
Management of any enterprise needs to have proactive approach for prevention and control of accident rather than reactive approach/ post accident approach. In other words, adequate steps need to be taken to identify the hazards well in time and most pragmatic actions initiated to control the downgrading incidents. The well accepted techniques for identification of hazards as proactive approach include i) HAZOP (ii) Plant Safety Inspection (regular & periodic) iii) well laid down Safe Operating Procedures for shut down and start up operations, iv) Behaviour Sampling v) Failure Mode And Effect Analysis (FMEA), vi) Fault Tree Analysis, etc. However, in the event that any downgrading incidents take place, techniques such as i) Accident Investigation, ii) Job Safety Analysis, iii) Incident Recall Technique, iv) Critical Incidence Techniques, etc. may be employed to identify the immediate and underlying (hidden) causes for such a downgrading incidence.

After having thoroughly identified the possible hazards, most appropriate control/prevention measures need to be implemented.

So far as job related sub-standard conditions are concerned, approaches such as dilution, ventilation (general & local exhaust), surface modification, elimination, substitution, isolation, segregation, enclosure, machine guarding, provisions of PPE (as a final resort mechanism when the other approaches are not possible) need to be implemented. These approaches may be administered either individually or in combination. However, before implementing such an approach/ approaches, one has to assess the possible outcome in totality such as control/prevention of hazards, environmental degradation etc.

Even today, after having provided with ergonomically designed work stations and proper interfacing between man and machine, tool, environment, etc, it has been observed that in industrially developed countries, downgrading incidents continue to occur in the form of substandard human performances. One may attribute several reasons and causes for such complex human interaction. Hence, approaches such as education, training, constant, continuous and competent supervision, persuasion, appeal, personal adjustments, motivation and disciplinary action may be considered for implementation either in isolation or in combination. Most of the enterprises do employ such techniques but with less of conviction for the possible/ expected effectiveness. It would not be out of context to state that all the social partners such as government, workers-organisations and employers' organisations need to continually explore newer techniques and ideas for correcting and controlling the substandard human behaviour.

Human life is precious. Costly machinery equipment, tools, technology, processes, etc. are definitely the assets of the enterprise. Often it has been noticed that these softwares are protected but the costliest asset i.e. the human being who interact with these costly assets is conveniently ignored. Any investment in improving the quality of the precious human resource would generate the best quality results with less of supervision and control. No wonder this may sound little unacceptable, but if it is practiced and implemented in the right earnest and belief, the results would certainly be seen by anyone in days to come.



**Shri S.G.Darvhekar, Director (Safety), Directorate General
Factory Advice Service & Labour Institutes, Sion
Mumbai. 400 022**

PERSONAL PROTECTIVE EQUIPMENT - RESPIRATORY

M.M. ALAM KHAN

It has been observed that exposure to hazardous chemicals in any industrial work place can not be completely eliminated by using various safe technologies and engineering control measures. The workers are, therefore, bound to face some amount of harmful exposures during the course of their work. It has to be kept in mind that there may also be a plant breakdown or sometimes, repairs and maintenance may have to be carried out in the contaminated environment. On such occasion, the level of air contaminants may even exceed the Permissible Limit of Exposure and the working conditions may essentially demand for providing Respiratory Protection devices to the workers. Such exposures are also possible in manual handling and transportation of chemicals. Respiratory protective equipment should be considered as a last resort or as a stand-by protection and never a substitute for effective engineering control measures. It is, therefore, essential that the last line of defence should be most reliable and must not provide a false sense of security to the users. It is a well known fact that the toxic effect of a chemical depends on the nature and degree of its hazard potential. As such, for different work situations, different types of respiratory protection devices are required and used.

Classification of Hazards for Respiratory Protection

The various types of hazards to which a worker is exposed in the industry are the main points of consideration for selection of the right type of respiratory protective equipment. These hazards may be classified as given below.

- 1 Oxygen deficient work environment.

- 2 Gas or vapour Contaminants.
- 3 Air borne particulate matter.
- 4 Mixture of gases, vapours and particulate matter

1. Oxygen deficient work environment.

The presence of inert gases (Nitrogen or Carbon dioxide) in high concentration produces Oxygen Deficient atmosphere. Confined spaces also may have less amount of oxygen than our requirement for breathing purpose. Breathing air with oxygen content of 16% or less may produce symptoms ranging from increased rate of breathing, acceleration of pulse rate, unconsciousness and to death. The flame of a safety lamp, which gets extinguished in such atmosphere, can easily detect such oxygen deficient conditions. The respiratory protective equipment, used in such conditions, should either supply normal fresh air or oxygen to the wearer.

2. Gaseous/ vapour Contaminants

The highly toxic gases or vapours present in breathing air can endanger the life of a person, if exposed, even for a short period of time. High concentration of a gas in the work environment is also immediately dangerous to life. Where it is not possible to determine the extent of concentration or the kind of gas is not known, all gases should be considered as 'immediately dangerous to life' As such, supply of fresh air or self contained breathing apparatus should be used.

The toxic gases or vapours - when they build up a concentration in the work environment exceeding the Permissible Limit of Exposure and it is breathed by a worker repeatedly may cause possible health injury after a prolonged exposure. The exposure concentration of the contaminant should, therefore, be known to

decide when and which type of respiratory protection device is required to be used.

3. Air borne particulate matter (Dusts, Fumes, Smokes, Mists, and Fogs).

The particulate contaminants may be solid, liquid, or a combination of both. These contaminants may be classified into three broad groups.

a) Nuisance Dust.

The particulate matter which remains in the lungs without producing local or systemic poisoning effects or may dissolve and pass directly into the blood stream without causing any harmful effect are called nuisance dust. Examples of such dust are cement, lime and sawdust.

b) Toxic particulate matter.

Air borne particulate matter when inhaled may get trapped into the lungs and subsequently may pass to the blood stream and enter into various parts of the body. The effects may be chemical irritation, systemic poisoning, allergy reaction and cancer. Common contaminants in this group are Antimony, Arsenic, Cadmium, Lead, Manganese, Chromium, Chromate, Dichromate, etc.

c) Fibrogenic Dust

The particulate matter, which has potential to produce fibrosis of the lung tissues is called fibrogenic dust. Examples of such dust are Asbestos, Cotton. Silica powder, etc.

d) Mixture of gases, vapours and particulate matter

The mixture of different types of air borne contaminants like oxides of nitrogen produced by electric arc welding operation and the metal fume generated, as well as the presence of other gases in the work place environment draw special attention for taking a decision in selection of right type of respiratory protection devices. In such situations more effort is required to be made to improve the workplace

environment. Priority is required to be given to eliminate some of the contaminants in the most possible and practicable manner and then subsequently to select the right type of a respirator.

