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Contents

FROM THE DESK

As we have come to the end of the century, it is time that we take a stock of the situation prevailing in the area of safety and health at workplace. At the national level, some very important steps like amendments to the Factories Act, promulgation of MSIHC Rules, a new Dock Workers (Safety, Health and Welfare) Act, 1986 and Rules thereunder and similar such provisions have been made. The Government both at the Central and State level have shown keen interest and have taken positive steps to see to it that the status of safety and health at workplace makes a quantum jump. In our small way, we in DGFASLI have also tried our best to translate Government policy into practice. The INDOSHNEWS, a vehicle for taking information to the door step of the users has completed four years of its publication. During this period, we have tried to incorporate as much information as possible within the limited resources. I hope that readers have been benefited by our efforts and will continue to support us in our endeavour to improve quality of the Newsletter.

In this issue, the second part of the article on heat stress is being published. Other regular features are also there. We invite suggestions for making the newsletter more informative and useful.

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

HEAT STRESS IN INDUSTRY, Part II

Dr. S.K.Sensarma

HEAT STRESS INDICES

In order to assess the total heat stress imposed on man by any working environment, an integrated approach evaluating both the climatic and non-climatic factors is imperative. This is in fact based on several factors which are likely to influence the heat-exchange between man and his environment. In view of this many heat stress indices have been evolved from time to time. These are in the form of either designing instruments which act as integrating mimics of human body or developing formulae or nomograms to estimate the stress inflicted by a wide range or conditions of work and climate or quantify the physiological strain in response to these stresses. The common heat stress indices which are mostly used for the assessment of the thermal environment are as follows:

- Effective Temperature and Corrected Effective Temperature (E.T. & C.E.T.)
- Wet bulb temperature (WBGT)
- Oxford index
- Predicted - 4 hourly sweat rate (P4SR)
- Belding – Hatch Index (HIS)

Effective and Corrected Effective Temperature (ET/CET) Scales:

'Effective temperature' (ET) is a sensory scale of warmth, compiled from the readings of dry & wet bulb temperature and air velocity from temperature and air velocity from standard nomogram. The temperature thus arrived at corresponds to temperature of still air saturated with water vapour which is supposed to give the same sensation of warmth as that experienced in the environment in question, meaning thereby that if an individual is hypothetically exposed to this temperature under 100% RH and with still air movement, the exposed individual will have the same sensation of discomfort as he is experiencing under the environmental conditions actually recorded.

In situations where there is radiant heat source, the black globe temperature is considered instead of dry bulb temperature and the scale thus, constructed is Corrected Effective Temperature' (CET).

The ET/CET scales are modified depending upon the amount of clothing worn by the individuals such as 'Normal Scale' and 'Basic Scale' which, can be constructed from two different nomograms. The 'basic' scale refers to 'men stripped to the waist' and 'normal' to 'men who are fully clad in indoor clothing'.

The measurement could be made by connecting the air temperature (DBT) or Globe-thermometer temperature (in case it is more that DBT) and the wet-bulb temperature and noting the point at which this line intersects the family of curves running diagonally upwards from left to right at the appropriate air-velocity.

The scales are simple and widely used. However, the scales are satisfactory only in mild heat stress provided that there is a circumscribed range of relative humidity. For climate having relative humidity of less than 40%, the scales cannot be used. Moreover, the scales exaggerate the effects of high dry-bulb temperatures in air movement of upto 3.5 m/sec. and underestimate the deleterious impact of low air-movement in hot and humid environment. It is well known that widely different climates having same ET/CET values do not impose the same physiological strain. Further more, the scales do not provide any allowance for different rates of energy expenditure.

Oxford Index

This index of heat stress has been devised to assess the severity of hot humid conditions of the working place particularly where the ventilation is poor. This has been expressed by a simple weighting as follows:

$$WD = 0.15\ d + 0.85\ w,$$

Where WD = Weighted value, d & w are dry and wet bulb temperature respectively.

Predicted Four Hourly Sweat Rate (P_4SR)

This index is based on the assumption of the amount of sweat that would be perspired by a physically fit and acclimatized young man in the condition under review cover a period of four hours. It takes into account the 'metabolic level' and 'type of clothing' in addition to the climatic factors, unlike other indices mentioned earlier. But this has the drawback of the cumbersome nomograms are to be referred to, and thus lacks which is essential in a practical situation.

