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CONTENTS

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FROM THE DESK

Pollution prevention, both inside and outside the factories is definitely the responsibility of the management both at the unit level and at the corporate level. Sometimes because of the pressure of immediate and complicated work need, the managements unknowingly forget to take care of pollution prevention and control. In this issue of INDOSHNEWS, we are publishing an article, which will give an idea to the management on how to go about managing pollution problem. There is nothing new in this. It is accepted as a normal management function. But by seeing that, the problem of industrial pollution prevention and control still exists, we feel, the responsibility of corporate management in the area should be reiterated.

The other article talks about the safety and health problem in lead and zinc-smelting process. The process involves operations, which are likely to generate dust of lead and other toxic minerals. The article tries to be as exhaustive as possible and I hope that people who are expected to take control measures will be benefited from this input.

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

POLLUTION PREVENTION – ROLE OF CORPORATE MANAGEMENT

DR. A.K. MAJUMDAR

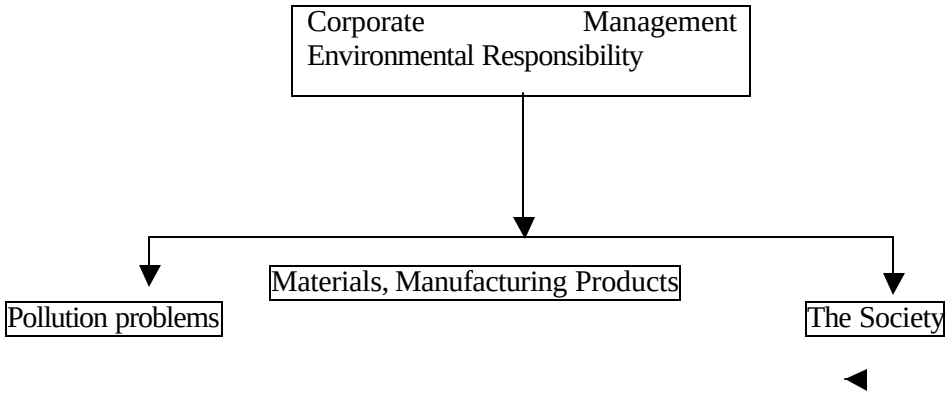
INTRODUCTION

Industry is the world's foremost creator of wealth, employment, trade and technology, as well as the controller of human and financial resources. Industrial and business processes add value to the resources and meet basic human needs. At the same time industry has a known history of creating a variety of environmental pollution problems. Pollution prevention in the industrial sector is hardly a new concept. Industrial operations traditionally have adopted a variety of waste reduction techniques to lower costs of production to increase profits. However, only in recent years economical incentives and the corresponding emphasis on prevention as a management priority have grown more rapidly. The past several years have seen a marked increase in the public's awareness of and concern for a range of environmental issues worldwide. Pollution prevention is the current environmental strategy to minimize pollution problems. It is a management strategy to establish a society oriented approach towards sustainable development.

Corporate management has a great role to play in the environment management programme. Many modern Corporate Executive Officers (CEOs) of multinational companies have integrated their business policies with environment management plan. Companies committed to pollution prevention have to reexamine and reshape their entire enterprise from the products they make, to the technologies they use to make them, to the raw materials they use to make product and even how they market products and think about new acquisitions and investments. Modern managers need to completely integrate pollution prevention thinking absolutely into every part of a company's management system rather than merely focus on regulatory compliance, the traditional environmental approach.

ENVIRONMENTAL RESPONSIBILITY

The corporate management has a responsibility not only to the company which he manages (e.g. materials, products, manufacturing, pollution) but also to the society in which his company functions. Elements of corporate management's environmental responsibility is presented in the figure given below :



Environmental pollution problems can be solved by several means like process modification, equipment redesign, material substitution or other innovative approaches which could greatly reduce or eliminate pollution entirely. To give an example, a factory used solvent Trichloro Ethylene (TCE) to clean components in a vapour degreasing process. TCE is a toxic chemical compound which not only affects the health and safety of workers but is also an environmental pollutant. The factory eliminated the hazards of TCE by changing the process with an efficient cleaning system that used water based non-toxic detergent cleaner instead of TCE. The changes did not compromise cleaning effectiveness. By modifying the cleaning systems, the company eliminated the use of TCE and TCE waste stream. The modification also improved worker's safety and reduced cleaning agent costs.

When polluting materials cannot be removed at the source, they should be recycled, recovered and reused in the manufacturing or in other industrial processes.

Though industrialists have understood the importance of sustainable development, there is always a fear that business excellence and environmental concerns cannot be combined. Researchers found the opposite: they can not be separated (Schmidheiny, 1994). We all agree after studying, worldwide business trends, that tomorrow's winners will be those who make the most and the fastest progress in improving their eco-efficiency.

Business and industry need a new corporate culture and a major commitment to promote environmental awareness among the workers. In-house education and training programmes are essential to teach every employee about environmental issues, pollution prevention and environmental responsibility.

POLLUTION PREVENTION PLAN AND PROGRAMME

Any industrial facility is a complex entity which needs many different skills to operate properly (i.e. management, financing, marketing, purchasing, scheduling, labour, etc.). Planning and implementing a pollution prevention programme is just as complex because pollution prevention ethic must permeate every activity conducted at the facility. However, an industrial facility can benefit from a well planned and executed pollution prevention effort, especially when it is integrated with existing corporate programmes so as to avoid the effort and expense of establishing a new programme.