Types of Respiratory Protective Equipment

The Respiratory Personal Protective Equipment can be broadly divided into two groups:

1. Air Supplying Respirators (Breathing Apparatus).
2. Air Purifying Respirators

Respirators of various types used in different work situations are discussed below with their main function, utility and limitations.

Air Supplying Respirators (Breathing Apparatus)

Breathing Apparatus enables a person to work in a poisonous and contaminated environment for a long or a short period with full physical and mental capacity. It is also known as rescue apparatus, anti - gas apparatus and gas mask. Such breathing apparatus is required in mines, gas works, chemical factories, and oil refineries and in confined spaces. It can also be used by fire brigade, municipality, armed forces and mountaineers.

The breathing apparatus should be so efficient and reliable as to ensure the safety of the users in toxic gases, oxygen deficient atmosphere, extreme heat, high humidity, wreckage & fall during disaster. It is therefore, imperative that breathing apparatus should be easy to wear, comfortable to the extent possible, efficient and safe under various conditions including temperature, resistance and have an appropriate design. Good quality of materials and workmanship are the other essential requirements of the breathing equipment. Besides, it should ensure chemical purity of air/oxygen meant for breathing purpose and conform to rigorous physiological, physical, chemical and mechanical tests. Such tests have been prescribed by Bureau of Indian Standard (BIS)

for Breathing Apparatus in IS: 10245 (Part I, II, III, IV) –1982

a) Closed Circuit Breathing Apparatus

The exhaled air is re - breathed by the users in closed circuit type of breathing apparatus. The wearer inhales oxygen through a one-way breathing valve and his exhaled breath passes into a canister containing chemicals to absorb exhaled carbon dioxide and moisture and then through a cooler into the same breathing bag. Oxygen enters the breathing bag from the supply cylinder only when the volume of gas in the bag has decreased sufficiently. The exhaled carbon dioxide concentration is effectively reduced and the oxygen concentration is enriched. It is used either with a full-face piece or with mouth piece and nose clips.

b) Open Circuit Breathing Apparatus

The wearer gets breathing air from compressed air cylinder through a demand valve in an Open Circuit Breathing Apparatus. In a demand type respirator, air is supplied to a face-piece through a demand valve. The rate is governed by his breathing requirement actuated by the creation of slight negative pressure due to inhalation. On exhalation, the demand valve closes and exhaled air escapes to the surrounding atmosphere through exhalation valve. Helmets or hoods are not attached with demand type respirator.

c) Airline Respirator

Airline respirator consists of a face-piece (half or full mask or a loose fitting helmet or hood) to which air is supplied through a small diameter hose. It may be a continuous supply type or a demand type through compressed air pipelines.

In Airline respirators, the length of the air supply hose is so that the air supply is maintained but the wearer's travel movement restricts protection. Care should be taken to ensure that the air supply is always breathable and is not contaminated and free from

objectionable odours, oil mist or water vapour and rust particles from the supply line.

d) Suction Hose Mask

It consists of a full face piece connected to a large diameter flexible hose. The worker draws in air by his own breathing effort. The hose is attached to the wearer's body by a suitable safety harness with safety line and the air inlet end of the hose is provided with a filter to arrest particulate matter. Air can be drawn in by respiratory effort of the wearer up to 30 ft. (9 Metres) length of the hose.

e) Pressure Hose Mask

Pressure hose mask is similar to suction hose mask except that the air is forced through a large diameter hose by a hand or motor – operated blower. The blower is to be operated continuously while the mask is in use.

From respiratory point of view, self-contained breathing apparatus **has no limitation as to the concentration of the gas or deficiency in the surrounding atmosphere** but other factors may limit the time that the wearer can remain in a contaminated atmosphere. Many gases are very irritating to the skin and can be absorbed in dangerous amounts through the skin. As such, in some situations, devices for body protection is also required to be used.

1 Air Purifying Respirators Canister type Respirator (Gas Mask)

The canister type respirator consists of a canister containing appropriate chemical, a full face-piece and body harness to hold the canister attached to the body of the wearer. Air is drawn through the canister by the wearer's normal inhalation force. The contaminated air passes through the canister and the gases or vapours present in the incoming air is adsorbed in the activated charcoal impregnated with suitable chemicals to neutralize and contain the contaminants. The canisters are designed for specific gases and it is very important that only an appropriate type of canister is used for a specific purpose.

The canister gas mask can only be used in atmosphere not deficient in oxygen and not containing more than 2% by volume of most toxic gases. The life of the canister also depends upon the type of canister, the concentration of gas and the activity of the wearer. Similar to canister gas mask, chemical cartridge respirator also provides respiratory protection for a period that depends on the type of cartridge used, the concentration of the gas or vapour and the wearer's activity. Cartridge respirators are recommended for low concentration gases and vapours (maximum of

0.1% of organic vapour). For easy identification of the Canister and Cartridge Respirator, specific colour has been assigned to each type of respirator. IS 8318-1977 mentions about the colour identification markings for canister and cartridges. As per IS 8522-1977, a cartridge respirator should not be used beyond the air borne concentration of a chemical. The maximum use concentration for a cartridge respirator along with the colour codes of few canister / cartridge respirators are given below.

Name of Chemical	Max. Concentration in ppm For use of cartridge respirator	Color code for canister / cartridge
Ammonia	300	Green
Chlorine	10	White
Hydrogen Chloride	50	White
Organic Vapour	1000	Black
Sulphur Dioxide	50	White
Acid gases, Ammonia and Organic Vapours	--	Brown
Acid gases, Ammonia, Carbon monoxide & Organic vapours		Red
Dust, Fume & mists		Orange

a) Self-Rescue type Respirators

The Self Rescue type respirator is designed to provide the greatest possible respiratory protection consistent with the practicability of carrying the device at all times, so that it is always available for use during escape. It consists of a small filter element, a mouth

piece, a nose clip and means for carrying conveniently on the body. The filter elements are similar to chemical cartridges. The extent of protection afforded by self rescue type respirator is between the canister gas mask and the chemical cartridge respirator.

c) Mechanical Filter Type Respirators

Mechanical filter type respirators remove particulate matter from the inspired air by allowing the air to pass through a filter. These filters may be for single use or re-usable type. If these respirators are used in heavy concentration of particulate matter, the filter will be clogged with dust particles too quickly and it may have to be replaced every now and then. Micro filters are special filters designed to arrest fine dust particles of ultra microscopic size.

d) Combination of chemical & mechanical filter Respirators :

These respirators are provided with a mechanical filter and a cartridge for the specific gas or vapour to remove toxic gases and vapours as well as particulate matter from the inspired air. These respirators are used in spray painting work, electric arc welding, powder formulation of pesticides, etc.