Since the physical activity level on the shop floor will remain almost constant, we may make use of the simple indices like CET/ET or WBGT in our control programme.

It is thus evident that the heat stress indices like ET/CET, P_4SR, Oxford index, etc. even though regarded as the useful indices for the evaluation of stress have inherent shortcomings and limitations. As a matter of fact some of them require expensive equipment and/or are difficult to determine in industrial work. An index which has received much attention in recent years, and has been officially adopted by some countries, is the 'Wet Bulb-Globe Temperature Index'. It also has limitations,
but has the definite advantages of being very easy to determine and of requiring simple and inexpensive equipment.

Wet Bulb Globe Temperature (WBGT) Index

It embraces in a single value the effect of 'radiation' 'ambient air temperature' and 'humidity'. It is the weighted value of wet and dry bulb temperature and globe

thermometer readings, calculated using temperature measurements alone, thereby eliminating the need to measure air velocity.

The wet bulb-globe temperature index, was initially developed to provide a simple method for the assessment of heat stress among the military personnel. The basis for this index is that the Wet Bulb-Globe Temperature (representing the environmental heat load) is combined with the work load (representing the metabolic heat load) by plotting the values of both parameters on a co-ordinate system and evaluating the resulting points in relation to curves established according to the concept of prescribed zone, as described by Lind. For continuous exposure over 8 hours, the limiting curve is the 'Upper Limit of the Prescriptive Zone (ULPZ) Line'. This curve is such that it represents the upper limit for combinations of environmental conditions and work loads that do not cause an increase in the core temperature to above 38°C in 95% of average acclimatized individuals. In the 'Prescriptive Zone' the deep-body temperature is determined only by the workload (physical activity) and is practically independent from the environment, while in the 'Environmental Driven Zone' the deep body temperature becomes sensitive to small changes in environmental climatic conditions.

Equipment : The instruments required for the determination of the WBGT are:

- Dry-Bulb Thermometer (for measurements outdoors in sun shine only). - t_a
- Globe Thermometer. - t_a
- Natural wet bulb thermometer. – t_n.wb.

One of the advantages is that it excludes the use of anemometers and eliminates the problem of obtaining average air velocities (which is not very practical in some situations).

Natural wet bulb thermometer (t_n.wb)

This instrument consists of a mercury-in-

glass thermometer, whose bulb is covered by a highly absorbent fabric wick, woven cotton being the most suitable. A recommended range for the thermometer is –5°C to 50°C, with 0.5°C graduations. The accuracy should be at least ± 0.5°C. The wick extends over the stem of the thermometer about one additional bulb length (or about 3 cm) and it must be long enough so that (a) its other end can be immersed in distilled water, which is kept in a container underneath, and (b) about 2.5 cm of wetted wick remain exposed to the air (between the top of the container and the bottom of the bulb).

During the operation, the wick must be kept wet to its top, which is usually achieved by keeping its loose end in the distilled water. However, under too hot and/or too dry conditions, this may become difficult and additional wetting of the wick may be required (by means, for example, of a washing bottle or similar).

The 'natural' wet bulb thermometer' is exposed to natural air movement. Contrary to the 'set-bulb thermometer' there is no artificial air movement over its bulb. Also, the natural wet bulb thermometer is not shielded from radiant heat.

Procedure: The steps to be followed for the determination of the WBGT are:

- the wick must be thoroughly wetted with distilled water about thirty minutes prior to the measurement. This is

- accomplished by means of a syringe,

- washing bottle of similar container with distilled water.

- the loose end of the wick is kept in touch with the distilled water in the open container, so that it will be kept wet all the time through capillarity. In very hot dry environments, capillarity may not be enough to maintain the wick wet and it tends to become dry. In such situations, it is necessary to wet the wick, at intervals, by means of a syringe or washing bottle containing distilled water.

  The natural wet bulb thermometer is then placed in a vertical position, at the measuring point, as well as the globe thermometer.

- For outdoor measurements, a dry bulb thermometer is require, in which case a shield must be provided to protect its bulb against sun or other eventual infrared radiation sources. (The natural wet bulb thermometer is unshielded against radiation).

- When the reading of the natural wet bulb thermometer stabilizes, which usually takes about 25 minutes, it gives the natural wet bulb temperature $t_n$wb.