A successful industrial pollution prevention programme must have a strong and clear policy, established at the highest level; otherwise success with activities at the operational level will be only occasional. The management policy should be so formulated that it integrates laws covering all environmental media including the preventive and anticipatory approach.

The industrial pollution prevention programme must integrate technology into a system which includes organization, operating procedures and investment. Corporate Management plays the key role in developing a comprehensive programme that reaches all levels of a company. The most successful organizations in preventing pollution and minimizing wastes are those that employ multifaceted programmes with the following elements:

- A formal commitment by the management to the pollution prevention ethic, translated by management and employees into a company wide commitment in all divisions of the organization.

- Explicit programmes and goals;
- Accurate accounting to assess costs, benefits and programmes;
- Periodic pollution prevention assessment to identify opportunities for improvement and evaluate progress;
- Periodic self-evaluation that keeps programmes on track; and
- Educational workshop and training materials that share technical information and experience with affiliates, customs, supplies and the public.

In industry, the technical people are concerned with innovative technology, related to environmental quality or process development. Management on the other hand is concerned with profit, growth and survival. The most successful ventures occur when the results of innovation, new product development and process modification, with management support provide substantial cost saving, gross reduction in or elimination of waste discharge and preferably a profit from the new system. All company employees will then have an incentive to participate in a programme in which pollution prevention pays.

Pollution prevention performance of a company must be measured if it is to be improved. Performance is not merely regulatory compliance or how much money has been spent on environmental management programme. Performance must be measured by reliable facts and figures in terms of the redesign, reformulation and the development of innovative processes and products for reduction in the generation of every form of non-product waste out put.

FUTURE OUTLOOK

As corporate management moved into the 21st century, it continues to face economic and environmental challenges from public opinion to global competition. To remain a vital thriving competitor, corporate management must gear up to meet the material and product needs of the next generation of consumers. Business houses and corporate executive officers should take the following steps:

1. Restore public confidence and renew its faith in industry. It won't happen unless industry accepts responsibility for its past actions and voluntarily facilitates changes in its attitude and behavior towards a healthy environment.
2. Think seriously about changes in products, raw-materials and production system that can improve the life cycle environmental performance of products and the company. Develop creative measurement systems to be accountable to the public with credible data.
3. Develop a detailed in-house training programme to improve the environmental literacy of the entire work force and build a new corporate culture that includes a strong environmental ethic.
4. Develop new criteria and priorities for R & D activities to commercialize technological innovations with environmental competitive advantages.
5. Develop, design and operate facilities and conduct activities taking into consideration the efficient use of energy and materials, the sustainable use of

6. renewable resources, the minimization of adverse environmental impact and waste generation and the safe and responsible disposal of residual wastes.

7. Contribute to the transfer of environmentally sound technology and management methods throughout the industrial and public sectors.

8. Measure environmental performance by conducting regular environmental audits and assessment of compliance with company requirements, legal requirements and periodically provide appropriate information to the employees, the authorities, and the public.

9. Avoid confrontation and litigation with pro-active participation and co-operation while dealing with government officials and environmentalists.

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SAFETY & HEALTH PROBLEMS IN LEAD ZINC SMELTING PROCESS

S.S.GAUTAM & P.K.SAXENA

Lead was used to be of concern only to occupational health physicians at one time, but its prevalence in public places and serious effects of micro quantities of this substance among children and infants has brought this substance to public platform. The lead zinc smelters which recover zinc as well as lead in the same system make use of an ore that contains lead as well as zinc. The whole process involves many operations that provide chance for generation of dust containing lead and toxic minerals present in it. The use of hazardous substances like LPG renders the process more hazardous.

Recovery of lead and zinc from an ore that primarily contains lead and zinc along with some quantities of other metals like cadmium, copper and silver involves number of situations that have potential of exposure of industrial workers and surrounding population to toxic substances like lead, cadmium, zinc, copper, silver etc. in addition to other hazards common to the metallurgical industries. The authors were involved in safety audit of a lead zinc smelter in India during first quarter of the year 2002, during which the important health and safety problems of the employees were underlined. An attempt has been made in the present paper to share their experience.

The metallurgical process that is used for simultaneous production of lead and zinc is called Imperial Smelting Process. The main steps of the process are:

Conversion of sulphides of Lead, Zinc, and other metals into oxides in up draft sintering machine.

Reduction of oxides of Lead and Zinc into metallic form in Imperial Smelting Furnace.