Selection of Respirator

Respirators are life saving Personal Protective Equipment and hence due care and attention has to be paid while selecting a right type of respirator in a particular work environment. It is necessary to know the type and nature of the air contaminants, level of air borne concentration, severity of the hazard, period for which respiratory protection is required, location of the contaminated area, availability of the fresh air and expected activity of the wearer. In addition, the operating conditions and limitations of the available respirator are also required to be known. Considering the above factors and keeping in view the safety of the persons at work, suitable and appropriate type of respiratory protection device is selected.

Important points to check the quality of respirators

To select the best quality of the respirator, the following important points are required to be considered.

1. All materials used in the manufacturing and assembly of the respirators should have adequate mechanical strength, durability and resistance to deterioration by heat or by contact with sea water or mine water. It should also be antistatic and resistant to fire.
2. Exposed parts/components of the respirators should not be made of metals like magnesium and aluminum or its alloys to avoid frictional sparks capable of igniting flammable gas mixtures.
3. The parts of the respirators which come in contact with should be non staining, soft, pliable and should not contain known dermatatic substances.
4. The respirator should be sufficiently robust to withstand rough usage.
5. The detachable parts should be well designed for easy detachment, cleaning and securely refitting to its main bodies.
6. Adjustable parts of the breathing apparatus should be readily accessible and easily distinguishable from one another even by touch sensation.
7. Face piece of the respirators should cover the eyes, nose, mouth and chin. It should provide adequate sealing on the face of the users against the outside gas during movement of head, speech communication and dry or moist skin. Face piece is not suitable for a person having beard unless it is so designed. Face piece should be light in weight comfortable to wear. It should have adjustable and replaceable head harness.
8. The nose clips should restrict the entry of air contaminants through

upper sides of the nose. It should be comfortable in use and easy to fit.

9. The inhalation and exhalation valves should not cause the wearer to apply extra pressure for breathing purpose. The inhalation resistance should not be more than 30 mm of water pressure before test and 50 mm of water pressure after test. The exhalation resistance should not exceed 20 mm of water pressure.

10. Representative samples of the various types of respirators should be tested to ascertain their quality that they conform to the specifications of BIS. A few important specifications required to be considered are mentioned below:

- a) The quality of the breathing air supplied to the user must conform to BS:4274 British Standard and IS:10245 – 1982. Breathing air should not contain more than 0.5 mg/M³ of particulate matter, 500 ppm of carbon dioxide and 5 ppm of carbon monoxide.
- b) Breathing resistance must be within specified limits.
- c) Life and efficiency of the sorbent of canister/cartridge against the specific gas or vapours should be more or equal to the specified period under different test conditions.
- d) valves leakage should not exceed the specified limits.
- e) Face piece fitness test should conform to the requirements.

f) Filtration efficiency of the dust mask should be more than 98.5 % for the particles of the size of 0.4-0.6 µm .

11. The performance of the respirators are ascertained by subjecting it to the various tests in a simulated condition as per the specifications of BIS. Such test facilities are available in Central Labour Institute, Mumbai, which are utilised by the manufacturers and user industries. Bureau of Indian Standard also sends samples to this laboratory for ascertaining the quality before certifying any respirator with ISI Marks.

12. Breathing apparatus should be safely kept in a separate bag or container to avoid contamination from the work place atmosphere.

Care and effective use of respirators

Respirators and breathing apparatus should be carefully maintained to retain their original efficiency. For this purpose, a few of the points are required to be taken into account, which are given below:

- a) System for periodic inspection and maintenance with recording.
- b) Inspection, maintenance and recording every time after use.
- c) Cleaning and disinfecting as recommended by the manufacturers.
- d) If possible, respirators may be issued to individuals.

- e) The filters of the dust respirators are required to be cleaned or replaced, if pores are clogged.
- f) Users must be trained before they are asked to wear breathing apparatus or respirators.
- g) Periodic drills for the use of breathing apparatus may be arranged.

References:

- 1) IS: 8522 - 1977 Specification for Respirators, Chemical Cartridge.
- 2) IS: 8523 - 1977 Specification for Respirators, Canister Type (Gas Mask).
- 3) IS: 8318 - 1977 Colour Identification Markings for Air – purifying Canister and Cartridges.
- 4) IS: 10245-1982 Specification for Breathing Apparatus (Part I, II, III & IV).
- 5) IS: 9563 - 1980 Specification for Carbon monoxide Filter, Self Rescuer.
- 6) IS: 9473 - 1980 Specification for Filter- Type Particulate Matter Respirators.

Shri M.M. Alam Khan, Director
(Industrial Hygiene), Central Labour
Institute, (DGFASLI) Sion,
Mumbai.400022

HAZARD AND OPERABILITY (HAZOP) STUDY OF ILMENITE BENEFICIATION PLANT & ACID REGENERATION PLANT

This HAZOP study was conducted by Central Labour Institute, Mumbai in a Ilmenite Beneficiation Plant & Acid Regeneration Plant of Minerals & Metals Co.Ltd in Kerala to identify possible deviations in the intended design and operational procedures which could lead to significant hazards.

METHODOLOGY

The team of officers examined critically the Piping & Instrumentation Diagram's (P&I D) of plant sections of IBP and ARP and studied the operation methods to identify possible deviations in the intended design and operational procedures which could lead to significant hazards. Recommended actions to obviate the hazards were also discussed during examination sessions.

OBSERVATIONS

It was observed that the unit had made certain changes/modifications of the original designs in some plant sections either for solving the operability problems or ease of operations but the changes were not incorporated in the respective P & I D's. Some of the important recommendations are given below:

RECOMMENDATIONS

- Low amperage alarm should be provided to detect less load on roaster.
- The rupture disc provided on cyclone connected to roaster should be tested periodically for its reliability as failure of rupture disc may cause over pressurization of roaster leading to leakage of flammable/toxic gases.
- R.P.M. monitoring of roaster should be done at an interval and records maintained.
- High temperature alarm should be provided at the discharge side of the roaster.
- Low pressure alarm should be installed to warn about drop in pressure in the roaster.
- A low water flow alarm to the cooler may be installed. At present only water flow indication is available.
- Pipelines connected to roaster and cooler and cyclone should be periodically tested for leaks.
- **Operators including maintenance staff working on acid lines should be provided with full body protection suits.**
- A high level alarm with trip to acid transfer pump should be provided to the digester.
- A study should be conducted to assess the level of pollution of the workplace as well as at the outlet of stack during power failure conditions.
- Zero speed switch should be provided to all the conveyor belt to detect the movement of conveyor belt.
- Roaster exhaust gases should be monitored for CO concentration by installing on-line CO monitor.

