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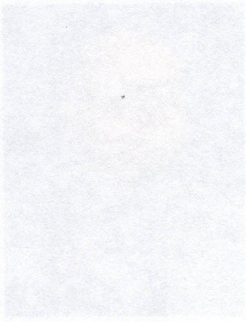
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FROM THE DESK

As we are aware the previous century was an era of chemical sciences & technology, which has given enormous consumable goods to the people of India and enabled food security to the mind boggling growing population in spite of advancements made in the population control technology. This could have been possible for the simultaneous growth and developments that was necessary in the manufacture of chemical pesticides, herbicides and chemical fertilizers. Lately it was also realized that these chemical products caused simultaneous damage to the biosphere as a result newer dimensions of environmental related problems became of greater concern worldwide. Twenty first century is going to be an era of 2nd green revolution and information technology and the bio - technology is going to be the fulcrum of development for the nation. Under that there is going to be a drift from chemical fertilizers to bio-fertilizers, chemical pesticides to bio-pesticides, population control to population stabilization and the essence of the 2nd green revolution would be to fertilize the land and sterilize the man.

Occupational and environmental problems due to use of chemical fertilizers is presented in this cover feature. Necessary control measures to deal with those problems are also discussed in this article. I hope the industry in particular the fertilizer and pesticides manufacturing sectors take advantage of the information and practice the measures suggested there in.

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

**OCCUPATIONAL & ENVIRONMENTAL HEALTH PROBLEMS IN
FERTILIZER PLANTS**

Dr R.B.Raidas

Modern industrial processes present many hazards to the health of the employees. Toxic dust, fumes, gases, mist, vapors and physical factors like heat, noise, vibration and radiations are the few common hazards those are encountered in industries and the fertilizer industry is not an exception.

There are about 28 large scale and more than a hundred small scale fertilizer units in India and therefore the population exposed to the risk of variety of health hazards, is quite large.

Common occupational health problems encountered in Fertilizer plants can be categorized as:

1. Poisoning by toxic fume, gases and mists.
2. Dust hazards.
3. Physical hazards due to noise, vibration, heat and radiations
4. Skin problems due to irritant chemicals

A brief account of the aforementioned hazards is given in the following paragraphs.

1. POISONING BY TOXIC CHEMICALS:

A Comprehensive list of toxic agents observed in the ambient working environment at different operational sites of a fertilizer plant is:

- | | |
|---------------------------------------|------------------------|
| - H ₂ SO ₄ mist | - Naphtha fumes/vapors |
| - CO gas | - Methanol Vapor |
| - CO ₂ gas | - Fluorine compounds |
| - H ₂ S gas | - HCl |
| - SO ₂ gas | - HF |
| - SO ₃ | - HNO ₃ |
| - NO ₂ gas | |

Hazards of Sulphuric acid mist, gaseous Ammonia, Sulphur dioxide and trioxide are

seen in those fertilizer units, which primarily produce Urea and Ammonium sulphate. There is a probability of Carbon monoxide and dioxide gaseous exposure, where Coal or Naphtha is used as raw material in the process of Urea Synthesis.

Gaseous exposures to H₂S, CO & CO₂ and Naphtha vapors are likely where Naphtha is used as a raw material. Exposure to Fluorine compounds can occur in those plants, which are involved in manufacture of Super phosphate fertilizers using rock phosphate as a raw material. Exposure to all those toxic substances usually occur due to faulty design of the machine or process and also due to the poor maintenance of the equipments and lack of awareness among the workmen. As a result, toxic substances escape into the ambient work environment and pose problems.

The ill effects of these toxic gases and fumes on the health of workers may be acute when such chemicals are there in high concentrations, which usually occur due to sudden leakages. The ill effects may be long term resulting in chronic ailments that normally occur as a consequence of frequent exposures to lower levels of those toxic chemicals. The type and acuity of such an adverse effect will depend on the chemical nature of substance, its dose, duration of exposure and degree of exertion and individual susceptibility of workmen.

Ammonia, Sulphur dioxide, trioxide and Sulphuric acid mist are irritant substances. Based on the contributing factors

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described in the preceding paragraphs, the effects of these chemicals are variable and the variation may be from simple irritation of skin, eyes and respiratory tract to sensation of choking and even fatality due to pulmonary edema.

The long term effects of such irritant substances, particularly, Sulphur dioxide may be in the form of a symptom complex characterized by Chronic Naso-pharyngitis, partial loss of sense of smell and taste, dyspnea on exertion and increased fatigue from work.