- When the reading of the globe thermometer stabilizes (in about 20-25 minutes) it gives the globe temperature, t_g. If a dry bulb thermometer is used, its reading, when stabilized, gives the air temperature t_a.

- The WBGT can then be calculated, through an equation.

As a guideline for estimating the time required for a survey, it should be kept in mind that, for each set of measurements, at least 30 minutes are necessary. Therefore, under the best conditions and assuming that distances between sampling sites are not great, a maximum of 15 or 16 determinations

can be expected to be carried out during 8 hour working day, for each set of instruments.

Recommendations :

- the thermometer must be kept in a vertical position
- the wick for the natural wet bulb thermometer must be kept clean, and should be changed and washed, as necessary.
- there should be no restriction to the air flow around the bulb.

Fundamental Equation:

$WBGT = 0.7\ t_{nwb} + 0.3\ (t_g – t_a)$

Where
t_{nwb} = natural wet bulb temperature

t_g = globe temperature

t_a = dry bulb temperature

a) For outdoor exposures with solar load

Minard has proposed a simplified formula which has been adopted, for instance, by the American Conference of Governmental Industrial Hygienists (Threshold Limit Values) as follows:

$WBGT = t_{nwb} + 0.2\ t_g + 0.1\ t_a$

b) Indoor exposures or outdoor exposures with no solar load

$WBGT = 0.7\ t_{nwb} + 0.3\ t_g$

c) Time weighted average WBGT ($WBGT_{twa}$)

When environmental conditions vary significantly, or the workers move through places and jobs that cause different levels of heat stress, a time weighted average WBGT

should be calculated as follows:

$$WBGT_{twa} = \frac{(WBGT_1)\ t_1 + (WBGT_2)\ t_2 + \ldots\ldots + (WBGT_n)\ t_n}{t_1 + t_2 \ldots\ldots\ldots t_n}$$

$WBGT_1$ = WBGT determined for situation or location 1

$WBGT_n$ = WBGT determined for situation or location n
t_1, t_2 …….t_n = time spent respectively, in location 1,2…..t_n.

Time weighted average WBGT values must be calculated on an hourly basis, if the heat exposure is continuous, and not for an 8-hour period. A very extreme heat exposure for over 1 hour might cause health impairment. An inappreciable exposure for the rest of the shift might bring the calculated time weighted average WBGT to a value even below the permissible level but damage would already have been done to the worker's health. For intermittent heat exposure, this time weighted average can be calculated on a 2 hourly basis.

In some cases, where the worker is exposed to a wide and variable range of environmental conditions, it may be very difficult to determine a meaningful time weighted average WBGT.

Permissible Heat Exposure:

The permissible heat exposure threshold limit values recommended for use in the United States are given in the following table :

Permissible heat exposure threshold limit values

(Values are given in ^{o} C WBGT)

	Workload		
Work – Rest regimen	Light	Mode-rate	Heavy

Continuous work	30.0	26.7	25.0
75% work	30.6		
25% rest	30.6	28.0	25.9
each hour			
50% work	31.4		
50% rest	31.4	29.4	27.9
each hour			
25% work			
75% rest	32.2	31.1	30.0
each hour			

CONCLUSION

The determination of the WBGT index is very simple and relatively inexpensive. The items of equipment required are usually found on the market. Auxiliary personnel can be trained to carry out the measurements but must be supervised by an experienced professional.

CONTROL

Legal Provisions:
Recalling the importance of the problems arising out of the industrial heat, and its relevance to health and safety consequences

of the workmen in the industry, the section 13 of the Factories Act, 1948 (modified upto 1987) interalia states that " Effective and suitable provision shall be made in every factory for securing and maintaining in every work-room (a) adequate ventilation by the circulation of fresh air, and (b) such a temperature as will secure to workers therein reasonable conditions of comfort and prevent injury to health".

Model Rule 22 prescribed under the section 13 on 'Ventilation and Temperature' stipulated that in any factory the maximum wet-bulb temperature of air in a work-room at a height of 1.5 meters above the floor level shall not exceed 30^{o}C and adequate air movement of at least 30 meters per minute shall be provided, and in relation to dry bulb temperature, wet bulb temperature in the work-room at the said height shall not exceed that shown in the schedule detailed below:

Dry-Bulb Temperature	Wet-Bulb Temperature
30^{o} - 34^{o}C	29^{o}C
35^{o} – 39^{o}C	28.5^{o}C
40^{o} – 44^{o}C	28^{o}C
45^{o} – 47^{o}C	27.5^{o}C

This means to be adopted under above provisions call for the following measures that:

(i) walls and roof should be of such materials which will prevent undue rise in temperature.