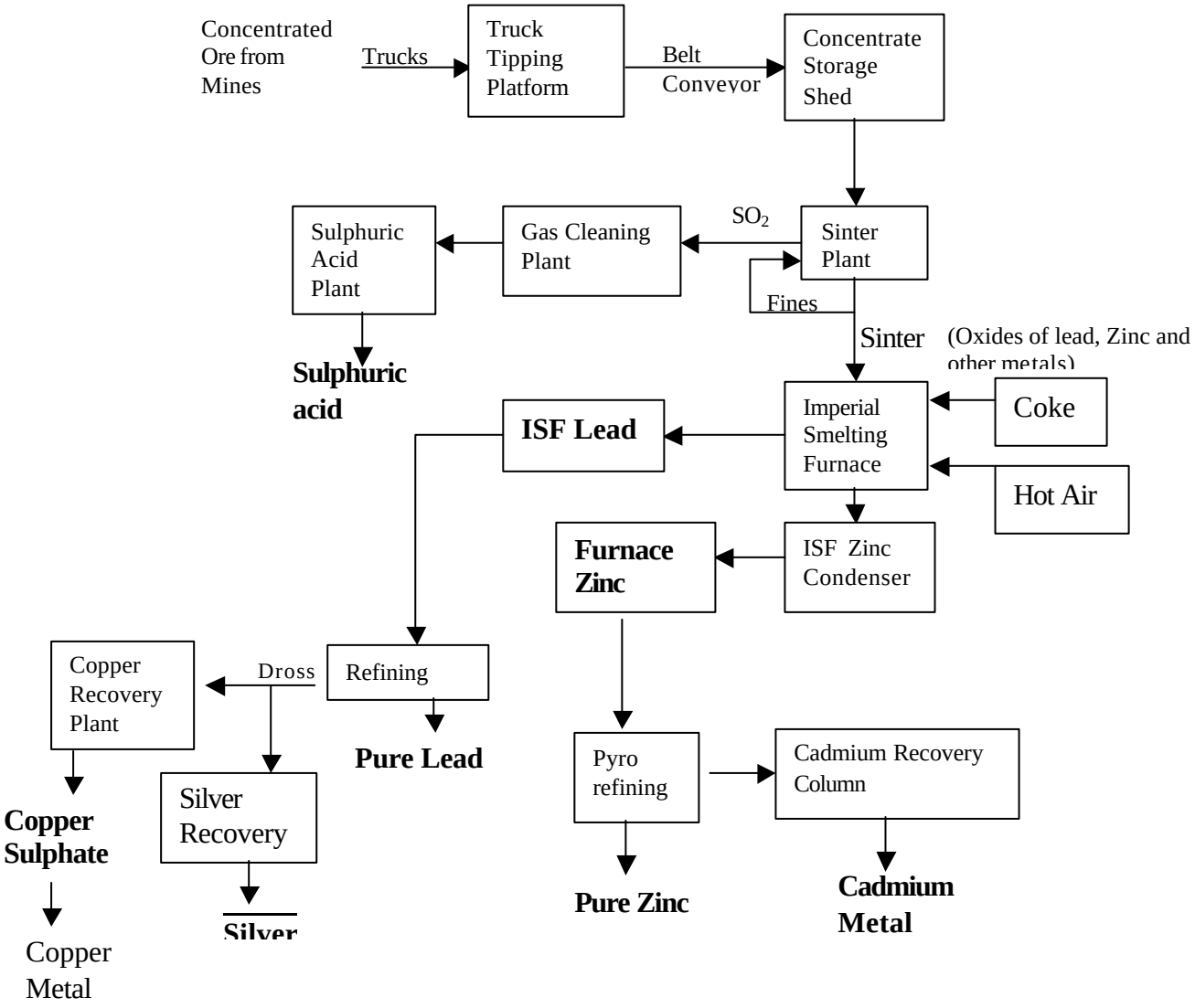
Drossing and refining of Lead.

Recovery of copper and silver from the dross of lead.

Pyro-refining of Zinc.

Recovery of Cadmium by pyro-refining of zinc.

The flow chart of the process is presented in the figure 1.



Raw Material Stock Yard

The concentrated ore, ISF dross, Zinc refinery dross etc. are stored in a shed with the help of a belt conveyor. The raw materials are mixed up in certain proportion in the sinter plant with the help of a belt conveyor and proportioning bin.

Sinter Plant

The charge is heated and oxidised in the presence of fresh air in the sintering machine. The sulphur present as sulphide in the concentrated ore is converted into sulphur dioxide gas. The lead, zinc and other metals are converted into oxides during this process. The grains of sinter which are smaller than 40 mm in size are collected in a bin for further processing after crushing them to 8 mm size. The larger lumps are crushed to this size for further use.

Gas Cleaning Plant

The hot SO_2 gas that is formed in the sintering process is converted into sulphuric acid. Prior to that, the particulate matter suspended in this gas is removed by passing the gas through dry and wet electrostatic precipitators one after other. The gases and vapours like fluorine and mercury are also finally dried to remove the moisture.

Sulphuric Acid Plant

The sulphur dioxide so formed is converted into 98% sulphuric acid by double conversion double absorption process.

Smelting (Simultaneous Production of Lead & Zinc)

The Imperial Smelting Furnace plant consists of charge preparation, furnace charging, furnace, condenser, blast preheating stove, gas washing and distribution of the fuel gas generated during the process. Preheated coke, hot sinter, briquettes and other process waste are fed into the furnace by double bell charging system. The blast air preheated by the low calorific gases generated during the process is introduced into the furnace. Molten lead trickling down the bottom of the furnace is tapped together with slag of molten gang materials. Lead Bullion is separated in a fore-hearth from slag, which is granulated before disposal. Molten bullion is transferred by a ladle to Lead Refinery for production of 99.99% pure Lead.

Production of ISF Zinc

The zinc vapour from the ISF is cooled in an attached condenser under the spray of molten lead. The lead zinc mixture is cooled to a temperature at which the zinc and lead are separated. The top layer of zinc (ISF zinc) is collected and passed on to the zinc refinery where as lower layer of lead is circulated into the system.

The waste gases from the condenser are cleaned and cooled. These contain some quantity of carbon monoxide gas with low calorific value. This gas is used for blast preheating.

Zinc Refinery

The zinc metal produced in Imperial Smelting Furnace is refined by distillation followed by condensation. The distillation process separates zinc and cadmium from a mixture of less volatile metals, whereas the condensation process separates the zinc from cadmium.