NH₃ and SO₂ cause burn injuries of eye leading to corneal ulceration, opacity, as well as diminished vision. Cataract development is also reported in workmen having long - term exposure to NH₃, which could easily diffuse into the anterior chamber of the eye - ball and irritate the lens on the eye. An air borne level of 2000 ppm of Ammonia or 4000 ppm of sulphur dioxide has been known to knock down even those with brief periods of exposure and result in fatality due to pulmonary edema. CO and H₂S are known chemical asphyxiants and are highly dangerous for brief exposures to high concentrations and the exposed individuals drop down dead like a hot potato especially in confined space work. Lower levels of these poisons are also known to produce symptoms like headache, nausea, tiredness and dizziness depending on their air borne concentrations and duration of exposure. 3500 ppm of CO and 600 ppm of H₂S may instantaneously kill those exposed.

A disease known as Fluorosis occurs due to exposure of fluorine containing substances. The classical clinical presentation of the disease includes mottling of teeth, spondylosis, bony deformities and anemia. However the classical symptom of

occupational fluorosis due to exposure to Rock phosphate dust is bony fractures occurring after trivial trauma. Repeated exposures to Naphtha vapors can cause disorders such as Keratitis, optic neuritis, toxic anemia, liver and kidney damage. One thing that is very striking is that the disorders occurring due to the inhalation of toxic chemicals could be easily prevented if we can control the INHALATION through environmental measures such as:

- ⇒ By improving the general ventilation system and by providing local exhaust ventilation at source so that the prevailing levels of air borne contaminants are maintained below the safer Permissible Levels of Exposure (PLE).
- ⇒ Periodic monitoring of existing levels of toxic chemicals in the work places so as to judge the magnitude of health risk as well as the effectiveness of the ventilation system installed for. This is a statutory requirement too as per the Factory Act as amended in 1986.
- ⇒ By subjecting the exposed workers to periodic medical examination with the objective of identifying any occupational disease arising out of such jobs and during the course of employment. This will also help in isolating individuals suffering from occupational diseases.

Section 13 and 14 of the factory act also stipulates essential provisions to be made to improve the ventilation system where the toxic dusts and fumes are generated during the work processes.

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Specific precautions that need to be taken to safe guard the workers against dangerous fumes are also stipulated under the factory act in the section 36.

- ⇒ By providing the workmen with personal protective equipments such as dust/gas masks, respirators as the last resort only if the adequacy of engineering controls could not be ensured

2. DUST HAZARDS:

Depending on the type of the raw materials used and the final products, Fertilizer plants may involve varieties of occupational health hazards to its workmen especially owing to the risk of Dust hazards such as those due to Dust of Rock Phosphates, Coal, sulphur, and Urea and ammonium sulphate. The last two are encountered in specific locations like Silos and bagging plants. The dust of urea & ammonium sulphates is primarily of irritant nature and produce symptoms like Cough and Nasal irritation. Sculpture dust is irritating, particularly to the eyes. No serious lung diseases are caused but eye protection is needed.

Coal dust is generated in those Fertilizer plants, which use Coal as a raw material. A disease known as Coal workers pneumoconiosis is a well - established disease of the lungs and it results after prolonged inhalation of coal dust. It is relevant to quote here that the said disease caused due to coal dust is notifiable under Factory Act. It is also a compensational disease under workmen's compensation act as well as under ESI Act.

A group of occupational disorders results subsequent to exposure to Rock phosphate dusts in super phosphate fertilizer plants. As

the Rock phosphate contains more than 10% of free silica, 4% free Fluorine as CaF and since it is treated with Sulphuric acid in the process, chronic inhalation of the mixed dust by the workmen result in the development of a group of ailments which are:

- ⇒ Silicosis of lung.
- ⇒ Fluorosis of bones and ligaments.
- ⇒ Anemia.
- ⇒ Gastritis.

The Preventive measures to control such diseases should comprise of the following:

- ⇒ Suitable Dust control measures.
- ⇒ Wearing dust masks.
- ⇒ Subjecting the workmen so exposed to periodic medical examination including specific tests such as Lung Function tests, X-Rays of Chest and Limbs.

3. PHYSICAL HAZARDS

NOISE HAZARDS: Quite a good number of machines are under operation at one point of time in fertilizer units, which emit noise and the levels of noise may be excessive, particularly in Boiler areas. Varieties of health disorders as a result of exposure to excessive noise have been established. It may be in the form of mental irritation, annoyance, fatigue, sleep disturbance, hypertension, peptic ulcerations etc. The efficiency of the workers is also reduced and the accident proneness is increased and the productivity is also affected.

A serious damage to the hearing system attributed to excessive noise exposure is well established, the severity of which depends on the intensity of noise and duration of exposure. The deafness occurring due to noise is quite specific and

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characterized by the fact that in the initial stages the worker develops only high frequency deafness and he has no difficulty in conversation. This stage may be very long and may vary from 5-10 or even 15-20 years. Therefore, we have enough time at our hand for implementing the remedial measures, provided, we are really aware of the benefits of hearing conservation program.