(ii) the processes responsible for production of excessive industrial heat should be as far as possible segregated from other departments.

(iii) the hot surface should be insulated.

(iv) Methods such as white-washing, spraying or insulating and screening the outside walls, etc. raising the level of the roof, or insulating the roof either by providing double-roofing or by the use of insulating roof-materials should be introduced.

Scientific Measures:

When the environmental temperature is beyond the permissible limits, certain control measures need to be taken to improve the working conditions for optimizing efficiency and productivity. The following are a few of them:

Use of suitable thermal barriers:

When it is difficult to control the process-temperature at source due to operational requirement, the best method that could be visualized is the use of some suitable thermal barriers between the heat source and the workers to cut down the radiant heat.

Findings of a scientific study in an engineering plant in U.K. have shown that the globe temperature readings could be brought down from 71.7°C to 43,3°C by use of some reflective shielding made of aluminium sheet metal coated with aluminium paint. A recent study in a Railway Smith shop in India reported remarkable reduction in radiant heat load by 40 to 50 percent and the physiological strain by around 30 percent when 'Calcium Silicate-insulation block' was used.

Personal Protective Clothing:

The use of personal protective clothing seems to be last resort for providing comfort to the workmen as there is hardly any suitable protective clothing for the tropical workers.

Findings of a recent study in forging-units in Western India reported favourable results while 'Aluminium Fabrics-suit' was used by the Furnace workers. The physiological strain was reduced by 50%.

Reduction of Metabolic Workload:

Since the physical work adds to the problem of heat stress, any manual task, particularly of severe nature, should always be avoided, if possible, by adoption of partial mechanisation. Scientific studies have reported considerable reduction in cardio-vascular strain among the workers after introduction of partial mechanization in some tasks.

Provision of Air-conditioned Rest Room:

A satisfactory recovery can be observed when the rest is taken in a comfortable place after the cessation of work in heat. Findings of a study in an aluminium company in Canada revealed that both cardio-vascular strain and body temperature remained well within the limits of safety, when the rest was taken to the comfortable rest-rooms.

Provision of Cold Drinking Water:

The workers should be educated and advised to take plenty of cold water very frequently to replenish the fluid loss due to heavy sweating during work in heat. Provision should, there, be made for easy availability of cold water very close to shopfloors.

Selection Criteria:

The heat stress is likely to impose undue stress on the cardio-vascular system and thus workers with strong body build and high levels of physical fitness should be selected for hot operations. Persons reported to be suffering any cardiac diseases should be avoided for hot-tasks.

Findings of a study in a steel mill in 1970s' in USA gave fairly established the correlation between the 'physical fitness levels' and 'heat tolerance limits'. Performance decrement was reported more among the workers with relatively low levels of fitness than those with high degree of fitness.

Periodical Check-up:

Frequent periodical check-up is also necessary to assess the physical fitness levels of individuals exposed to hot environments to ensure whether they are still fit to work under such environment.

HAZARD & OPERABILITY STUDY IN A CHEMICAL PLANT

An Hazard & Operability (HAZOP) study was carried out in a factory engaged in the manufacture of Calcium Alkyl Benzene Sulphonate (CABS) which is used as an emulsifier in the pesticides formulation. The raw materials used are: Linear Alkyl Benzene Sulphonate (LABS), Normal Butyl Alcohol(n-BA),Lime,C-9(Mixture of organic solvents) and Nonyl Phenol (NP)-13.

METHODOLOGY :

The study was carried out by critically examining the processes and operations and the engineering intentions to assess the hazard potentials due to mal-operation and/or mal-function of the individual items of equipments/components available in the various sections. During the study the operations/sections like unloading of raw materials from road tankers, neutralizer, filtration of neutralized slurry, transfer of filter to the reactor, distillation unit, mixing operations etc., were critically examined.

FINDINGS

The possible causes of deviations from the normal operating conditions, the consequence of each deviation, safety measures available in the plant and the additional safety measures required to control or contain the hazards were discussed in depth by the study team and recorded in the formats.