- The hose connected to the spray boom should be inspected/maintained and replaced periodically.
- To prevent air pollution the roaster vent should be connected to a scrubber system .
- Emergency power supply should be provided to the scrubber system to control air pollution.
- An arrangement to keep the LPG line in hot condition may be made to avoid condemnation.

SAFETY AUDIT IN A CHEMICAL INDUSTRY

This Safety Audit was undertaken by Central Labour Institute in a chemical industry in the State of Maharashtra with an objective to critically examine the OSH system company and suggest improvement wherever needed.

MANUFACTURING PROCESS

The company manufactures a wide range of chemicals like Dimethyl Amino Ethanol, Dimethyl Acetamide, Diethyl Amino Ethanol., Ethylene Chlorohydrin, Dimethyl Amine Hydrochloride, Di-isopropyl Amino Ethanol,. Diethyl Amino Ethoxy Ethanol, Piperdinol and Metaformin Hydrochloride.

OBSERVATION

The total storage capacity for inflammable gases/liquids was more than the threshold quantity given in column 3 of part 1 of schedule 3 of the Manufacture Storage and Import of Hazardous Chemical (Amendment) Rules, 2000. Based on critical examination of OSH system and observations made during the study, a number of recommendations were given to improve the system, wherever needed.

RECOMMENDATIONS

- The OSH Policy of the company should be reviewed and modified to contain all the points mentioned in Rule 73-L (4) & (5) of the Maharashtra Factories Rule, 1963.
- Workers representatives of the Safety Committee should be made aware of
- their right and duties as a safety committee member. The Safety Committee should be reconstituted as per norms of Maharashtra Factories Rule, 1963.
- Non-reportable and near miss accidents should be reported, investigated and recorded to avoid recurrence of the same. Accident statistics should be displayed at a conspicuous place.
- Plant-wise safety inspection should be carried out regularly. The format for unsafe act/action and format for plant-wise checklists should be developed.
- The new employee should be given induction training at the time of joining. Infrastructure to impart training such as OHP, TV, VCR, etc., to be provided to safety department.
- Occupational health center should be spacious and kept in hygienic condition. Medical examination of workers should be carried out once in six months.
- Flame proof electrical fittings at Ethoxylation plant stairways should be provided. Gas detector to be provided at EO and DMA storage area and alarm to be provided at main gate and control room.

- The work permit system should be developed covering all the aspects of safety and that system should be followed.
- Acid/alkali kit should be procured. The use of specific PPE for specific operation should be incorporated in SOP for different plants. Responsibility for inspection and maintenance of PPE should be fixed.

A fatal accident occurred in a Port, wherein a cleaner of a tipper lorry, engaged in transportation of coke fell from the same and was run over by the lorry and died. The investigation of the accident revealed that the victim had gone on top of the cargo to cover the same with a tarpaulin and he might have fallen off from the same while the lorry was in motion. The driver of the lorry was found to be negligent, namely, failure to ensure that the victim had not resumed his seat in the cabin, before moving the vehicle. It was also found that the driver might have been deployed on continuous shifts by his employer, leading to fatigue.

The driver of the tipper lorry has been warned for the breach of Section 11(1)(b) of the Dock Workers (Safety, Health & Welfare) Regulations, 1990, for his failure to ensure safety of the cleaner. The company has been warned for breach of Regulation 117 of the Dock Workers (Safety, Health & Welfare) Regulations, 1990, for employing the driver of the tipper lorry on continuous shifts which endangered the safety of the cleaner leading to his death.

A female worker engaged in sweeping coal spillages lying on the road was fatally run over by a mobile crane belonging to one construction company of a Port. The investigation of the accident revealed that the driver of the mobile crane was negligent and failed to observe the victim who was working on the edge of the road, leading to this fatal accident.

The operator of the mobile crane belonging to the company has been warned for breach of Section 11(1)(b) for operating the Mobile Crane in a negligent manner resulting in the death of the dock worker. The Port Trust has been advised to take effective steps to improve

upon the road management with respect to movement of trucks, schedules of clearing of spillages and appropriate location for stack yard, storing bulk cargo such as coal, fertilizers etc. so as to reduce the dust hazard by limiting the road movement from berths to stack yards.

A cleaner of a tipper lorry while crossing the road was hit by another tipper lorry and sustained fatal injuries. The investigation of the accident revealed that the negligence on the part of the victim itself was the cause for this fatal accident. The employer of the deceased has been advised to caution their cleaners to exhibit sufficient vigilance and remain alert in the discharge of their duties to prevent occurrence of this type. The owner of the tipper lorry which caused the fatal accident was advised to instruct all their drivers to avoid over speeding and strictly follow the speed limit restrictions prescribed for dock operations.

A Technician while attending to repair work in the wagon tippler of the ore handling plant, namely, "setting right the break jam" condition of a wagon, received head injury and later succumbed to his injuries at the hospital. The investigation of the accident revealed that work methods on the part of the Port Trust and the failure of the victim to wear helmet were found to be the cause for this accident.

The Port Trust has been advised to adopt a foolproof arrangement of brake release before the wagon is placed on the tippler table for tipping. They have also advised to improve, (a) the supervision with regard to the use of personal protective equipment by the employees (b) repair/rectification work carried out by personnel in confined areas.

TRAINING PROGRAMME ON “IDENTIFYING, RESOLVING STRESS & TRAUMA IN MANUAL MATERIAL HANDLING – AN ERGONOMICS APPROACH”

PROGRAMME PERSPECTIVE

Manual material handling is an old age operation human beings are practicing in shop floor. Prolonged use of physiological systems usually develops stress, strain and trauma in the long run. The main cause of stress and trauma in physiological system is manual material handling. The exact causes of physiological exhaustion and their actual remedial measures are the prime concern of accidents, low productivity and ill health of industrial workers. The primary concern of physiological knowledge is required to improve the capability of workers, supervisory skill, reduce accidents rate, and to increase productivity without causing ill effects on their health. The actual physiological capabilities of workers are compared with that of their job demand to match their performance.

The concept of human biomechanics is another area, which has the specific knowledge of handling of material based on actual physiologically economical posture. Thus, the knowledge of biomechanics and anthropometry will be the key factors in reducing musculoskeletal disorders, stress, strains, trauma and fatigue in industrial processes. Keeping this in mind this five days training programme is designed for imparting the knowledge of Physiology and Biomechanics in understanding the development of stress, strain & trauma, musculoskeletal disorders, and the remedial measures to be followed. This programme is for all those who are concerned with manual material handling operations in industry.