If we fail to do the necessary control measures during the initial stages and the workforce continues that job in the noisy atmosphere, a time will come when a person enters a stage where speech range also gets involved and the worker develops society deafness. The deafness now becomes irreversible and permanent and there is no cure also. Such deafness also becomes a compensational injury. As per the Workmen Compensation Amendment Act, 1979, the occupational deafness is compensational in India. It is compensational under the ESI Act too.

How to tackle the Noise problem?

- ⇒ As the TLV of noise exposure as recommended by the Scientific body i.e. ACGIH is available (85 db for 8 hours exposure), the existing noise levels in the work environment can be measured periodically to assess whether it exceeds the limit and is unsafe.
- ⇒ Simultaneously the Audiometric testing of workmen should be carried out during periodic medical examination to identify the initial stages of deafness.
- ⇒ Once the gravity of the problem has been identified, then one can go for noise control measures. Lot of engineering control measures are available for noise reduction.
- ⇒ The workers can also be provided

with ear protectors if the control measures are not carried out.

- ⇒ Motivation of workers is also essential to ensure regular use of ear protectors by the workers.
- ⇒ If necessary, the affected workmen can be isolated and placed in a quiet job before he develops the permanent damage.

The Factory Model Rules under Rule 116 as per Section 89 of the Factories Act prescribes the permissible levels of noise and it is the responsibility of the management to see that the existing environmental noise levels do not exceed the prescribed permissible levels.

HAZARDS OF HEAT: The temperature of the human body is maintained by its internal metabolism to around 98.6°F whatever the outside temperature be as body tissues' functions are normal at this temperature. The human body also behaves like a black body gaining heat constantly from outside source. It maintains the body temperature by losing heat as a result of reflex sweating and the evaporation of sweat.

Naturally, the comfort of the human system can be influenced by 4 external factors like air temperature, radiant heat, air movement and humidity of the air. In fertilizer industry, excessive heat is generated, as most of the chemical reactions, which take place in the process, are endothermic. Radiant heat is also emitted particularly in furnace area and the atmosphere at most of the places is also humid because of the moist heat generated by Boilers and the steam leaks through pipes. The situation becomes worse when strenuous manual work is also involved and it becomes further acute when such a condition exists in tropical country like

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India. The clinical effects of heat stress can be in the form of heat cramps, heat exhaustion, heat syncope and heat stroke. The overall efficiency of the workforce also comes down. People already suffering from heart diseases, kidney diseases and diabetes, hypertension, thyroid diseases under medication with analgesic tablets, may be the most uncomfortable and suffer the most under such a situation. For gainful work involving sustained and repeated effort, a reasonable temperature of 38°C should be considered as the level of permissible exposure to heat.

According to recent developments, the most acceptable and simple index of Heat Stress evaluation is WBGT Index. The legal provisions for maintaining the comfortable temperature at workplace also exist as per Section 13 of the Factories Act. The role of heat protective clothing under the Indian conditions is very limited and what can be more helpful is the provision of drinking water facility as near as possible to the place of work and workers encouraged to make use of it frequently, and also by the introduction of rest pause system.

4. SKIN PROBLEMS:

Skin problems in fertilizer workers are caused as a result of direct contact with Chemicals such as Acids, Alkalis, Naphtha and other petroleum products used in the processes. Chances of such problems should be rare as because the processes in fertilizers are more or less mechanized and enclosed. But the occurrence of such problems can be frequent because of frequent shutdowns and maintenance work. The skin disease causes pain, misery, disfigurement, loss of income and time. Incapacity to work also develops and there is increase in the rate of sickness absentees and cost of curative medical care. Practicing good standards of personal

hygiene is the most important measure to combat skin problems and therefore, there is a need for proper education of workers in this regard. Decontamination facility such as the safety showers and eye fountains should be available as near as possible to the risk areas and it should be provided as per the scale laid down under the Factory Act. Encouraging hand washing will reduce many skin problems.

5. ENVIRONMENTAL HEALTH HAZARDS TO THE COMMUNITY

In the industries one may be dealing with chemicals, which are known harmful agents. It has also been proved beyond doubt that the hazards of such toxic chemicals in the industry are not related to the industrial worker alone. This is because the toxic chemical from the industry disseminated in the air or water produce harmful effects on the population around such an industrial complex. This is true for fertilizers also as because toxic emissions through stacks like SO₂, NH₃, acids, alkalis, mists and the discharge of toxic effluents like arsenical and chromium compounds, nitrogenous matter, acids, alkalis are the common occurrences.