RECOMMENDATIONS

A total of 45 recommendations were made to strengthen the safety system in the plant. Some of the recommendations were: preparation of safe operating procedures (SOP), operating the plant as per the SOP, inspection and checking of pipelines, preparation of emergency plan, provision of wheel choke to the road tanker, constructions of dyke wall around the storage tank, display of precautionary notices provision for level monitoring devices etc.

ENVIRONMENTAL-CUM-OCCUPATIONAL HEALTH STUDY IN A ASBESTOS UNIT

An Environmental study was carried out in an unit engaged in manufacture of the brake linings for automobiles to find out the level of asbestos fibres in the work environment and to suggest suitable remedial measures wherever required. Manufacturing of brake lining involves various processes like bag opening, weighing, performing, baking in ovens, inner diameter grinding, outer diameter grinding etc. During the above said processes the asbestos fibres are likely to get released into the working environment. The plant is provided with a large number of windows and ventilators. Independent Local exhaust systems are provided for different operations. The workers engaged in various operations were provided with personal protective equipment like dust masks, nose pads, goggles, safety shoes, cotton, gloves, heat resistant coir gloves etc.

METHODOLOGY

Samples of airborne asbestos fibres were collected in membrane filters (0.8 micron pore size and 25 mm dia) with the help of personal samples at the rate of 1 lpm. The samples were the processed and counted under Phase Contrast Microscope (Metzer Trinocular Phase Constrast Microscope).

FINDINGS

The concentrations of the asbestos fibres collected at various locations were all well within the permissible level of exposure i.e. 2 fibres/cc.

SELECTION CRITERIA OF INDUSTRIAL MANPOWER

Selection Criteria of industrial workers is of paramount importance for increasing productivity, safety and health of the industrial workers. Selection process based on personal interview and written examination often do not estimate human performance capacity, thus a misplace of industrial worker always happens in shop floor. To place the right man for the right job scientific criteria is absolutely essential. The physical and physiological consideration of human beings at work in relation to his working environment is absolutely essential to have higher industrial productivity. Selection of industrial worker through the principle of physiological test is always beneficial to both employees and employers. Considering these factors, this training programme has been designed to expose the managers and middle management level of executives, for better performance safety and health of workers.

OBJECTIVE:

To familiarise with :

* Different physiological techniques to assess human performance capacity.

* Effect of environmental and physical workload on selection criteria of industrial workers.

* Effect of interindividual difference and finding out of remedial procedure for such differences.

PARTICIPANTS:

Industrial engineers, Plant Medical Officers, Safety professionals, Production Engineers etc.

DURATION : 5-Days
Conducted by Industrial Physiology Division, CLI, Mumbai

SAFETY ENGINEERING AND MANAGEMENT

Due to the growth of "Technology driven" market, Engineering/Manufacturing industry is subjected to a heavy competition in respect of products, price and quality. It is the "knowledge push and need pull" which makes the industrial situation more serious in terms of investment and employment. Serious industrial accidents are associated with hazardous conditions prevailing in work places which are responsible for injuries, occupational health disorders and loss of property. The management is responsible to provide a safe work place and work environment to its workers. Keeping in view this responsibility, this specialised training programme is designed.

CONTENTS

* Principles of Safety Management
* Important provisions under the Factories Act 1948 and MSHIC Rules
* Machine guarding
* Material handling
* Physical working environment
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* Personal Protective Equipment
* Industrial Hygiene
* Ergonomics for Safety and Health
* Heat Stress
* Motivation for Safety
* I.S.O- 9000 and Total Quality Management
* I.S.O - 14000
* Safety Audit

PARTICIPANTS:

Middle Management personnel from production, maintenance, safety, quality and purchase department of manufacturing sector and ports.

DURATION : 4-Days
Conducted by Industrial Safety Division, CLI, Mumbai

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: Health and Safety problems associated with long working hours: A review of the current position

CIS ACCESSION NUMBER :
CIS 99-1021

ABSTRACT :

Current evidence relating to the potential effects on health and performance of extensions to the normal working day is reviewed. Several gaps in the literature are identified. Research to date has been restricted to a limited range of health outcomes (mental health, cardiovascular disorders). Other potential effects which are normally associated with stress (gastrointestinal disorders, musculoskeletal disorders, depression of the immune system) have received little attention. Also there have been few systematic investigations of performance effects, and little consideration of the implications of a longer working day on occupational exposure limits. It is concluded that there is sufficient evidence to raise concerns about the risks to health and safety of long working hours. However, more work is required to define the level and nature of those risks. Topics: accidents and productivity; cardiovascular disorders; fatigue; health hazards; hours of work; literature survey; mental disorders; neuropsychic stress; psychological effects; smoking; work capacity; work efficiency.