Lead Refinery

The molten lead is transferred to the kettles where copper and silver are separated in the form of dross and pure lead is produced.

Copper Recovery Plant

The copper dross produced during the lead refining is screened and grinded. The powder so formed reacts with ammonium carbonate solution with the addition of ammonia liquor and carbon dioxide. The leachate containing copper complex is taken for further processing. Leachate is further filtered before treatment by solvent extraction to recover the copper. Copper is extracted with a copper specific diketone liquid ion-exchange reagent in a hydrocarbon diluent. The loaded organic is then washed with sulphuric acid solution to

form copper sulphate solution. The thickened copper sulphate solution is electrolysed to collect copper as thickened copper cathodes of the cells.

SAFETY & HEALTH PROBLEMS AND THEIR CONTROL

Concentrate Receiving & Transfer to Storage Shed

The concentrate which is enriched ore, contains about 40 % lead. The exposure to the dust containing lead is a serious health risk. The truck unloading point generates high levels of this dust. The workers engaged in facilitating the unloading of concentrate i.e. emptying the truck and passing the lumps through grills are exposed to high dust levels. Even though the concentrate contains about 15% moisture, dust generation takes place. Unloading the trucks under the cover of water spray, provision of vibrating grill, use of effective dust respirators and regular monitoring of breathing zone air for lead exposure and blood lead levels of the exposed workers are some of the measures that should be taken to control the dust exposure.

The belt conveyor provided for transferring the concentrate from the unloading point to the storage shed needs to be maintained properly. Large number of non-rotating rollers, bad conditions of pull chord guard, deposition of excessive dust are some of the areas on which due attention should be given. The underground tunnels under the receiving hopper should be provided with adequate lighting.

Raw Materials Storage Shed

The main hazard of this area is also exposure to lead dust. The main sources of dust in this area include dust from dropping of concentrate while piling, dust generated under the influence of wind, dust generated while operating pay loader, dust generated while loading the batch into belt conveyor hopper, etc. The control measures for these problems include provision of water sprinkler to avoid dust while dropping the concentrate on the piles and to form a crust at the surface of the pile to prevent flying of dust under the influence of wind, provision of forced air ventilation of enclosed cabin of pay loader and control room shed, provision of local exhaust hood at the charging point of the concentrate and other raw materials, sprinkling of water on the floor of the shed to prevent generation of dust on movement of vehicles within the shed. It should also be kept in view that the concentrate contains high concentration of sulphides and any acidification of the substance either in the shed or in the drains may generate hydrogen sulphide gas, which is a deadly poisonous gas.

Sinter Plant

In sinter plant, there are many situations from where dust is likely to generate if dust control arrangements are not made. The local exhaust systems are provided at the design stage, but lack of attention towards their proper functioning reduces their efficiency over a period of time. In order to ensure their proper functioning, the breathing zone air monitoring for dust concentration

and periodic measurement of the face velocities at the hood openings is essential. Many times the ducts are blocked due to inadequate transport velocities within the ducts. Hence proper maintenance of the dust control devices in sinter plant is very important.

The sinter gas which contains sulphur dioxide, is removed from the sinter machine under negative pressure created by the blower provided in the sulphuric acid plant. In case of failure of this blower due to any reason, the gas starts coming out from various openings at many points. Bypass blower is provided to divert the releasing gas towards chimney, but by the time the valves are operated the gas exposure takes place. The sulphur dioxide is an irritant of lower respiratory tract which may lead to acute pulmonary oedema and chronic predisposition to any respiratory ailment. Possibility of automatic device to switch on the by pass blower and to operate the bypass valves should be considered.

The process in the sinter plant is such that a lot of dust is generated and material is spilled. It is suggested that the deposited dust may be cleaned frequently by vacuum cleaning device and the floor should be washed by water jet. Handling of open red-hot sinter generates toxic fume and releases radiant heat and hot gases. Such units and conveyors are required to be properly hooded and connected to the vents to divert the hot and toxic gases out of the work place.

Gas Cleaning

The gas released from the sinter plant contains SO_2 which is converted into sulphuric acid after removing the particulate matter and other impurities from it. First the gas is passed through an electrostatic precipitator. This unit is very hazardous because there is a risk of electric shock, possibility of exposure to toxic SO_2 and exposure to heat stress. Many times persons are required to enter the unit.
There is need for specially drafted permit to work for this unit that may cover all the potential hazards of this units and signatures of all the competent and responsible persons to ensure that any of the above exposures does not take place.

This area is prone to SO_2 gas exposure. At times people are required to attend to certain jobs with the plant running. Arrangement of air-line respirators with full face masks should be provided in this area.

After passing through ESP, the gases are washed to remove the gaseous impurities. The wet gas is highly corrosive. PVC lined vessels are used in this area which often get damaged. A close watch is needed to ensure that the systems do not get corroded. Several FRP vessels are used in this area, which get brittle over a period of time. Approaching the roofs of FRP tanks by the persons has resulted in roof damage and falling of persons into the tank. Provisions of approach ladders and approach platforms not supported on the tanks should be provided to avoid such events.

Proper earthings of dry and wet electrostatic precipitators is very crucial for preventing electric shock due to high voltage in the system. The earth points of these equipments should be periodically checked with proper records.

Imperial Smelting Blast Plant

The charging of coke and the sinter into the imperial blast furnace is done with the help of double cone charging system in order to avoid escape of toxic gases while charging. In spite of this arrangement, some gases escaped from the furnace. These gases are likely to contain toxic carbon monoxide gas in fatal concentrations in addition to lead and zinc fumes. There is a need to provide a local exhaust hood over the charging system to remove the residual gases and fumes from the work shed. Provision of flare stack to burn away the gases should also be considered.