It is a social obligation as per Section 12 of the Factories Act, arrangement for the treatment of wastes and effluents to render them innocuous before disposal and the type of arrangement to be made in this regard is framed by the State government and made available in the Factory Model Rules of the respective state.

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CONSULTANCY/RESEARCH

ENVIRONMENTAL STUDY IN BRAKE LININGS MANUFACTURING INDUSTRY

This study was carried out by Regional Labour Institute, Chennai.

OBJECTIVE

The aim and objective of the study was to assess the levels of airborne asbestos fibres in work environment and to suggest remedial measures wherever necessary to improve the environmental conditions.

ABOUT THE FACTORY

This factory is engaged in the production of brake linings for use in various types of automobiles. Asbestos fibre is one of the basic raw materials used in the process.

METHODOLOGY

Samples of airborne fibres in different areas were collected on 25 mm membrane filter paper. After collection, the filter papers were transformed into transparent membrane using standard method recommended by AIA/BSI. The fibres were counted at 400 magnification using Phase Contrast Microscope and results were expressed as fiber/cc.

RESULTS

The average concentration of Asbestos fibres in all the three areas i.e. compounding area, pre-forming area and finishing area were found to range from 0.065 to 0.10 fibre/cc which is below the permissible level for asbestos fibres i.e. 1 fibre/cc.

RECOMMENDATIONS

However, the remedial and preventive measures have been suggested to further improve the environmental conditions and to prevent the exposure of workers.

The side openings provided in the bag opening and cutting system for movement of the pusher should be covered to the maximum extent possible in order to prevent the escape of fibres. Floor cleaning in asbestos handling and processing, pre-forming and finishing areas should be performed with the help of vacuum cleaner or wet mopping. Effective use of dust respirators among the workers engaged should be encouraged. Periodic cleaning of the bag filter of dust collection system should be done.

EDUCATION AND TRAINING

WORKSHOP ON ENVIRONMENTAL AUDIT

INTRODUCTION

Today, Environmental Management issues are receiving increased attention of the industrial establishments across the globe including India. Environmental audit has emerged as an important instrument for establishing and also sustaining Environmental Management System (EMS) at the place of work. Environmental audit has become associated with wide variety of efforts, activities and programmes that are intended to examine the performance of the given facilities of operation and determine or verify the extent to which these activities and programmes comply with external requirements and internal policies.

EMS Audit is a systematic and documented verification process to determine whether organizational EMS conforms to its audit criteria.

IS/ISO 14010-1996 & 14011-1996 have formalized a comprehensive standard for Environmental Safety Audit, which enumerates scope, definitions, procedures, checklist, etc. This standard is in line with international standards. In this context it becomes necessary to propagate the usefulness of the environmental audit with a view to enlighten the industrial establishment to formulate strategies and action plans for establishing Environmental Management Systems.

OBJECTIVES

This programme is intended to achieve the following objectives:

- Give exposure to the participants on the scope of Environmental Audit.
- To enlighten them about the methodology and essential elements of conducting Environmental Audit.
- To equip the participants with skills and strategies to overcome the difficulties experienced during Environmental Audit.

HIGHLIGHTS

- Environment (Protection) Act & Rules, 1986.
- Safety, health and the Environmental Management Systems.
- Emergence of ISO 14000 Standard in India, EMS policy, Planning and implementation.
- Air pollution measurement and control.
- Water pollution management.
- Waste minimization.
- Contaminated land.
- Environmental safety audit – as per IS 14010 & 14011-1996.
- EMS assessment checklist
- Case studies from fertilizer industries, chemical industries and engineering industries.

Conducted by:

**ENVIRONMENTAL ENGINEERING
DIVISION
CENTRAL LABOUR INSTITUTE
N. S. Mankikar Marg
SION, MUMBAI 400 022**

MSDS

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): PHOSPHORIC ACID

HAZARDS IDENTIFICATION

Emergency Overview

DANGER! CORROSIVE. CAUSES SEVERE IRRITATION AND BURNS TO EVERY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED.

POTENTIAL HEALTH EFFECTS

Inhalation: Inhalation is not an expected hazard unless misted or heated to high temperatures. Mist or vapor inhalation can cause irritation to the nose, throat, and upper respiratory tract. Severe exposures can lead to a chemical pneumonitis.

Ingestion: Corrosive. May cause sore throat, abdominal pain, nausea, and severe burns of the mouth, throat, and stomach. Severe exposures can lead to shock, circulatory collapse and death.

Skin Contact: Corrosive. May cause redness, pain and severe skin burns.

Eye Contact: Corrosive. May cause redness, pain, blurred vision, eye burns and may

permanent eye damage.

Chronic Exposure: No information found.

Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or eye problems, or impaired respiratory function may be more susceptible to the effects of the substance.

FIRST AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.