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

IDENTIFICATION

Product Name(s) : BENZENE

HAZARD IDENTIFICATION

Emergency Overview
Appearance: Colourless liquid
Odour: Sweet odour

Warning Statement:
Danger : Extremely Flammable Liquid And Vapor May Cause Flash Fire
May Cause Dizziness And Drowsiness
May Cause Eye Irritation
Aspiration Hazard If Swallowed -
Can Enter Lungs And Cause Damage
Can Cause Damage To Liver, Kidney, And Blood Forming Organs
Contains Benzene - Cancer Hazard

HMIS		NFPA	
Health	: 2	Health	: 2
Reactivity	: 0	Reactivity	: 0
Flammability	: 3	Flammability	: 3
Special	: -	Special	: -

Potential Health Effects

	Eye	Skin	Inhalation	Ingestion
Primary Route of Exposure	X	X	X	

Effects Of Overexposure

Acute:
Eyes: May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling.

Other than the potential skin irritation effects noted above, acute (short term) adverse
effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long-term effects.

Prolonged, widespread, or repeated skin contact may result in the absorption of potentially harmful amounts of material.

Inhalation: Vapors or mist may cause irritation of the nose and throat. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: May cause abdominal discomfort, nausea, and diarrhoea. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitisation Properties: Unknown.

Chronic: Prolonged and repeated overexposure to benzene may cause headaches, loss of appetite, rapid pulse, fatigue, liver and kidney damage, decreased bone-marrow activity with increased bleeding tendencies, and possible irreversible injury to blood forming organs. Prolonged and repeated overexposure to benzene has been associated with aplastic anaemia and acute myelogenous leukaemia in humans.

Medical Conditions Aggravated by Exposure: Repeated overexposure may aggravate existing liver or kidney disease.
Overexposure may aggravate existing blood disorders, such as anaemia.

Other Remarks: None

LIBRARY AND INFORMATION CENTRE

The Library-cum-Information Centre of Central Labour Institute has unique and rare collection of different kind of publications in the field of Occupational Safety, Health, Management and allied subjects. It also has a good collection of different standards, codes, regulations on these matters. In the current year the centre is subscribing to 28 Indian & foreign journals, besides receiving complimentary copies of different periodicals from all over the world. The centre provides facilities for study and research and at the same time supplies authentic and up-to-date information on Occupational Safety, Health and Management. It also extends reading facilities to students & scholars attending different training programmes & courses conducted by CLI. From January 1999 till date a number of publications in the field of OS&H have been added to Library. Some of them are :

MANUAL OF PRACTICAL AUDIO-METRY

Publisher: Whurr Publishers Ltd, London

The aim of this book is to explain the purpose of using certain methods, the factors which may influence the outcome of the test and what results can be expected from test subjects with different types of hearing impairment.

The book starts with four general chapters, of which the first presents the aspects of safety in audiometry. This concerns both electrical hazards for the tester and the test subject as well as acoustic hazards for the test subject. A basic chapter on psychoacoustics is well motivated by the large number of psychoacoustic test methods in use in audiometry. Statistical aspects on test accuracy and a discussion of general sources of error in audiometry also belong to these introductory chapters. In Chapter 5-9, the five main categories of audiometric test methods, presented in volume 1, are discussed: psychoacoustic test methods using pure-tone stimulation and using speech stimulation, audiometry with children, acoustic impedance audiometry and electrophysiological tests. Within each chapter the following are discussed: the indications for the method, the physiological, psychoacoustic and acoustic background for the test method, equipment necessary, sources of error and test accuracy, and the clinical interpretation of the test results. In the five concluding chapters, various applications of audiometry are presented: clinical diagnostic evaluation, audiometric testing of school-children, occupational health, the fitting of hearing aids and evaluation of tinnitus.

HAZARDOUS AND TOXIC MATERIALS

Publisher: A Wiley-Interscience Publication, John Wiley & Sons, New York .