There are chances of CO release in the ISF area. It is advisable that carbon monoxide gas sensors with alarm are provided in this area to warn in case of gas leak. The emergency action plan to handle the emergencies arising from such releases should be prepared and rehearsed frequently.

The tapping of lead from the ISF leads to generation of lead fumes. The local exhaust systems are provided at the design stage, but these should be periodically monitored for efficiency to ensure that no lead fumes are released into the work areas. Regular monitoring of the lead fumes should also be done to ensure a healthy work environment.

Lead Refinery

The molten lead from ISF is transferred to the kettles for refining by removing the dross containing copper and silver. The kettles are provided with agitators. In case of undue cooling of the metal in the kettles there are chances of solidification of the metal, which in turn will damage the agitator. A-meters are provided to monitor the amperage of the agitator motors. There is a need for provision of high amperage alarm for these motors.

The removal of dross from the kettles generates a lot of dust, which should be

removed with the help of mobile local exhaust system. The kettles keep generating lead fumes. The original design of the kettles include local exhaust systems in the kettles with the flap cover on the top to facilitate closing of the top in order to maintain adequate face velocity in the exhaust slots. The common practice, however, is to keep the flaps all the time open. In some cases, the flaps are removed or jammed in open positions due to solidification of spilled molten metal. If ignorance among the workers regarding seriousness of the lead poisoning and roll of the flap cover is removed, such negligence may be avoided.

Wherever molten metal is handled, the chances of spillage of molten metal and its falling on the feet remain. It is often seen that the workers wearing gum boots insert their trousers into the gumboot openings. There have been cases when molten metal fallen on the opening of the gum boots has entered the gum boots. Hence, it is advisable that the trousers should be spread over the gum boot openings to avoid entry of molten metal into them.

The dross removed from the kettles may contain arsenic in it, which may generate deadly poisonous arsine gas in case of moistening of the dross. It is suggested that arsine indicating papers should be hanged wherever there are possibilities of arsine release.

The ingot making plants are provided with overflow points to discharge any excessive material, but if a vessel is not kept under the spout, the falling molten metal will lead to splashes. Hence receiving vessels should be kept under the overflow spout.

Keeping in view the hazards of the area, every worker should be equipped with the personal protective equipment like face shield, heat resistant hand gloves, aprons and foot wears.

Zinc Refinery

Zinc fumes are less toxic as compared to the lead fumes; yet, if freshly formed zinc fumes are inhaled, an acute lung condition known as zinc fume fever may occur. There are several points in the lead refinery from where there is a possibility of release of zinc fumes. It is advisable that all the points from where there is a chance for the zinc fumes to get released should be provided with canopies with proper ducting to remove the hot zinc fumes from the point of generation.

The zinc refinery and lead refinery involve quite hot operations. It is advisable that forced air-cooling points should be provided at the fixed work locations to reduce the heat stress among the workers.

Sulphuric Acid Plant

Sulphuric acid is made by converting the sulphur dioxide gas into sulphur trioxide gas and its subsequent absorption in dilute sulphuric acid to get concentrate sulphuric acid. The blower, the hazards of sulphuric acid plant are similar to any other sulphuric acid plants. Any failure in the plant leading to disturbance of the process causes dropping of the converter temperature, which in turn reduces the conversion efficiency. Such events result in the release of unconverted sulphur dioxide gas from the chimney. Keeping these problems in view, it is advisable that gas blower, air blower, acid circulation pump, etc. should be so interlocked that unabsorbed gas are not released in case of failure of absorption process. The caustic scrubber should be provided to neutralise the unabsorbed gases in case of any abnormality.

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STUDY ON THE OCCUPATIONAL HEALTH STATUS OF EMPLOYEES WORKING ON PANELS AND PERSONAL COMPUTERS IN A PETROLEUM COMPANY

This study was carried out by the Central Labour Institute, Mumbai in a petroleum company. The study was based on questionnaire, medical examination and tests.

FINDINGS

Backache and headache (39.7%), visual problems (27.9%), neck pain (26.5%) and shoulder pain (19.1%) were the major symptoms reported in Panel Officers whereas neck pain (46.7%), headache (40%) visual problem (33.3%) and shoulder pain and back pain (26.7% each) were the major symptoms reported by PC users.

Blurring of vision was the most common visual symptom amongst all employees.

A high prevalence of hypertension was observed in case of Panel Officers (19.1%) and PC users (20%) as compared to employees doing mixed type of jobs (11.1%)

In titmus vision test, employees having some form of visual deficiencies reported higher visual complaints than those having normal or corrected vision amongst all categories of job.

RECOMMENDATION

- The medical examination of the employees may be carried out with special emphasis on vision standards required for work on VDTs, as well as for any evidence of/or pre-disposition towards musculoskeletal disorders with a view to contain the morbidity.
- Periodical medical examinations should be conducted with special emphasis on the early detection of various morbidity conditions that are known to exist in the industry dealing with VDTs. Such of those cases who are identified to be suffering from visual, musculoskeletal or other related disorders should be evaluated by an occupational physician for appropriate management of individual cases.
- All the employees working on VDTs should undergo awareness programmes on various aspects of early signs and symptoms of work related conditions, prevention and control measures including ergonomic workstation design aspects.
- The employees working with VDTs should undergo a detailed eye check up annually and correction of their visual condition in relation to their working needs like correction of near vision for intermediate distances.
- A follow up study should be undertaken after a suitable interval following the implementation of the recommendations.