OBJECTIVE

To familiarize with:

- Human physiological capacities

- The job demands based on actual human physiological reaction.
- Management of fatigue, Stress and other strains in Shop floor.

HIGHLIGHTS

- MMH & excessive fatigue
- Diagnosis, resolving of trauma
- Cause effect relationship of fatigue
- MMH & musculoskeletal disorders.

TECHNIQUES

- Discussion based on shop floor experience and case studies.
- Laboratory exercise/demonstration and exhibits.
- Technical films.

PARTICIPANTS

Industrial and Production Engineers, Plant Medical Officers, Dentists, Laboratory Technicians, Safety professionals, Sanitary Engineers, Managers, State & Central transport personnel, shop floor supervisors, Audiologists, Physical & Occupational Therapists, Physiotherapists, Academicians, ESIC & CGHS doctors, Inspectors of Factories and all Safety, Health and Productivity professionals.

FACULTY

Experts from the Central Labour Institute, Mumbai and a few guest speakers who have specialized knowledge and experience in the respective fields.

DURATION: 5 DAYS

Conducted by:
Industrial Physiology Division,
Central Labour Institute, Sion,
Mumbai.400022

INTERNATIONAL OCCUPATIONAL SAFETY AND HEALTH INFORMATION CENTRE (CIS)

CIS (from the French name, Centre international d'Information de securite et d'hygiene du travail) i.e. International Occupational Safety and Health Information Centre, is a part of the International Labour Office, Geneva, Switzerland. The mission of CIS is to collect world literature that can contribute to the prevention of occupational hazards and to disseminate this information at an international level. CIS imparts to its users the most comprehensive and up-to-date information in the field of Occupational safety and health. The work of CIS is supported by a worldwide Safety and Health information exchange network which includes over 91 affiliated National Centres and 38 CIS collaborating Centres. Central Labour Institute, Mumbai has been designated as the CIS National Centre of India.

CIS can offer you rapid access to comprehensive information on occupational safety and health through:

- Microfiches on original documents abstracted in CIS DOC (CISILO)
- ILO CIS Bulletin "Safety and Health at Work"
- Annual and 5-year indexes
- The CIS Thesaurus
- The list of periodicals abstracted by CIS

EXCERPT FROM CIS DOC

Title: Occupational exposure to alkoxysilanes in a fibreglass manufacturing plant.

CIS ACCESSION NUMBER

CIS 00-1661

ABSTRACT

To assess the exposure of workers to alkoxysilanes and to determine the main route of exposure during the manufacture of fibreglass, samples were taken from workers and their environment. The silane concentrations in the air samples were below the detection limit of the analytical methods used. The mean dermal exposure to 3-glycidoxypropyltrimethoxysilane was analysed from cellulose patch samples as well as in handwash samples. The results showed that the workers were clearly exposed to silanes. The main route of potential exposure was through the skin, especially the hands, which emphasized the importance of wearing appropriate protective gloves. According to patch sampling, on average two thirds of the cases of total dermal exposure were caused by exposure of the forearm, as indicated by the amounts of silanes analysed in the forearm patches. Since almost every worker wore protective gloves, the main cause of exposure to silanes was from the wearing short sleeved T-shirts which did not provide any protection to the arms.

Note:

For details write to CIS National Centre for India, Central Labour Institute, Sion, Mumbai 400 022.

The Library & Information Centre of Central Labour Institute has unique collection of Material Safety Data Sheet of about 1,20,000 chemicals/materials taken from Canadian Centre for Occupational Health & Safety. MSDS provides extensive coverage over safety perspective with detailed evaluation of health, fire and reactivity hazards. It also provides precaution as well as recommendation on handling, storage, personal protective equipment, accidental release etc.

Product name(s) : Concentrated Nitric Acid

ACUTE HEALTH HAZARDS:

EYE CONTACT: May cause severe burns with corneal ulceration and possible blindness.

SKIN CONTACT: May cause severe burns with necrosis and scarring.

INHALATION: May cause irritation of the nose, throat and respiratory tract.

High concentrations may produce bloody nasal secretions and pulmonary edema.

INGESTION: May cause burns to the gastrointestinal tract, nausea, vomiting, diarrhea and may be fatal.

CHRONIC HEALTH EFFECTS: Repeated exposure to the mist may cause inflammation of the upper respiratory tract and etching of the dental enamel.

CARCINOGEN STATUS: This material is not listed as a carcinogen or suspect carcinogen by IARC, NTP or OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with pre-existing respiratory disorders may be at increased risk from exposure.

FIRST AID

EYE CONTACT: Flush thoroughly with copious amounts of running water for 20 minutes, lifting the lids occasionally. Get immediate medical attention.

SKIN CONTACT: Flush thoroughly with water for 20 minutes. Remove contaminated clothing and launder before re-use. Get medical attention.

INHALATION: Remove victim to fresh air and give artificial respiration if needed. Get immediate medical attention.

INGESTION: Never give anything by mouth to an unconscious or convulsing person. Immediately give the victim one to two glasses of water or milk to drink. Do not induce vomiting. Get immediate medical attention.

FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA: This material is not combustible. Use any media that is appropriate for the surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: Firefighters should wear NIOSH approved positive pressure self contained breathing apparatus and full protective clothing. Use water to keep exposed containers cool.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizer! Contact with other materials, especially flammables and combustibles may cause fire or explosion. Greatly accelerates the rate of burning in other materials. Reacts with metals to form flammable hydrogen gas.

HAZARDOUS COMBUSTION PRODUCTS: Oxides of nitrogen.

HANDLING AND STORAGE

WORK PRACTICES: Prevent contact with the eyes, skin & clothing. Wear recommended protective clothing. Wash thoroughly after handling. Do not eat, drink or smoke in the work area. When diluting, always add acid to water while stirring. Never add water to acid.

SPECIAL PRECAUTIONS: Oxidizer! Keep away from flammables and other oxidizable materials. Keep containers closed when not in use. Empty containers retain residues and may be hazardous-follow all precautions when handling.

STORAGE: Store in a well ventilated area, away from alkalis, flammables and combustibles. Keep container tightly closed. Do not store on wooden floors.

PERSONAL PROTECTION

GLOVES: Impervious such as rubber or neoprene.

EYE PROTECTION: Chemical safety goggles and face shield recommended. Do not wear contact lenses.

OTHER PROTECTIVE EQUIPMENT: Protective apron or coveralls. Safety shower and eye wash in the work area.

STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: Avoid excessive heat.