The growing awareness and uneasiness of the public sector about hazardous and toxic chemicals and related materials has created a strong determination by legislators at national, state and local levels to attempt to control these chemicals by laws and regulations. This volume, documents the new developments and to provide sensible, balanced information that will be useful to the makers, users, and disposers of chemicals, which includes nearly every person on planet Earth today. This volume combines the wisdom of several experts in various fields, all presenting a positive view point that hazardous and toxic chemicals and related materials can be controlled and disposed of without adverse effects on people, the environment, or future generations.

ILO TO HELP IN TRAINING RETRENCHED EMPLOYEES

The International Labour Organisation (ILO) will assist the State in conducting training programmes for retrenched employees and those who have availed themselves of Voluntary Retirement Scheme, Ms. Mary Johnson, Director, ILO, Area Office, New Delhi, has said. She was responding to a request for equipping such employees with skills that could get them jobs, by Mr. C. Valliappan, President, Employers' Federation of Southern India. Ms. Johnson also assured the State's Labour Minister, Mr. A. Rehman Khan, that she would speak to the Italian Ambassador regarding his interest to initiate an ILO assisted novel child labour eradication programme at Vellore.

The Minister, Mr. Rehman Khan, detailed the efforts taken by the State in eradication of child labour. He said the State proposed to ask the Centre to accord priority to the families of former child labourers in rural welfare schemes. In the liberalised scenario, employment in the traditional employment was shrinking and opportunities were available in service and IT sectors, Mr. Valliappan said. The change warranted a highly educated and trained work force and it was obligatory on the part of both the industry and the government to retrain their labour force to match the requirements.

Source : The Hindu

DISASTER MANAGEMENT SCHEME FOR CHEMICAL INDUSTRIES IN STATE

The Maharashtra State Chief Secretary today said the Maharashtra Government has meticulously planned and implemented a special disaster management scheme for dangerous chemical industries functioning in the State. The scheme, he said, would promote the vital chemical industry in Maharashtra and at the same time, would ensure safety of Industrial workers as well as citizens residing in areas surrounding any major chemical plant. He was addressing a gathering of officials of Union Ministry of Environment and Forest, State Directorate of Industrial Safety and Health, the Confederation of Indian Industries, senior police, fire brigade and civil defence officials as well as senior functionaries from about 100 hazardous chemical factories operational in Maharashtra. The delegates also participated in a day-long workshop on Industrial safety and Chemical emergency Preparedness jointly organised by the Union and State Government. Speaking as the chief guest, he further said, "The State Government has implemented the disaster management scheme for all 335 hazardous chemical plants operational in different parts of Maharashtra. The Government is keen on maintaining a fine control over pollution, care for the environment and avoid serious disasters. The State will ensure safe growth of the important chemical industry. The industrialists should cooperate with the State and respond to various safety norms being enforced here. It is mutual relationship between the two, with the thrust on safety." Special Secretary to Union Environment and Forest Ministry, praised the State for its standing so far as industrial set-up and infrastructure is concerned. "Maharashtra is an industrially developed State which also adheres to strict safety and environment norms. The Union Government is implementing various schemes for Maharashtra with a special thrust on chemical industries for the very reason," he said. Principal Secretary to the State Labour Department responsible for industrial safety, maintained that the Government and industrialists should work in unison to ensure welfare of industrial workers and protection of industries. Others present on the occasion were Joint Secretary to Union Environment and Forest Ministry, various industrial experts and senior officials.

source: The Indian Express

TRAINING PROGRAMMES
JANUARY-MARCH 2000
CENTRAL LABOUR INSTITUTE , SION, MUMBAI - 400 022

Programme Title	Period	Contact Person
Diploma Course in Industrial Safety 1999-2000	01 June, 1999 - 31 March, 2000	Director (Safety) & Incharge Indl. Safety Division
Associate Fellowship of Industrial Health	03 January-31 March, 2000	Director(Medicine) & Incharge Indl.Medicine Division
Evaluation and control of Harmful exposures in chemical operations	10-14 January, 2000	Director (.Hygiene) & Incharge Indl. Hygiene Division
Overused syndrome & Muscular skeletal disorders	10-14 January, 2000	Director(Physiology) & Incharge Indl. Physiology Division
Ergonomics & its application for safety, health & productivity in industry	17-21 January, 2000	Director(Ergonomics) & Incharge Indl.Ergonomics Division
TQM & Business Process Re-engineering	17-21 January,2000	Director(Productivity)& Incharge Productivity Division
Basic Course for Inspectors Jr.Inspectors (less than 2 years Experience)	01-28 February, 2000	Director(Safety) & Incharge Indl. Safety Division
Participative Approach for Safety & Health	01-04 February, 2000	Director(Psychology) & Incharge Indl.Psychology Division
Working environment - its evaluation and control	07-11 February, 2000	Director(Physiology) & Incharge Indl.Physiology Division
Team Building for Health Safety & Welfare at work	14-18 February, 2000	Director(Staff Trg.) & Incharge Staff Training Division
Industrial Heat - Evaluation & Control for higher productivity & safety in industrial workers	21-24 February, 2000	Director(Ergonomics) & Incharge Indl.Ergonomics Division