- On 6.6.2002, a supervisor of a transporter while checking the tally block/seal on the containers in a port was injured under the wheel of a trailer truck. The victim received fatal injuries and died in the hospital.

  Investigation of the accident revealed that the accident had occurred mainly due to the negligence on the part of the victim himself as well as on the part of the driver of the trailer truck. The port authorities were advised to conduct investigation of such serious accidents by the Safety Officer of the Port, as required under the Regulation 93 of the Dock Workers (Safety, Health& Welfare) Regulations, 1990

- On 7.7.2002 a dock worker moving on a bike took a short cut to go over to the canteen facilities provided in the adjacent Port Trust. On his way he collided with a trailer truck and was dragged under its wheels. The victim sustained injuries and died in the hospital.

  The investigation of the accident revealed that the accident occurred due to negligence on the part of the trailer truck. The driver was warned for his negligence.

- On 13.8.2002, the work of heaping wheat in bulk was being carried out with the use of front end loader in a port. During the course of this work, the front end loader moving on the reverse passed over the cleaner of the front end loader itself who was sleeping nearby atop gunny bags. The victim died on the spot.

  The investigation of the accident revealed that the accident had happened mainly due to the negligence of the front end loader driver. The driver was warned for breach of section 11(1)(b) of the Dock Workers (Safety, Health and Welfare) Act, 1986 and the concerned employer was warned for breach of regulation 117 of the Dock Workers (Safety, Health and Welfare) Regulations, 1990.

ADVANCED TRAINING PROGRAMME ON OCCUPATIONAL HEALTH AND ENVIRONMENTAL MEDICINE

PROGRAMME PERSPECTIVE

Occupational health is not merely a science which deals with work related disorders/diseases, but has developed to encompass all the factors, which affect the community health within it. Needless to say therefore, that in this fast developing industrial scenario, the role of doctors has become very demanding and those who are unable to maintain the pace with such development will be left behind. This needs a regular updating of the information on occupational health so that knowledge and skills of doctors are appropriately strengthened for better occupational health management of workers. This training course is tailor-made for this purpose. Factory medical officers, medical officers of enforcement agencies and other medical professionals engaged in health care of the community in general and industrial workers in particular will be benefited most by this course. On completion of the course, it is expected that medical officers shall be able to develop the appropriate strategies for the occupational health protection of the workers, prevention of occupational diseases and better compliance of rules.

TECHNIQUES

The training will be conducted through class room lectures, group discussions, field visits, scientific audio visual presentations, laboratory visits and demonstrations etc. English will be the medium of the training programme.

HIGHLIGHTS

- Challenges of occupational health in the new millennium, Occupational health management and productivity, environmental issues involved in occupational health practice, social dimension of occupational health, medical emergency response planning, de-addiction planning.

- Developments and recent advances in management of occupational health hazards, advancement and development in technique and assessment of work environment, role of occupational health in total safety programme, selection of PPE.

- Occupational musculo-skeletal disorders, adverse effects of noise, heat etc., occupational skin diseases, occupational stress.

- Occupational health management, factory legislation and organization of occupational health service at workplace and medical surveillance in industry.

PARTICIPANTS

Medical doctors (MBBS) from factories, ports and docks, mines, plantations, ESIS, ESIC, certifying surgeons, general practitioners, medical college teachers, etc.

FACULTY

Eminent experts on the topics from hospitals, institutions, industries, will be faculties besides the experts of DGFASLI and Central Labour Institute.

Conducted by: Industrial Medicine 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: Monoterpene and wood dust exposures: Work-related symptoms among Finnish sawmill workers.

CIS ACCESSION NUMBER
CIS 02-844

ABSTRACT

This study was carried out on 22 Finnish sawmill workers who processed pine and spruce between 1997 and 1999. Exposure to monoterpenes was assessed by determining monoterpenes in air and verbenols in urine. A questionnaire was used to evaluate work-related subjective symptoms. The highest monoterpene concentration in the breathing zone, measured during processing of pine, was less than one fourth of the Finnish occupational exposure limit (OEL,70mg/m^3). Verbenol concentrations in post-shift urin samples reflected accurately the exposure to monoterpenes. The concentrations of inhalable dust were less than one-half the Finnish OEL(5mg/m^3). No significant differences in dust exposure were observed among tree species processed. Work-related eye, skin and respiratory symptoms appeared to coorelate with monoterpene exposure during processing of pine and with wood dust exposure during processing of spruce.

Note:

For details write to CIS National Centre for India, Central Labour Institute, Sion, Mumbai 400022.

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 IDENTIFICATION

Chemical Name and Synonyms:
Methyl methacrylate (monomer);
Methyl 2-methpropenoate

REACTIVITY DATA

Chemical Stability: Liquid is stable in the presence of inhibitor; the presence of oxygen is necessary for effectiveness of the inhibitors. Vapour (which is not inhibited) may polymerize violently or explosively.

Incompatibility with other substances: Contact with strong oxidizers, strong alkalis, strong acids, reducing agents, amines, halogens, azo-compounds, catalytic metals (copper,iron), can cause explosive polymerization. Contact with propionaldehyde can cause rapid exothermic reaction and explosion. Not corrosive to stainless steel or aluminum.