INCOMPATIBILITY: Alkalis, oxidizable materials, flammable and combustible materials, metals, reducing agents, amines, alcohols. Avoid all materials whose compatibility has not been established.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may release toxic oxides of nitrogen.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: N/A

TOXICOLOGICAL INFORMATION

ACUTE TOXICITY DATA: The LC50 is reported to be 244 ppm/30 min. in rats.

IRRITANCY DATA: This material is corrosive to all tissues.

SENSITIZATION: This material has not been reported to cause sensitization in animals or humans.

REPRODUCTIVE TOXICITY: This material has not been reported to cause reproductive toxicity in laboratory animals or humans.

TERATOGENICITY: This material not been reported to cause teratogenic effects in laboratory animals or humans.

MUTAGENICITY: This product has not been found to be mutagenic.

SYNERGISTIC EFFECTS: There are no chemicals known to cause any additive adverse health effects.

DISPOSAL

Dispose in accordance with all local, state and federal regulations.

RCRA HAZARDOUS WASTE CODES: D002

TRANSPORTATION DATA

US DOT SHIPPING NAME: NITRIC ACID SOLUTION (69-71% NITRIC ACID), 8, UN 2031, PG I

DOT LABELS REQUIRED: OXIDIZER AND CORROSIVE EMERGENCY RESPONSE GUIDE NUMBER: 157

IATA SHIPPING NAME: NITRIC ACID SOLUTION, 8, UN 2031, PG I

IATA LABELS REQUIRED: OXIDIZER AND CORROSIVE (CARGO AIRCRAFT ONLY, UP TO 2.5 LITERS)

OTHER REGULATORY INFORMATION

SARA 311/312: Hazard Categories for SARA Section 311/312 Reporting: Acute health, chronic health, fire hazard.

SARA 313: This product contains the following chemicals subject to Annual Release Reporting Requirements under SARA Section 313 (40 CFR 372): Nitric acid 69-71%

CERCLA SECTION 103 REPORTABLE QUANTITY: Product - 1408 lbs. (Nitric Acid -1000 lbs)

CALIFORNIA PROPOSITION 65: This product contains the following substances known to the State of California to cause Cancer and/or Reproductive Harm:

None

US TOXIC SUBSTANCES CONTROL ACT: All of the components of this product are listed on the EPA TSCA Inventory.

NOTE: The above details constitute part information of MSDS taken from Canadian Centre for Occupational Health and Safety. For complete MSDS write to MIS division, Central Labour Institute, Sion, Mumbai.400022. MSDS on about 1,00,000 chemicals/materials are available with Central Labour Institute. Computer printout will be supplied on nominal charge basis.

LIBRARY AND INFORMATION CENTRE

The Library-cum-Information Centre of Central Labour Institute has unique and rare collection of different kind of publications in the field of Occupational Safety, Health, Management and allied subjects. It also has a good collection of different standards, codes, regulations on these matters. In the current year the centre is subscribing to 25 Indian & foreign journals, besides receiving complimentary copies of different periodicals from all over the world. The centre provides facilities for study and research and at the same time supplies authentic and up-to-date information on Occupational Safety, Health and Management. It also extends reading facilities to students & scholars attending different training programmes & courses conducted by CLI. From January 2001 till date a number of publications in the field of OS&H have been added to Library. Some of them are :

ELECTRONIC LIBRARIES

Author: V.C. Malavya

**Publisher: Ess Ess Publications,
New Delhi**

The use of computers has been steadily increasing in Science and Technology since the Second World War. India has just made a start, especially in industry and business. Libraries are no exception to them. As the Library authorities and librarians are becoming aware of their potential uses, these are being put to more use. So much so that not only some courses in computer applications are being arranged regularly by the private sector, but they are finding their pride place in Library science courses also. There have been very rapid changes in computer technology. The developments will have immense impact on the storage and retrieval of information in Libraries. It is hoped that by turn of the century, India might have taken many leaps towards computerisation of library operations, there is now extra need to train such manpower which would be capable of handling

computer systems for information processing and management.

BIOLOGICAL MONITORING TECHNIQUES FOR HUMAN EXPOSTURE TO INDUSTRIAL CHEMICALS

**Authors: I.Sheldon,M.Umana,J.Burse,
W.Gutknecht, R.Handy, P.Hyldburg,
L.Michael, A.Moseley, J.Raymer,
D.Smith,C.Saparacino, M.Warner
Publisher: Noyes Publications, USA**

Biological monitoring techniques for human exposure to industrial chemicals are detailed in this book which surveys and evaluates methods and procedures to identify and quantitate chemical constituents in human tissues and body fluids, including fat, skin, nails, hair, blood, urine, and breath. The book details attempts to determine the feasibility of correlating preferred methods with specific tissues or fluids and/or with readily identifiable chemical characteristics, and which biological matrices serve as the best indicators of past or present exposure to chemical constituents of concern.

The methods studied have been evaluated for their ease and rapidity, as well as cost, accuracy, and precision. Target compounds studied were those inorganic and organic chemicals basically of current or previous concern to the U.S. Environmental Protection Agency. This is a basic guidebook for the analysis of chemical compounds in specific body tissues and fluids.

Information provided for the methods evaluated includes sections on various types of instrumentation and sample preparation. The section on method/analyte correlation suggests physical or chemical properties which might be used to predict the applicability of a given analytical method to the analysis of that chemical in a specific biological matrix.

MINISTRY OF LABOUR, GOVT.OF INDIA – MAJOR ACHIEVEMENTS & INITIATIVES DURING THE LAST TWO YEARS.

SOCIAL SECURITY

- Arrangements have been made for the first time for disbursement of Pension through 26,000 Post Offices across the country under the Employees' Pension Scheme.
 - Additional relief of 9.5% given to 10 lakh pensioners over the last two years.
 - Special drive launched and 54,983 establishments brought under the compliance fold and 54,51,436 deprived workers extended the Provident Fund benefits.
 - Additionally, 23,639 new establishments were brought under the fold of the Act and 44.39 lakh workers enrolled to the Fund membership.
 - The number of subscribers have increased to 2.59 crore. EPF is targeting to bring 5 crore subscribers under the ambit of the Scheme in the near future.
 - Regional Offices of EPFO in the State of Uttaranchal, Jharkhand, Chhattisgarh and Goa, have been set up.
 - The Employees' Provident Fund (EPF) ceiling limit enhanced from Rs.5,000/- to Rs.6,500/-.
 - Minimum amount of compensation under the Workmen's Compensation Act raised from Rs.50,000/- to Rs.60,000/- in case of death and from Rs.60,000/- to Rs.90,000/- in case of permanent total disablement.
- Employees State Insurance (ESI) Scheme has been implemented in 125 new geographical areas in 9 States benefiting about 2.40 lakh additional employees.
 - ESIC has exempted insured persons earning upto Rs.40/- a day from the payment of employees contribution w.e.f. April, 2001. Over six lakh workers would benefit from this.
 - Dependent and disability benefits under ESI Scheme increased ranging from 14% to 23.59%.
 - ESIC has raised the limit of payment on account of funeral expenses in case of death of an insured person from the existing Rs.1500/- to Rs.2500/- w.e.f. 01.10.2000.
 - ESIC has decided to upgrade one hospital into a model hospital in each State with State of Art medical facilities.
 - The ESIC has introduced family photo identity cards in respect of insured persons from April this year in order to contain the misuse of the medical facilities under the ESIC Scheme.