Ingestion: If swallowed, **DO NOT INDUCE VOMITING.** Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.

Eye Contact: Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

FIRE FIGHTING MEASURES

Fire: Not considered to be a fire hazard. Contact with most metals causes formation of flammable and explosive hydrogen gas.

Explosion: Not considered to be an explosion hazard.

Fire Extinguishing Media: Use any means suitable for extinguishing surrounding fire.

MSDS

Water spray may be used to keep fire exposed containers cool. If water is used, use in abundance to control heat and acid build-up.

Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face-piece operated in the pressure demand or other positive pressure mode.

ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth) and place in a chemical waste container. Do not use combustible materials, such as saw - dust. Do not flush to sewer. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities.

HANDLING AND STORAGE

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture, incompatibilities and direct sunlight. Corrosive on mild steel. Store in rubber lined or 316 stainless steel designed container for phosphoric acid. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. Protect

from freezing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):

1 mg/m³ (TWA)

-ACGIH Threshold Limit Value (TLV):

1 mg/m³ (TWA), 3 mg/m³ (STEL)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a full face - piece respirator with high efficiency dust/mist filter may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face-piece positive-pressure, air-supplied respirator.

WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat,

MSDS

apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Stability: Stable under ordinary conditions of use and storage. Substance can super-cool without crystallizing.

Hazardous Decomposition Products: Phosphorus oxides may form when heated to decomposition.

Hazardous Polymerization: Will not occur.

Incompatibilities: Liberates explosive hydrogen gas when reacting with chlorides and stainless steel. Can react violently with sodium tetrahydroborate. Exothermic reactions with aldehydes, amines, amides, alcohols and glycols, azo-compounds, carbamates, esters, caustics, phenols and cresols, ketones, organophosphates, epoxides, explosives, combustible materials, unsaturated halides, and organic peroxides. phosphoric acid forms flammable gases with sulfides, mercaptans, cyanides and aldehydes. It also forms toxic fumes with cyanides, sulfide, fluorides, organic peroxides, and halogenated organics. Mixtures with nitromethane are explosive.

Conditions to Avoid: Incompatibles.

TOXICOLOGICAL INFORMATION

Oral rat LD50: 1530 mg/kg; investigated as a mutagen.

Ingredient	Cancer Lists NTP Carcinogen		IARC Category
	Known	Anticipated	

Phosphoric acid (7664-38-2)	No	No	None
Water (7732-18-5)	No	No	None

ECOLOGICAL INFORMATION

Environmental Fate:

When released into the soil, this material may leach into groundwater.

When released into water, acidity may be readily reduced by natural water hardening minerals. The phosphate, however, may persist indefinitely.

Environmental Toxicity:

No information found.

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.

**INTERNATIONAL OCCUPATIONAL SAFETY AND HEALTH INFORMATION
CENTRE (CIS)**

CIS (from the French name, Centre International d'information de sécurité et d'hygiène 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)
- ILOCIS 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: Pharmaceuticals and worker productivity loss: A critical review of the literature.

**CIS ACCESSION NUMBER
CIS 03-1622**

ABSTRACT

Many chronic illnesses that affect the working population can cause losses in productivity. The extent to which these productivity losses can be reduced by pharmacological treatment is of particular interest to employers, who bear the costs of productivity losses and of employees' health care. This article consists of a summary and critical review of various earlier studies on the effects of pharmaceuticals on productivity losses. For a dozen drug classes, there is good evidence that pharmaceuticals reduce productivity losses caused by respiratory illnesses (such as asthma, allergic disorders, bronchitis, upper respiratory infections and influenza), diabetes, depression, dysmenorrhoea and migraine. In many cases, the reduction in productivity loss may partially or completely offset the costs of treatment. These results should be helpful to occupational physicians in providing recommendations on employer benefit plan designs taking into account the benefits of pharmacological treatments.

Note :