Reactivity: Can self-polymerize and become explosive. Polymerizes readily and explosively if inhibitor is depleted, if exposed to heat or sunlight (ultraviolet light), ionizing radiation or incompatible materials, or if a vapour. Auto-oxidation leads to the formation of polymeric peroxide, which is unstable and explodes above 40C. Avoid excessive temperatures, all ignition sources, incompatible materials, ultraviolent light, inhibitor depletion, oxygen depletion or oxygen-free atmospheres, corrosion of storage containers.

Hazardous Decomposition Products: COx

FIRE AND EXPLOSION DATA

Flammability: Flammable liquid and vapour. Can form explosive mixtures with air at or above 2 C. Vapours may travel to distant source of ignition and flash back. Liquid can float on water and spread fire. Hazardous polymerization may occur under fire conditions. Vapours may polymerize explosively.

Extinguishing Media: Dry chemical, alcohol or polymer foam or carbon dioxide. Water spray or fog may be ineffective for extinguishing fire, but may be used to cool containers, disperse vapours, and flush spills away from ignition source. Fire fighters must wear protective equipment (positive-pressure, full face-piece self-contained breathing apparatus) and clothing (chemical splash suit) sufficient to prevent inhalation and contact.

Effects of Acute Exposure to Product:

Inhaled:Low concentrations cause irritation. May cause pulmonary edema with shortness of breath, chest pain. Symptoms may develop up to 24 hours after exposure. May be harmful. High concentrations may cause CNS depression, with headache, drowsiness, confusion. Very high concentrations may cause loss of consciousness and even death.

In contact with skin: May cause mild irritation. Systemic effects through skin absorption are unlikely; toxic levels are unlikely to be reached through skin exposure.

In contact with eyes: Vapour or liquid may cause moderate irritation, based on animal information. No human information available.

Ingested: May cause irritation, nausea and vomiting, symptoms of CNS depression,headache, dizziness, confusion based on aminal information. No human information available. Unlikely route of occupational exposure

Effects of Chronic Exposure to Product: Prolonged exposure can cause CNS disturbances, cardiovascular and blood chemistry effects, liver damage. May cause allergic skin or respiratory sensitization. Persons with pre-existing skin or eye disorders, or with impaired kidney or respiratory function may be more susceptible to the effects.

Carcinogenicity: Not considered carcinogenic to humans.

Teratogenicity:No human information available. No effects in animals at levels that were not toxic to the mother.

Reproductive Effects: No effects in animal testing.
Mutagenicity: Negative in vivo animal testing.
Synergistic Products: None known

PREVENTIVE MEASURES

Engineering Controls:Local exhaust ventilation required.

Respiratory Protection:Up to 1,000 ppm: NIOSH/MSHA approved respirator with organic vapour cartridges, or continuous-flow supplied-air respirator or powered air-purifying respirator with organic vapour cartridges. Higher or unknown concentrations, as in fire or spill conditions: positive pressure, full face piece self-contained breathing apparatus, or positive pressure, full face-piece air-supplied respirator with an auxiliary positive pressure self-contained breathing apparatus.

Eye Protection: Chemical goggles and/or face shield.

Skin Protection: Polyvinyl alcohol, 4H, Barricade, Trellchem gloves. Other impervious protective clothing, apron, sleeves, coveralls, boots, as required to prevent contact.

Other Personal Protective Equipment: Safety shower and eye bath located close to chemical exposure area.

Leak and Spill Procedure: Eliminate all sources of ignition. Evacuate area. Cleanup personnel must be thoroughly trained in the hazards of this chemical and must wear protective equipment and clothing sufficient to prevent inhalation of vapours or mists and contact with skin and eyes. Stop or reduce discharge if safe to do so. Contain spill with inert absorbent (sand, earth). Prevent from entering sewers or waterways. Recover product and collect contaminated soil for disposal. Collect waste for disposal. Contaminated absorbent may pose the same hazards as the spilled product. Flush area of spill with running water.

Waste Disposal: Follow all federal, provincial, and local regulations.

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 1,20,000 chemicals/materials are available with Central Labour Institute. Computer printout will be supplied on nominal charge basis.

COMPUTER'S MOUSE MAY 'BITE' HANDS, WRIST, NECK

The more you click using your computer's mouse, the greater the chance of suffering from pain, swelling, numbness and other problems in the hand, wrist neck and shoulder, two teams of Danish researchers reported at a meeting. In one study, Dr.Chris Jensen and colleagues from the National Institute of Occupational Health in Copenhagen found that workers who used computers for more than two thirds of their work time had a higher risk of developing hand or wrist problems.

However, those who worked in front of a computer almost all day and used the mouse at least half the time had a four-fold higher risk of problems than those who used the computer the same amount of time but used the mouse only a quarter of the time.

The findings came from a survey of nearly 3,500 workers at 11 Danish companies, with follow-up about a year and a half later. "The problem is not only the mouse, but performing repetitive tasks" Jensen said.

In a second study, researchers from the Odense University Hospital and Glostrup and Herning hospitals found that those who used the mouse for more than 30 hours per week had as much as an eight-fold higher risk of developing forearm pain, double the risk of moderate to severe neck pain and triple the risk shoulder pain. Neck and right shoulder symptoms started to become evident after more than 25 and five hours of weekly use, respectively.

The findings came from a survey of nearly 7,000 technical assistants and machine technicians, with a follow up one year later. Certain professionals were particularly at risk, the researchers note.