WAGES

- The minimum rates of wages per day in the employment of agriculture hiked in the range of Rs.67/-to Rs.101/- w.e.f. 11.11.1999 as compared to earlier range of Rs.26 to Rs.58.
- The floor level minimum wage increased from Rs.40/- per day to Rs.45/- per day w.e.f. 30.11.1999.

AWARDS PRESENTATION FUNCTION

The Awards presentation function for “Vishwakarma Rashtriya Puraskar” & “National Safety Awards” for the year 1999 was held on 17th September, 2001 at Vigyan Bhavan, New Delhi. Shri Vinod Vaish, IAS, Secretary to the Government of India, Ministry of Labour welcomed the Awardees and guests and briefed them about the Vishwakarma Rashtriya Puraskar (VRP) and the National Safety Awards (NSA) schemes. He appealed to all the concerned to come forward in larger number to participate in the Award Schemes so as to bring about greater awareness of the need for all round improvement in our efforts to produce quality goods and services in safe and healthy conditions and to fully involve the working class in an efficient and effective manner.

The Hon’ble Union Minister of State for Labour & Employment, Shri Muni Lallji delivered the presidential speech and appreciated the contribution made by the Awardees. He stressed that the responsibility for ensuring safety of the workers, conservation of the environment etc. involved in the production of goods and services should not be the concern of the Government alone but should be shared equally by all as partners in development.

The Hon’ble Union Minister of Labour, Shri Sharad Yadavji, in his speech, congratulated the Awardees for their excellent work done in the field of Safety, Health & Environment. He felt that there is need to lift the quality of work life of the working class to integrate our national economy with global economy.

Awards were presented by Hon’ble Union Minister of Labour Sharad Yadavji and Hon’ble Minister for State for Labour & Employment Shri Muni Lallji and vote of

thanks was proposed by Shri S. K. Saxena, Director General, Factory Advice Service & Labour Institutes, Mumbai. 79 awards of Vishwakarma Rashtriya Puraskar and 68 of National Safety Awards were received by the Awardees.

ILO/DGFASLI WORKSHOP

A four day ILO/DGFASLI Workshop on “Safety, Health & Environment – Priority Concern for Workers Representatives in Port Sector” was organized and conducted by the Dock Safety Division at DGFASLI in collaboration with ILO, New Delhi from 24-27 September, 2001. This Workshop was inaugurated by Shri D.P.A. Naidu, Senior Specialist on worker activity, ILO, New Delhi. Twenty three delegates representing 5 National Federations namely INTUC, HMS, BMS, CITU & AITUC attended the Workshop. As a part of this workshop, the delegates prepared the action plan for improving safety & health standards at National and Port level.

WORKSHOP ON REVIEWING THE PROVISIONS OF THE FACTORIES ACT

The DGFASLI along with the National Commission on Labour organized a one day Workshop on 21st September, 2001 to review the provisions of the Factories Act 1948 in the changing scenario. Fifty six participants, from various specialities were drawn representing (i) Inspectorate of Factories, (ii) Safety Experts, (iii) Legal Experts, (iv) NGOs & Autonomous Bodies, (v) Employers Organisations and (vi) Employees Organisations. The six groups deliberated for the whole day and made recommendations through presentations which have been taken up for consideration. Two senior experts also expressed their views during the concluding session. The Officials of Ministry of Labour, DGFASLI and National Commission on Labour were also present.

**TRAINING PROGRAMMES
JANUARY TO MARCH 2002
CENTRAL LABOUR INSTITUTE ,SION, MUMBAI**

Programme title	Contact person
Diploma in Industrial Safety	Director (Safety) & Incharge Indl.Safety Division
Quality & Productivity Improvement through Employee Empowerment	Director (Productivity) & Incharge Productivity Division
Training programme on Industrial Safety for National Safety Council- Maharashtra Chapter	Director (Safety) & Incharge Indl.Safety Division
Evaluation & Control of Hazards in Chemical Industry	Director (Indl.Hygiene) & Incharge Ind.Hygiene Division
Workshop on Safety Audit	Director (Safety) & Incharge Indl.Safety Division
Industrial Fatigue- Its Evaluation, Control & Management for Safety, Health & Productivity	Director (Physiology) & Incharge Indl.Physiology Division
Basic Course for Inspectors of Factories	Director (Safety) & Incharge Indl.Safety Division
Participative Approach for Safety & Health	Director (Indl.Psychology) & Incharge Indl.Psychology Division
Occupational Physiology- Its Application in Industry for Promotion of Safety, Health & Productivity at Work.	Director (Physiology) & Incharge Indl.Physiology Division
Advanced Training Programme On Occupational Health & Environmental Medicine for Teachers from Medical Colleges	Director (Medical) & Incharge Indl.Medicine Division

Programme title	Contact person
Managing Stress at Work	Director (Incl.Psychology) & Incharge Incl.Psychology Division
Training Programme on Techniques of Hazards Assessment & its Controls in Major Accident Hazard Installations	Director (Incl.Hygiene) & Incharge Major Accident Hazard Control Advisory Division
Evaluation & Control of Hazards in Pesticide Industry	Director (Incl.Hygiene) & Incharge Incl.Hygiene Division
Training Programme on Safety, Health & Environment at Work Place	Director (Safety) & Incharge Incl. Safety Division
Personal Growth & Group Dynamics	Director (Staff Trg.) & Incharge Staff Training Division
Industrial Fatigue- Its Evaluation, Control Management for Promotion of Safety, Health & Productivity at Work	Director (Physiology) & Incharge Incl.Physiology Division
Industrial Heat	Director (Physiology) & Incharge Incl. Ergonomics Division
Training Programme on Safety in Material Handling	Director (Safety) & Incharge Incl.Safety Division