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

ANNOUNCEMENTS

TRAINING PROGRAMMES JANUARY TO MARCH 2007 CENTRAL LABOUR INSTITUTE, SION, MUMBAI-400 022

Programme title	Contact person
Ergonomics – A Tool for Ensuring Safety, Health and Productivity at Work	Director (Physiology) & In-charge Indl. Erg. Division
Workshop on Safe Handling of Chemicals for Safety Committee Members of Hazardous Industries	Director (Indl. Hygiene) & In-charge MAHCA Division
Advanced Diploma in Industrial Safety 2006-07	Director (Safety) & In-charge Safety Division
Training Program on Industrial Safety (For NSC Members Only) Maharashtra Chapter.	Director (Safety) & In-charge Safety Division
Training Program on Impact of Environmental Pollutants and their Control at Workplace	Director (Physiology) & In-charge Env. Engg. Division
Workshop on Safety Audit	Director (Safety) & In-charge Safety Division
Heat Stress and Ventilation – Its Evaluation and Management for Ensuring Safety, Health and Productivity at Work	Director (Physiology) & In-charge Physiology Division
Evaluation of Chemical Hazards and its Control	Director (Indl. Hygiene) & In-charge Indl. Hygiene Division
Effective Participative Skills for Safety Committee Members	Director (Indl. Psychology) & In-charge Indl. Psy. Division
Personal Growth and Group Dynamics (PGGD)	Director (Staff Trg./Prod) & In-charge Staff. Trg. Division
Safety, Health and Environment Management in Chemical Industry	Director (Indl. Hygiene) & In-charge Indl. Hygiene Division
Occupational Physiology, its Application in Industry for Promotion of Safety, Health and Productivity at Work	Director (Physiology) & In-charge Physiology Division
Training Workshop on Hazard and Operability (HAZOP) Studies	Director (Indl. Hygiene) & In-charge MAHCA Division
Workshop for Safety Committee Members	Director (Safety) & In-charge Safety Division

ANNOUNCEMENTS

Training Workshop on Occupational Safety,
Health and Environment – Innovation/Challenges

Director (Safety) &
In-charge Safety Division

**TRAINING PROGRAMMES JANUARY TO MARCH 2007
REGIONAL LABOUR INSTITUTE , NO.1,SARDAR PATEL ROAD
ADYAR, CHENNAI-600 113**

Programme title	Contact person
Safety in Hospital Management	Director In-charge
Seminar for Safety Officers	Director In-charge

**TRAINING PROGRAMMES JANUARY TO MARCH 2007
REGIONAL LABOUR INSTITUTE , LAKE TOWN
KOLKATA-700 089**

Programme title	Contact person
Refresher Course on Occupational Health for Plant Medical Officers	Director In-charge
Techniques of Chemical Safety Management	Director In-charge
Safety, Health and Environment at Work Place	Director In-charge
Chemical Safety for Worker Members of Safety Committee	Director In-charge
Advanced Training Programme on Environmental Hazards and Their Control in Industries	Director In-charge

**TRAINING PROGRAMMES JANUARY TO MARCH 2007
REGIONAL LABOUR INSTITUTE, SARVODAYA NAGAR
KANPUR- 208 005**

Programme title	Contact person
One Month Certificate Course on Safety and Health	Director In-charge
Physical Hazards in Industries	Director In-charge
Chemical Safety	Director In-charge
Advanced Training Programme on Occupational Health	Director In-charge
Workshop on Monitoring of Work Environment	Director In-charge

इंडोशनेट

भारत सरकार का श्रम एवं रोज़गार मंत्रालय व्यवसायिक सुरक्षा और स्वास्थ्य सूचना प्रणाली पर इंडोशनेट नामक राष्ट्रीय नेट वर्क का विकास कर रहा है। श्रम मंत्रालय का एक संबद्ध कार्यालय, कारखाना सलाह सेवा एवं श्रम संस्थान महानिदेशालय इस नेट वर्क प्रणाली के सफल कार्यान्वयन में सहायता देता है। इस नेट वर्क का उद्देश्य व्यवसायिक सुरक्षा और स्वास्थ्य संबंधी राष्ट्रीय जानकारी सुदृढ़ करना और लाभहानि रहित आधार पर इसका आदान-प्रदान करना है ताकि हमारे समग्र सूचना स्रोतों का परस्पर लाभ के लिए उपयोग हो सके। आपस में सूचना या जानकारी की यह सहभागिता केवल राष्ट्रीय स्तर तक ही सीमित नहीं होगी बल्कि इसमें अंतर्राष्ट्रीय स्रोत भी शामिल होंगे। इस जानकारी का आदान-प्रदान ई-मेल के साथ-साथ डाक/कुरियर सेवा द्वारा किया जाएगा। यदि औद्योगिक संगठनों, संस्थानों, उद्योग संघों, मज़दूर संघों, व्यवसायिक निकायों और ग़ैरसरकारी संगठनों के पास व्यवसायिक सुरक्षा स्वास्थ्य संबंधी कोई जानकारी हो और वे राष्ट्रीय और अंतर्राष्ट्रीय स्तर पर उक्त जानकारी बाँटना चाहते हों तो कारखाना सलाह सेवा एवं श्रम संस्थान महानिदेशालय की ओर से इस नेट वर्क के सदस्य के रूप में भाग लेने के लिए उनका स्वागत है। इच्छुक इकाइयों संगठनात्मक रूपरेखा संबंधी प्रोफार्मा के लिए महानिदेशक, कारखाना सलाह सेवा एवं श्रम संस्थान महानिदेशालय, केंद्रीय श्रम संस्थान भवन, एन.एस.मंकीकर मार्ग, सायन, मुंबई-४०० ०२२ से संपर्क करें।