"Computer-assisted designers use the mouse almost all the time", co-author Lars Brandt of Odense University Hospital told Reuters Health. Having a demanding job seems to aggravate the problem, he added. Jensen said that a variable pattern of mouse and key board use can be considered the best combination from an occupational health perspective. Other measures had uncertain effects. Around 80% of Danish workers used traditional instead of newer "ergonomic" mouse devices, but none of the studies examined differences between users of either type of mouse.

"My impression is that it does not really matter so much which device you use. I do not believe that you can invent a device capable of solving these problems", Jensen said. "You could try some preventive exercises instead, but I think the best thing .. is that they keep you away from the mouse or the keyboard while doing them". Both studies were presented at the 27th International Congress of Occupational Health.

Source: Business Standard

TRAINING PROGRAMMES
JULY TO SEPTEMBER 2003
CENTRAL LABOUR INSTITUTE ,SION,
MUMBAI-400 022

Programme title	Contact person
Diploma in Industrial Safety	Director (Safety) & Incharge Indl. Safety Division
Workshop on Safety Audit on Environmental Management System	Director (Safety) & Incharge Indl. Safety Division
Workshop on Safety in Construction Industry	Director (Safety) & Incharge Indl. Safety Division
Training programme on Industrial Safety for NSC Maharashtra Chapter	Director (Safety) & Incharge Indl. Safety Division
Safety,Health & Environment Management in TPP	Director (Indl.Hygiene)&Incharge Indl.Hygiene Division
Safety,Health & Environment Management in Drugs & Pharmaceutical Industry	Director (Indl.Hygiene)&Incharge Indl.Hygiene Division
Chemical Safety & Major Accident Hazard Control	Director (Indl.Hygiene) & Incharge Major Accident Hazard Control Advisory Division
Training Workshop on Training Methodology for Trainers	Director (Staff Trg.) & Incharge Staff Training Division
Occupational Health Hazard of VDT users in Office & Workshop-its remedial measures through Ergonomics-approach	Director (Physiology) & Incharge Indl.Ergonomics Division
Workshop on Anthropometry – its application in industries for Ideal Workstation Design for Safety, Health & Productivity	Director (Physiology) & Incharge Indl.Ergonomics Division
Industrial Ergonomics – its application in Industries for Promotion of Safety, Health & Increased Productivity at Work	Director (Physiology) & Incharge Indl.Ergonomics Division

Training Methodology for Trainers(TMT)	Director (Staff Trg.) & Incharge Staff Training Division
One month specialised certificate Course for Supervisors working in Hazardous Process Industries	Director (Staff Trg.) & Incharge Staff Training Division
Industrial Fatigue – its Evaluation & Management for ensuring Safety, Health & Productivity at Work	Director (Physiology) & Incharge Indl. Physiology Division
Selection Criteria of Industrial Workforce for Safety, Health & Productivity at Work	Director (Physiology) & Incharge Indl. Physiology Division
Management of Occupational Back Pain for Safety, Health & Productivity	Director (Physiology) & Incharge Indl. Physiology Division
Understanding Human Behaviour For Safety, Health & Productivity	Director (Indl.Psychology) & Incharge Indl.Psychology Division
Associate Fellowship of Industrial Health	Director (Medical) & Incharge Indl. Medicine Division
Training programme on Occupational Health Practice for Nurses, Health Medical Assistants	Director (Medical) & Incharge Indl. Medicine Division
Wage & Salary Management	Director (Productivity) & Incharge Productivity Division
Noise & Heat Hazard and their Control in Industry	Director-in-charge, Environmental Engineering Division

TRAINING PROGRAMMES
JULY-SEPTEMBER 2003
REGIONAL LABOUR INSTITUTE , LAKE TOWN
KOLKATA-700 089

Programme title	Contact person
Workers Development Programme	Director Incharge
Appreciation course on Industrial Hygiene	Director Incharge
Higher Productivity and Better Place to Work	Director Incharge
Training programme on Emergency Planning & Preparedness in MAHC Installation	Director Incharge

TRAINING PROGRAMMES
JULY-SEPTEMBER 2003
REGIONAL LABOUR INSTITUTE , NO.1,SARDAR PATEL ROAD
ADYAR, CHENNAI-600 113

Programme title	Contact person
Diploma Course in Industrial Safety	Director Incharge
Training Programme on Safety Audit	Director Incharge
Training Programme on Major Accident Hazard Control	Director Incharge

TRAINING PROGRAMMES
JULY-SEPTEMBER 2003
REGIONAL LABOUR INSTITUTE, SARVODAYA NAGAR
KANPUR- 208 005

Programme title	Contact person
Diploma Course in Industrial Safety	Director Incharge
Training programme on Team Building for Safety,Health & Welfareat Work	Director Incharge
Training programme on Industrial Hygiene	Director Incharge
Training programme on Chemical Safety	Director Incharge
Workshop on Dispersion Modeling & Impact Calculations	Director Incharge

TRAINING PROGRAMMES
JANUARY TO DECEMBER 2003 (TENTATIVE)
REGIONAL LABOUR INSTITUTE
S.C.F-46, SECTOR 19, PART-II MARKET, FARIDABAD

Programme title	Contact person
Effective Supervision in Managing Safety, Health and Environment	Deputy Director (Indl.Psy.)
Team Building for Safety, Health and Welfare	Deputy Director (Indl.Psy.)
Personal Growth & Group Dynamics	Deputy Director (Indl.Psy.)
Safety in Engineering Industry	Deputy Director (Indl.Psy.)
Management of Human Factors at Work	Deputy Director (Indl.Psy.)

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