Announcements

Programme Title	Period	Contact Person
Preparation of Safety Report for MAH Unit	01-02 March, 2000	Director(MAHCA) & Incharge MAHCA Division
Refresher Course for Safety Officers	06-16 March, 2000	Director(Safety) & Incharge Indl.Safety Division
Workshop on Counselling Skills	07-10 March, 2000	Director(Psychology) & Incharge Indl. Psychology Division
Management of Occup. Stress-Techniques for improvement of work & working environment for higher production	13-16 March, 2000	Director(Ergonomics) & Incharge Indl.Ergonomics Division
Safety Committee - Success & Failure	21-23 March, 2000	Director(Safety) & Incharge Indl.Safety Division
Evaluation & Control of hazards in Pesticide Industry	27-31 March, 2000	Director(Hygiene) & Incharge Indl.Hygiene Division
Occupational Back Pain - its evaluation & control	27-31 March, 2000	Director(Physiology) & Incharge Indl.Physiology Division

TRAINING PROGRAMMES
OCTOBER-DECEMBER '99

REGIONAL LABOUR INSTITUTE, SARDAR PATEL ROAD, CHENNAI-600 113

Programme Title	Period	Contact Person
Productivity Techniques for Effective employee participation	11-15 October, 1999	Director Incharge
Management of Work Environment Stresses	26-28 October, 1999	Director Incharge
Major Accident Hazard Control	08-12 November, 1999	Director Incharge

Programme Title	Period	Contact Person
Management of Hazardous Substances	15-19 November, 1999	Director Incharge
Identification, Analysis, Assessment & Control of MAH in Chemical industries	08-14 December, 1999	Director Incharge

TRAINING PROGRAMMES
OCTOBER-DECEMBER '99

REGIONAL LABOUR INSTITUTE, SARVODAYA NAGAR, KANPUR - 208 005

Programme Title	Period	Contact Person
Seminar on Industrial Environment & its control	5th October, 1999	Director Incharge
Specialised Course on Chemical Safety for Safety Officers	11-15 October, 1999	Director Incharge
Workshop on HAZOP	27-29 October, 1999	Director Incharge
Chemical safety for Safety Committee Members	15-19 November, 1999	Director Incharge
Safety Engineering & Management	22-26 November, 1999	Director Incharge
Occupational Health Practices for Nurses	01-03 December, 1999	Director Incharge
Industrial Safety and Health	20-24 December, 1999	Director Incharge

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.

INDOSHNET

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 Calcutta, 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.bom.nic.in

TRAINING PROGRAMMES
OCTOBER '99 -MARCH 2000

REGIONAL LABOUR INSTITUTE, LAKE TOWN, CALCUTTA - 700 089

Programme Title	Period	Contact Person
Refresher Course on Occupational Health	1st & 2nd week of November, 1999	Director Incharge
Advanced Action Oriented Programme on "Safety, Productivity & a Better Place to Work"	3rd week of November, 1999	Director Incharge
Workshop on Monitoring of Work Environment	3rd week of November, 1999	Director Incharge
Major Accident Hazard Control	2nd & 3rd week of December, 1999	Director Incharge
Safety Audit	4th week of December, 1999	Director Incharge
Safety Engineering & Management	1st week of January, 2000	Director Incharge
Evaluation & Control of Gaseous Pollutants in Industries	2nd week of February, 2000	Director Incharge
Chemical Safety for Workers Members of Safety Committee	2nd week of March, 2000	Director Incharge
Advanced Action Oriented Programme on "Safety, Productivity & a Better Place to Work"	3rd week of March, 2000	Director Incharge