टिप्पणी : जिन इकाइयों ने हमारे पहले आग्रह के संदर्भ में संपर्क किया है और निर्धारित प्रोफार्मा में रूपरेखा भेज दी है, वे दुबारा आवेदन न करें।

नेशनल रेफरल डायग्नोस्टिक सेंटर

भौतिक, रासायनिक, जैविक तथा मनो-सामाजिक जैसे विभिन्न कारणों से कामगारों पर होने वाले विपरीत स्वास्थ्य प्रभावों की रोकथाम और नियंत्रण करने के लिए व्यावसायिक स्वास्थ्य विकार और व्यावसायिक रोगों की शीघ्र पहचान और उसका निदान एक प्रमुख पहलू है। व्यावसायिक रोगों का शीघ्र पता लगाने और निदान करने के लिए केंद्रीय श्रम संस्थान, मुंबई के औद्योगिक चिकित्सा प्रभाग के अधीन 'नेशनल रेफरल डायग्नोस्टिक सेंटर' कार्यरत है जो व्यावसायिक स्वास्थ्य समस्याओं / व्यावसायिक रोगों की रोकथाम / नियंत्रण के लिए आवश्यक उपाय सुझाता है। प्रभावित कामगारों की चिकित्सीय जाँच के लिए यह निदान केंद्र पूर्णतया सज्जित है और यहाँ श्वास/धमनी संबंधी जाँच, श्रव्यता मापन, ई.सी.जी., टिट्मस दृष्टि जाँच, जैविक निगरानी आदि के लिए सुविधाएँ उपलब्ध हैं। कारखाना चिकित्सा अधिकारी, ई.एस.आई. डॉक्टर, कारखानों के चिकित्सा निरीक्षक सहित व्यावसायिक चिकित्सक तथा मेडिकल कॉलेज और अस्पतालों के प्रमाणित शल्य चिकित्सक और डॉक्टर व्यावसायिक रोगों के संदेहास्पद रोगी, निदान और परामर्श के लिए इस केंद्र में भेज सकते हैं। इस मामले में अधिक जानकारी के लिए महानिदेशक, कारखाना सलाह सेवा एवं श्रम संस्थान महानिदेशालय, केंद्रीय श्रम संस्थान भवन, एन.एस.मंकीकर मार्ग, सायन, मुंबई-४०० ०२२ से संपर्क करें।

INDOSHNET

Ministry of Labour & Employment, 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.

'इन्डोश्न्यूज़' एक त्रैमासिक समाचार पत्र है जो व्यावसायिक सुरक्षा और स्वास्थ्य के क्षेत्र में अनुसंधान, अध्ययन और सर्वेक्षण के माध्यम से उपलब्ध जानकारी तथा तत्संबंधी विचार विनिमय में अत्यंत सहायक है। कारखाना सलाह सेवा एवं श्रम संस्थान उन व्यक्तियों, उद्योगों, औद्योगिक संगठनों, मज़दूर संघों और व्यावसायिक निकायों से लेख आमंत्रित करता है जिनके पास व्यावसायिक सुरक्षा एवं स्वास्थ्य संबंधी जानकारी है तथा जो उसे स्वेच्छा से दूसरों में बाँटना चाहते हैं।

१. प्रकाशन के लिए पांडुलिपि की दो प्रतियां 'डबल स्पेस' में ए-४ आकार के कागज़ पर एक ओर टाइप किए गए लेख जो ३ या ४ पृष्ठ से अधिक न हों, मुख्य संपादक के पास भेजी जानी चाहिए। कोई फ़ोटो छापा नहीं जाएगा।
२. प्रकाशन के लिए स्वीकृत पांडुलिपियों में प्रकाशन की दृष्टि से आवश्यक संपादकीय परिवर्तन करने का अधिकार प्रकाशक का है। प्रकाशक बिना कोई कारण बताए लेख का प्रकाशन नहीं भी कर सकता है।
३. लेखक अपने लेख में दिए गए आँकड़े तथा संदर्भ स्वयं सुनिश्चित करने में सावधानी बरतें।

INDOSHNEWS 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.**

भारत सरकार, श्रम एवं रोज़गार मंत्रालय
कारखाना सलाह सेवा एवं श्रम संस्थान महानिदेशालय