TRAINING PROGRAMMES
JANUARY TO MARCH 2002
REGIONAL LABOUR INSTITUTE ,LAKE TOWN , KOLKATA.700 089

Programme title	Contact person
Safety, Health and Environment at Work Place	Director (Safety) & Incharge Regional Labour Institute Kolkata
Higher Productivity and Better Place to Work	Director (Safety) & Incharge Regional Labour Institute Kolkata
Chemical Safety for Worker Members of Safety Committee	Director (Safety & Incharge Regional Labour Institute Kolkata
Advanced training Programme on Environmental Hazards and their Control in Industries	Director (Safety) & Incharge Regional Labour Institute Kolkata

TRAINING PROGRAMMES
JANUARY TO MARCH 2002
REGIONAL LABOUR INSTITUTE , CHENNAI

Programme title	Contact person
Workshop on HAZOP	Director (Safety) & Incharge Regional Labour Institute Chennai
Training programme on Management of Hazardous Substances	Director(Safety & Incharge Regional Labour Institute Chennai
Training programme on Occupational Safety & Health in Asbestos Industries	Director (Safety) & Incharge Regional Labour Institute Chennai

TRAINING PROGRAMMES
REGIONAL LABOUR INSTITUTE
S.C.F-46, SECTOR 19, PART-II MARKET, FARIDABAD 12102
JANUARY TO DECEMBER 2002(TENTATIVE)

Programme title	Contact person
Training programme on Effective Supervision in Managing Safety, Health & Better Environment	Deputy Director (Staff Trg./Prod)
Training programme on Team Building for Safety, Health and Welfare	Deputy Director (Staff Trg./Prod)
Training programme on Personal Growth and Group Dynamics	Deputy Director (Staff Trg./Prod)

INDOSHNET

Ministry of Labour, Government of India, is developing a National Network on Occupational Safety and Health information system known as INDOSHNET. Directorate General Factory Advice Service & Labour Institutes (DGFASLI), an attached office of the Ministry of Labour will act as a facilitator of the network system. The objective of the network is reinforcement and sharing of national occupational safety and health (OS &H) information on no-profit no-loss basis with a view to pooling our information resources for mutual benefit. The sharing of information will not only confine to the national level but also includes international sources. The communication of information will be through E-mail as well as postal/courier service. DGFASLI invites industrial organisations, institutions, industry associations, trade unions, professional bodies and non-governmental organisations having information on OS&H and willing to share the same with others at the national and international level to participate as members in the network. Interested agencies may please write for proforma of organisational profile to Director General, DGFASLI, Central Labour Institute Bldg., N.S. Mankikar Marg, Sion, Mumbai 400 022.

Note: Those who have responded to our earlier communication and sent organisation profile in the prescribed format need not write again.

NATIONAL REFERRAL DIAGNOSTIC CENTRE

Early detection and diagnosis of occupational health disorders and occupational diseases is one of the most important factors in the prevention and control of adverse health effects on workers due to various factors - physical, chemical, biological and psycho-social. The Industrial Medicine Division of Central Labour Institute, Mumbai runs a National Referral Diagnostic Centre (N.R.D.C.) for early detection and diagnosis of occupational diseases and recommends necessary measures for prevention/control of occupational health problems/occupational diseases. The diagnostic centre is well equipped for medical examination of the exposed workers and facilities are available for carrying out special investigation, e.g. Pulmonary function tests, Audiometry, ECG, Titmus vision test, Biological monitoring, etc. Medical professionals including Factory Medical Officers, ESI Doctors, Medical Inspectors of Factories and Certifying Surgeons, Doctors from Medical Colleges and Hospitals can refer suspected cases of occupational diseases to N.R.D.C. for diagnosis and advice. The communication should be addressed to the Director General, DGFASLI, Central Labour Institute Bldg., N.S. Mankikar Marg, Sion, Mumbai 400 022 for further details.

INOSHNEWS is a quarterly newsletter that facilitates exchange of ideas and data developed through research, study and surveys in the areas of occupational safety and health. DGFASLI invites articles from individuals, industry, industrial associations, trade unions, professional bodies etc. having information on OS & H and willing to share the same with others at the national and international level.

- 1. Manuscripts for publication should be typed in double space within 3 to 4 A4 size sheets only on one side of the paper and sent in duplicate to the Editor-in-Chief. No photographs can be published.**
- 2. Once the manuscripts are accepted for publication, publisher reserves the right to make editorial changes as may be necessary to make the article suitable for publication; and publisher reserves the right not to proceed with publication for whatever reason.**
- 3. Authors should take care to ensure the accuracy of data and reference.**

**GOVERNMENT OF INDIA, MINISTRY OF LABOUR
DIRECTORATE GENERAL FACTORY ADVICE SERVICE & LABOUR
INSTITUTES**

The Directorate General Factory Advice Service & Labour Institutes (DGFASLI) is an attached office of the Ministry of Labour, Government of India. DGFASLI organisation was set up in 1945 under the Ministry of Labour, Government of India to serve as a technical arm to assist the Ministry in formulating national policies on occupational safety and health in factories and docks and to advise State Governments and factories on matters concerning safety, health, efficiency and well-being of the persons at workplace. It also enforces safety and health statutes in major ports of the country.

The Directorate General Factory Advice Service & Labour Institutes (DGFASLI) comprises:

- * Headquarters situated in Mumbai
- * Central Labour Institute in Mumbai
- * Regional Labour Institutes in Kolkata, Chennai, Faridabad and Kanpur

The Central Labour Institute in Mumbai functions as a socio-economic laboratory and is a national institute dealing with the scientific study of all aspects of industrial development relating to the human factors.

Over the past 33 years the Central Labour Institute has constantly grown not only in size but also in stature and has earned national and international recognition. It has been recognised by the International Labour Organisation as a Centre of Excellence in training on Occupational Safety and Health in the Asian and Pacific Region. It also functions as a National Centre for CIS (International Occupational Safety and Health Information Centre) and the Centre for National Safety and Health Hazard Alert System. At the national level, apart from providing research and training support to the Government and functioning as a technical arm of the Ministry of Labour, the institute provides comprehensive and multi-disciplinary services to the Industrial Port sector through studies, technical advice, training and dissemination of information. It also runs National Referral Diagnostic Centre for early detection of occupational disorders and thereby controls and prevents them. It has a modern Audio Visual Studio fully equipped with sophisticated video production equipment to produce quality U-matic video films on Safety and Health. The Regional Labour Institutes are a scaled-down version of the Central Labour Institute and cater to the needs of their respective regions.

The organisation is poised to grow further, and meet the increased demands on it. In a developing country with a large number of industries having diverse and complex nature, the task of protecting safety and health of workers is an uphill task. Armed with the technology, good-will of the industrial society and the strength of the dedicated staff, the organisation is well prepared to meet the challenges of tomorrow. It is committed to the goal of making the workplace safer.

Visit us at : www.dgfasli.nic.in