कारखाना सलाह सेवा एवं श्रम संस्थान महानिदेशालय (डीजीफासली) भारत सरकार के श्रम एवं रोज़गार मंत्रालय का एक संबद्ध कार्यालय है। कारखानों और गोदी में व्यावसायिक सुरक्षा और स्वास्थ्य संबंधी नीति बनाने के लिए तथा कार्य स्थलों पर कामगारों की सुरक्षा, स्वास्थ्य, दक्षता संबंधी मामलों पर राज्य सरकारों और कारखानों को परामर्श देने की दृष्टि से १९४५ में भारत सरकार के श्रम मंत्रालय के अधीन डीजीफासली की स्थापना की गई थी। यह महानिदेशालय देश के प्रमुख पत्तनों में सुरक्षा एवं स्वास्थ्य संबंधी नियम भी लागू कराता है।

कारखाना सलाह सेवा और श्रम मंत्रालय संस्थान महानिदेशालय इंडीजीफासली के निम्नलिखित अंग हैं:

- मुम्बई स्थित मुख्यालय;
- मुम्बई स्थित केंद्रीय श्रम संस्थान और
- कोलकाता, चेन्नई, फरीदाबाद और कानपुर स्थित क्षेत्रीय श्रम संस्थान।

मुम्बई स्थित केंद्रीय श्रम संस्थान समाजार्थिक प्रयोगशाला के रूप में कार्य करता है और यह मानवीय पहलुओं से संबंधित औद्योगिक विकास के सभी पक्षों के वैज्ञानिक अध्ययन का एक राष्ट्रीय संस्थान है।

पिछले कई वर्षों में केंद्रीय श्रम संस्थान का केवल आकार की दृष्टि से ही नहीं बल्कि महत्ता की दृष्टि से भी विकास हुआ है और इसने राष्ट्रीय तथा अंतर्राष्ट्रीय स्तर पर मान्यता प्राप्त की है। एशिया और पैसिफिक क्षेत्र में व्यावसायिक सुरक्षा और स्वास्थ्य पर सर्वोत्कृष्ट प्रशिक्षण केंद्र के रूप में अंतर्राष्ट्रीय श्रम संगठन ने मान्यता प्रदान की है। यह सीआईएस इअंतर्राष्ट्रीय व्यावसायिक सुरक्षा और स्वास्थ्य सूचना केंद्र टके राष्ट्रीय केंद्र तथा राष्ट्रीय सुरक्षा एवं स्वास्थ्य जोखिम सतर्कता प्रणाली के केंद्र के रूप में कार्य करता है। राष्ट्रीय स्तर पर सरकार को अनुसंधान और प्रशिक्षण सुविधा उपलब्ध कराने और श्रम मंत्रालय के तकनीकी सहायक के रूप में कार्य करने के अलावा यह संस्थान अध्ययन, तकनीकी परामर्श, प्रशिक्षण और सूचना प्रसार के माध्यम से औद्योगिक पत्तन सेक्टर को गहन और बहु-आयामी सेवा उपलब्ध कराता है। इसके अधीन, व्यावसायिक विकारों की शीघ्र पहचान और उसके नियंत्रण और रोकथाम के लिए रेफरल डायग्नोस्टिक सेंटर कार्यरत है। सुरक्षा और स्वास्थ्य से संबंधित स्तरीय यू-मैटिक वीडियो फ़िल्मों के निर्माण के लिए परिष्कृत उपकरणों से सज्जित एक आधुनिक ऑडियो विजुअल स्टूडियो उपलब्ध है। केंद्रीय श्रम संस्थान के लघु रूप में क्षेत्रीय श्रम संस्थान हैं जो अपने संबद्ध क्षेत्रों की आवश्यकता पूरी करते हैं।

निरंतर बढ़ती माँग को देखते हुए, इस संगठन का आगे विकास हो रहा है। किसी विकासशील देश में विभिन्न और जटिल प्रकृति के उद्योगों की बड़ी संख्या को देखते हुए, कामगारों की सुरक्षा और स्वास्थ्य एक चुनौतीपूर्ण कार्य है। तकनीक, औद्योगिक समाज की साख और समर्पित कर्मचारियों से सज्जित यह संगठन भविष्य की चुनौतियों का सामना करने में सक्षम है। कार्य स्थल सुरक्षित बनाने के अपने लक्ष्य के लिए यह संगठन प्रतिबद्ध है।

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**GOVERNMENT OF INDIA, MINISTRY OF LABOUR & EMPLOYMENT
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 & Employment Government of India. DGFASLI organization 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 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 organization 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 organization is well prepared to meet the challenges of tomorrow. It is committed to the goal of making the workplace safer.





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कारखाना सलाह सेवा और श्रम संस्थान महानिदेशालय के
अधिष्ठान

ESTABLISHMENTS OF DIRECTORATE GENERAL FACTORY ADVICE SERVICE &
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|---|---|
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Central Labour Institute |
|  | क्षेत्रीय श्रम संस्थान
Regional Labour Institute |
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Inspectorates Dock Safety |